

[54] **DETACHABLE AIR CONDITIONING UNIT FOR HEADWEAR**

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[51] Int. Cl. **A42c 5/04**

[58] Field of Search **2/171.3, 7, 8, 185, 199**

[56] **References Cited**

UNITED STATES PATENTS

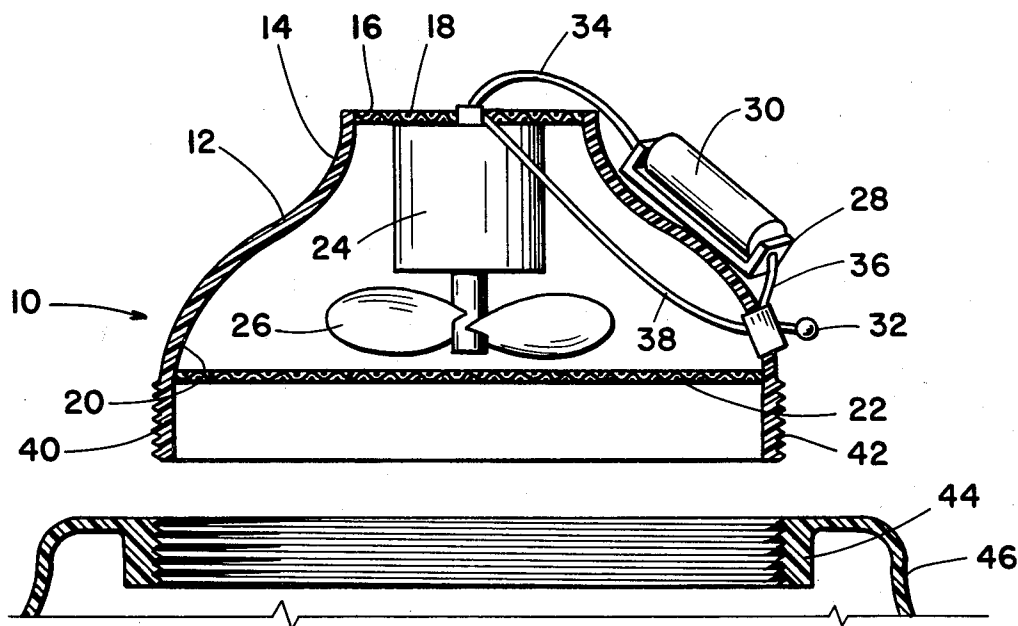
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Primary Examiner—Werner H. Schroeder
Assistant Examiner—Peter Neibum

[57] **ABSTRACT**

A detachable air conditioning unit for headwear of substantially any type comprising an electric motor and fan removably secured within a lightweight housing, said motor being secured to an air inlet screen removably inserted within a recess or aperture provided at the top of the housing, a battery holder supporting a battery electrically connected with the motor, a switch operably connected with the battery and motor for selective actuation of the motor and fan, and a removable temperature control panel, screen, or grid disposed below the fan which functions as a cooling or warming means, said fan being selectively operable by the motor for blowing warm or cool air downwardly onto the wearer of the headwear.

7 Claims, 10 Drawing Figures



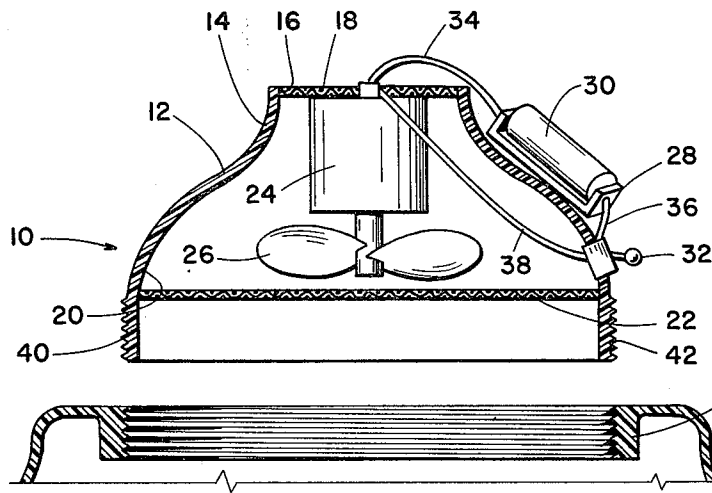


Fig. 1

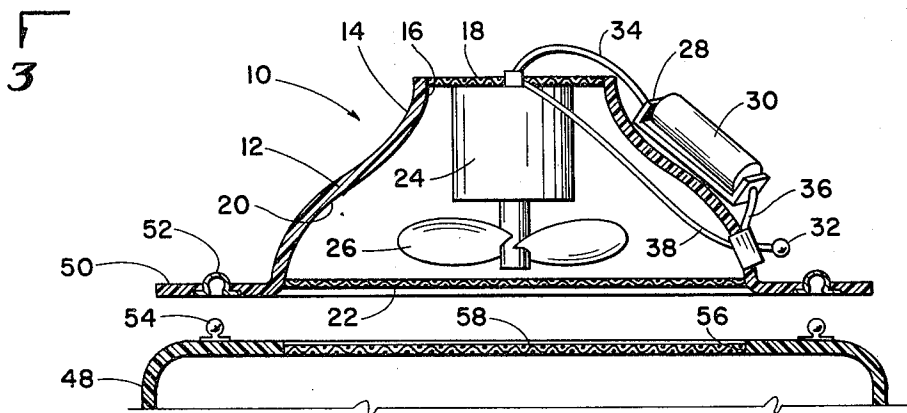


Fig. 2

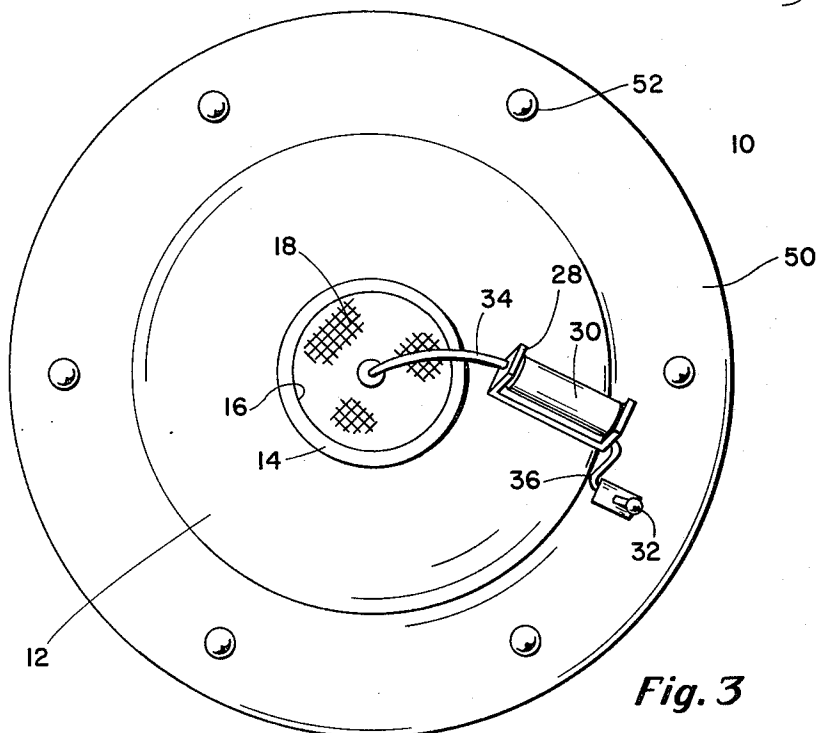


Fig. 3

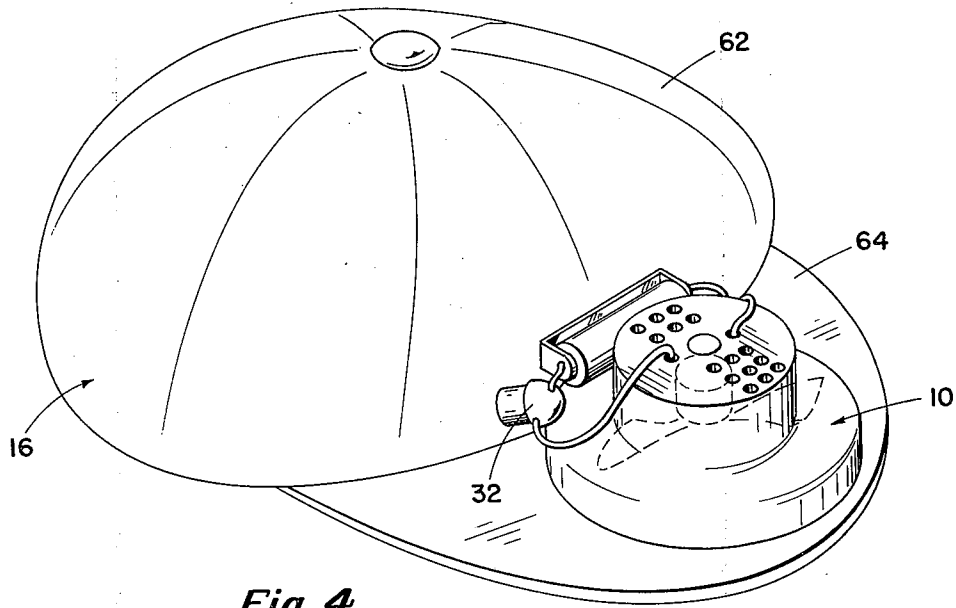


Fig. 4

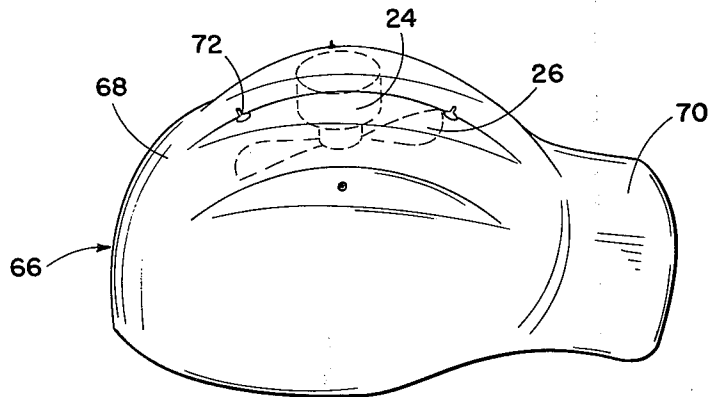


Fig. 5

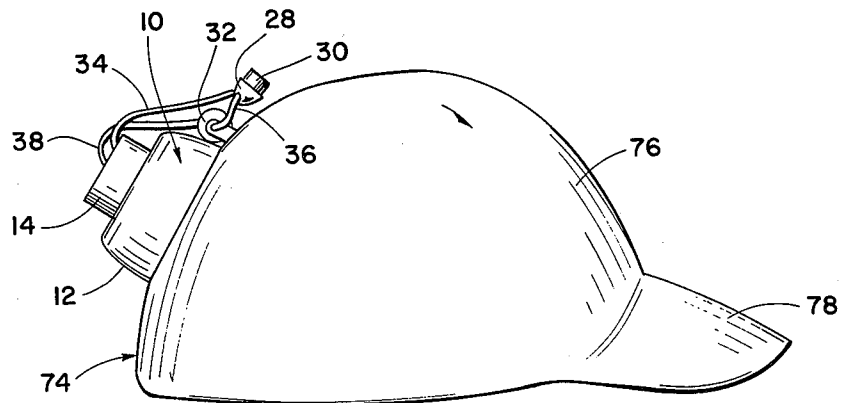


Fig. 6

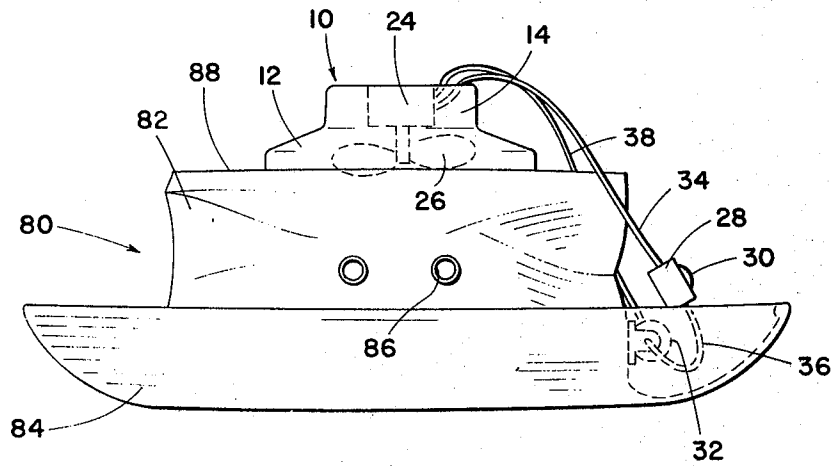


Fig. 7

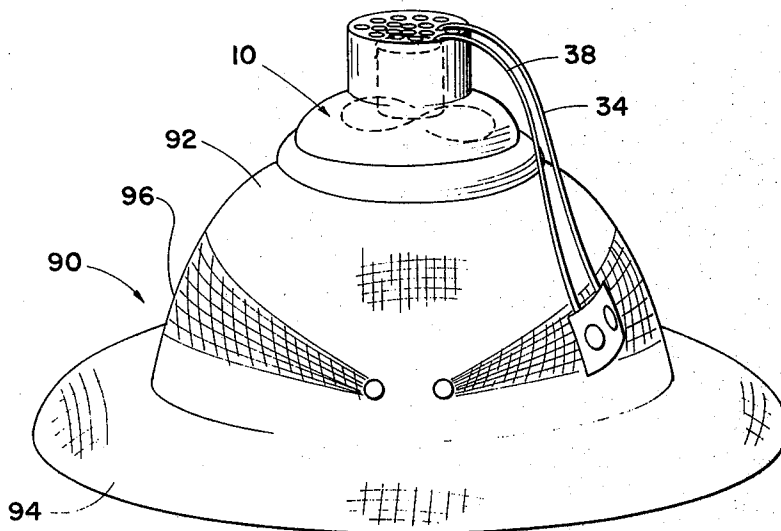
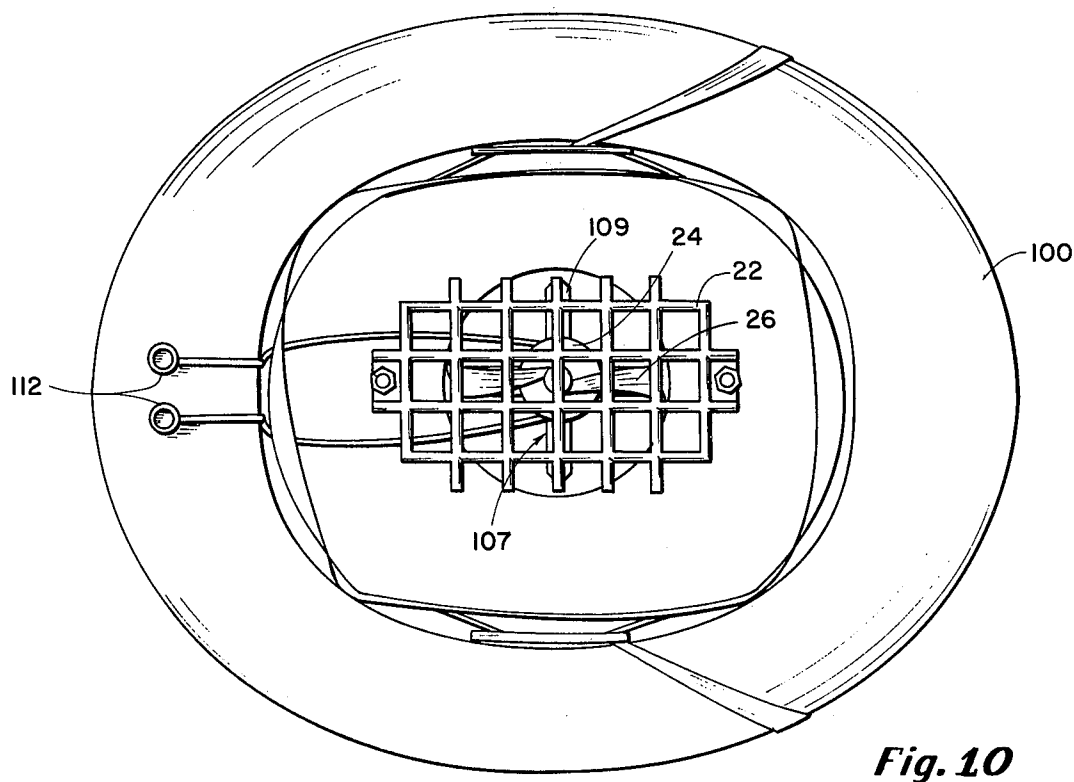
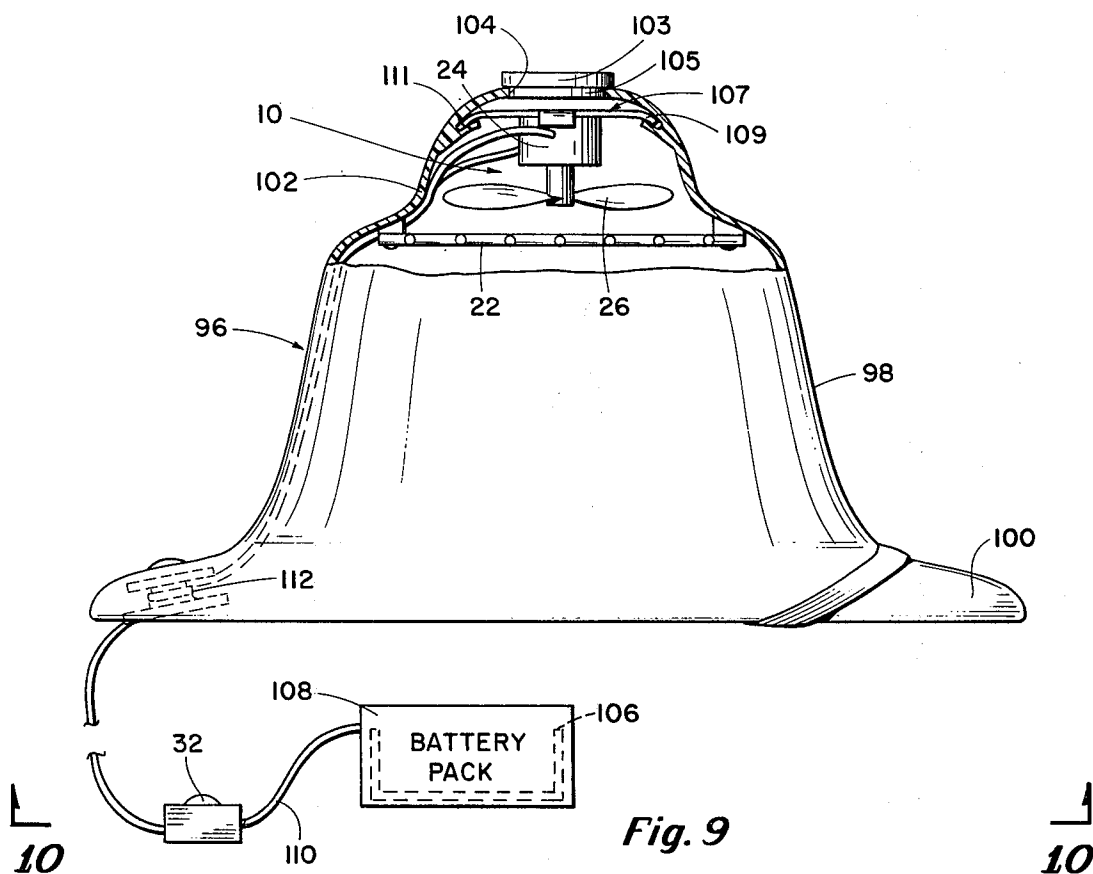


Fig. 8



DETACHABLE AIR CONDITIONING UNIT FOR HEADWEAR

CROSS-REFERENCES TO RELATED APPLICATIONS

This application is related to Patent Disclosure Document No. 006793, filed Sept. 29, 1971; and Patent Disclosure Document No. 006878, filed Oct. 7, 1971.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to improvements in air conditioned headwear, and more particularly, but not by way of limitation, to a removable air conditioning unit for use with substantially any headwear.

2. Description of the Prior Art

Persons spending a considerable amount of time in the out-of-doors, such as workmen, athletes, sports fans, fishermen, and the like, frequently wear head gear to protect themselves from the heat or cold of the surrounding atmosphere. There is an ever increasing demand today for providing the comfort of cooling of the wearer of the head gear during hot weather conditions, or the like, or heating of the wearer during cold weather conditions. Many air conditioned hats, helmets, or the like, have been provided for achieving these end results, such as those shown in the Julius Droz Pat. No. 3,735,423, issued May 29, 1973, and entitled "Hat With Ventilating Means", or my own prior Pat. No. 3,391,407, issued July 9, 1968, and entitled "Helmet", and 3,548,415, issued Dec. 22, 1970, and entitled "Air Conditioned Helmet". These devices have certain disadvantages, however, in that the headwear is provided with permanently installed air conditioning units, and in the event there is no need or desire for using the air conditioning unit, the headwear may be burdensome to wear.

SUMMARY OF THE INVENTION

The present invention contemplates a detachable air conditioning unit particularly designed and constructed for overcoming the foregoing disadvantages, and which may be utilized with substantially all types of headwear. The novel air conditioning unit comprises an electric motor having an impeller or fan carried thereby, and removably disposed within a lightweight housing. The motor is secured to an air inlet screen which is removably inserted within a recess or aperture provided at one end of the housing. A battery holder for receiving or supporting a battery is provided on the housing and the battery is electrically connected with the motor and an electric switch, which is also provided on the housing, and operable to selectively actuate the motor and fan. A removable temperature control panel or grid is provided at the opposite end of the housing spaced from the fan, and functions as a cooling or warming means, in accordance with the requirements of the wearer of the headwear.

The air conditioning unit may be secured to substantially any type of headwear in substantially any desired manner. For example, a threaded air flow vent may be provided in the headwear for threadedly receiving the air conditioning unit housing therein for removably securing the unit to the headwear. A cover plate having complementary threads provided on the outer periphery thereof may be inserted in the air vent at time when

the air conditioning unit is not required. Alternately, complementary gripper elements may be provided on the headwear and the air conditioning unit for removably securing the unit to the headwear. In this instance, a cover member provided with complementary gripper elements may be provided for attachment to the air vent at times when the air conditioning unit is not required. The novel air conditioning unit is of an overall lightweight construction, preferably weighing not more than approximately three ounces, and is simple and efficient in operation and economical and durable in construction.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional elevational view of a detachable air conditioning unit for headwear embodying the invention and depicting one type of connecting means for removably securing the unit to the headwear.

FIG. 2 is a view similar to FIG. 1 and depicts a modified connecting means for removably securing the unit to the headwear.

FIG. 3 is a view taken on line 3—3 of FIG. 2.

FIG. 4 is a perspective view of a cap having a bill member or visor with an air conditioning unit embodying the invention provided thereon.

FIG. 5 is a perspective view of a billed-type or visor-type cap having an air conditioning unit embodying the invention removably secured within the crown thereof as depicted in dotted lines.

FIG. 6 is a perspective view of a billed or visor-type cap having an air conditioning unit embodying the invention secured exteriorly of the crown portion thereof.

FIG. 7 is a side elevational view of another type hat having an air conditioning unit embodying the invention secured thereto.

FIG. 8 is a perspective view of a helmet having an air conditioning unit embodying the invention provided thereon.

FIG. 9 is an elevational view partly in section of a helmet having an air conditioning unit embodying the invention installed therein.

FIG. 10 is a view taken on line 10—10 of FIG. 9.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings in detail, and particularly FIGS. 1, 2 and 3, reference character 10 generally indicates an air conditioning unit for headwear comprising a housing 12 preferably constructed from a lightweight plastic material, but not limited thereto. The housing 12 is preferably of a substantially semi-spherical or generally outwardly flaring configuration having a longitudinally extending neck portion 14 at one end thereof open at 16 for receiving an air inlet screen 18 therein. The air inlet screen 18 may be of a mesh-type construction, a grid member, vented plate, or the like, and is removably secured within the opening 16 in any suitable manner (not shown). The opposite end 20 of the housing 12 is open and a temperature control panel 22 is removably secured therein in any well known manner (not shown), however, it is to be understood that the panel 22 may be permanently installed in the open end 20, if desired. The temperature control panel 22 may be constructed from a suitable mesh-like material, such as a screen, or may be of a grid-type construction, or the like, and functions as either a warming means or

cooling means, depending upon the desired end result for the use of the unit 10. For example, the panel 22 may be a refrigerant gel screen as set forth in my aforementioned patents which cools the air passing there-through upon operation of the unit 10, or alternately, the panel 22 may be a flameless warming screen which heats or warms the air passing therethrough. Of course, the panel 22 may comprise a ventilation screen only, permitting air to flow therethrough during operation of the unit 10 for cooling by ventilation only.

A motor 24 is secured to the air inlet screen 18 in any well known manner (not shown), and is disposed within the housing 12. The motor 24 may be of any suitable type, such as a 1.5 volt motor, and carries a fan 26 which is disposed between the screens 18 and 22. The motor 24 and fan 26 are of a lightweight construction, and preferably weigh, in combination, less than one ounce. In addition, it is preferable that the fan 26 comprise blades made from a soft plastic material whereby the rotation of the blades may be stopped easily and harmlessly with a finger of the user of the unit 10. The fan 26 is rotated by the motor 24 in the usual manner and pulls air into the housing 12 through the air inlet 16 and discharges air from the housing 12 through the temperature control panel or screen 22.

A suitable battery support bracket 28 is secured to the outer periphery of the housing 12 for removably receiving a battery 30 therein. The battery 30 may be of any suitable type as required for supplying power to the motor 24, such as 1.5 volt dry cell battery, but not limited thereto. A suitable electric switch 32 is secured to the housing 12 and extends outwardly therefrom as shown in FIG. 1. The switch 32 may be of any suitable type, such as a toggle switch, push button type, or the like, for ready manipulation by the user of the unit 10 in order to selectively start and stop the operation thereof. The bracket 28 is preferably provided with the usual electrical contacts (not shown) for engagement with the opposite ends of the battery 30, as is well known. One of said electrical contacts is electrically connected with the motor 24 by a lead 34, and the other electrical contact is electrically connected with the switch 32 by a lead 36. The switch 32 is also electrically connected with the battery 30 by a lead 38. Thus, placing of the switch 32 in one position electrically connects the battery 30 with the motor 24 for actuation of the motor, and placing of the switch 32 in another position breaks the electrical connection between the battery 30 and the motor 24 for interrupting the actuation of the motor 24. Of course, the fan 26 is rotated continuously during the activation of the motor 24 for moving air through the housing 12 for discharge thereof through the panel or screen 22.

The air conditioning unit 10 may be removably secured to substantially any type headwear in any well known manner. For example, as shown in FIG. 1, the housing 12 may be provided with an extension sleeve 40 extending longitudinally from the open end 20 thereof. The outer periphery of the sleeve 40 may be threaded as shown at 42 for removable engagement with an internally threaded vent member 44 which may be conveniently provided in the crown, or the like, of a hat 46. The vent member 44 may be constructed from any suitable material, such as a molded lightweight plastic material, and secured to the body of the hat 46 in any well known manner (not shown). When the unit 10 is desired for use in connection with the hat 46, the

sleeve 40 may be threadably secured in the threaded vent 44. When the unit 10 is no longer required for use in connection with the hat 46, the unit 10 may be quickly and easily disengaged from the vent 44, and a complementary cover member (not shown) having a threaded portion complementary with the threaded vent 44 may be secured to the vent for enclosing the opening, and permitting the normal use of the hat 46 without the unit 10 in combination therewith.

Referring to FIGS. 2 and 3, an alternate means of securing the unit 10 to a hat 48 is shown wherein an outwardly extending circumferential flange 50 is provided around the outer periphery of the housing 12 in the proximity of the open end 20 thereof. A plurality of gripper elements 52 are secured to the flange 50 in circumferentially spaced relationship. A plurality of complementary gripping elements 54 are spaced around the crown, or the like, of the hat 48 for engaging the gripper elements 52 in order to removably secure the unit 10 to the hat 48. In addition, an air vent 56 is provided in the crown, or the like, of the hat 48 in substantial alignment with the open end 20 of the housing 12, and a screen 58, or the like, for ventilation, refrigerant cooling, or flameless warming, is suitably secured in the vent 56 for passing air therethrough into the interior of the hat 48. The hat 48 may be used in the normal manner, without the unit 10. However, when it is desired to provide additional cooling or warming for the wearer of the hat 48, the unit 10 may be readily secured thereto by snapping the complementary gripper elements 52 and 54 together in the usual manner. Of course, the unit 10 may be quickly and easily removed from the hat 48 by disengaging the connection between the gripper elements 52 and 54 when it is no longer necessary to provide the additional cooling or warming for the wearer of the hat.

It is to be understood that substantially any well known or desirable means may be provided for removably securing the unit 10 to the headwear, such as Velcro tape, zipper elements, of the like (not shown). In addition, headwear, constructed from soft or flexible materials in the proximity of the desired mounting location for the unit 10 may be reinforced with any desired and well known material for facilitating the installation or attachment of the unit 10 to the headwear.

As hereinbefore set forth, the unit 10 may be utilized in combination with substantially any type headwear. It is to be noted, however, in each instance it is desirable to arrange the unit 10 on the headwear in such a manner that a reservoir of air blowing from the detachable unit 10 moves downwardly onto the head, neck and shoulder of the wearer. The draft of downwardly moving air is useful and advantageous not only for cooling, but also to blow away air pollutants, mosquitoes, flies, insects, and the like, even when the downwardly flowing air is not additionally cooled or warmed by the temperature control panel 22.

By way of example, FIGS. 4 through 10 illustrate typical headwear with which the unit 10 may be efficiently and effectively utilized. FIG. 4 discloses a cap 60 having the crown portion 62 thereof being constructed from a suitable soft or flexible material, such as cotton, or the like, but not limited thereto. A relatively stiff or rigid bill or visor 64 extends outwardly from a portion of the outer periphery of the crown 62 to provide a sunshade for the eyes of the wearer, as is well known. A unit 10 may be removably secured to the bill 64 in any

well known manner, and as hereinbefore set forth, said bill or visor 64 is provided with a suitable vent (not shown) in alignment with the opening 20 of the unit 10. In this embodiment, the switch 32 may be installed or mounted on the crown portion 62 in the proximity of the unit 10 for facilitating manual operation thereof as desired.

FIG. 5 illustrates a cap 66 which is preferably constructed of a stiff or rigid material and includes a relatively rigid crown portion 68 having an integral visor or bill 70 projecting outwardly therefrom for protecting the eyes of the wearer from sun glare. In this type cap, the motor 24 and fan 26 may be mounted interiorly of the crown 68, as shown in dotted lines, and the motor 24 may be suitably secured to a sound-absorbent, flexible support (not shown), such as rubber or the like, which may be secured within the crown by suitable connection members 72, or may be removably inserted into slots (not shown) molded or otherwise formed on the inner periphery of the crown 68. The battery 30 and switch 32 may be either exteriorly or interiorly mounted with respect to the crown portion 68, as desired, and it is important to provide sufficient spacing between the air screen 18 and the inner periphery of the crown portion 68 to permit a free flow of air during operation of the unit 10.

FIG. 6 relates to a cap 74 constructed from a relatively stiff or rigid material and comprising a rigid crown portion 76 having an integral visor or bill 78 provided thereon. A suitable vent (not shown) may be provided in the rear portion or front portion of the crown 76, as desired, and the unit 10 may be removably or detachably secured to the crown portion 76 with the open end 20 thereof in alignment with the vent provided in the crown. When a vent is provided in the front or the rear portion of the crown, it may be desirable to provide at least one additional vent therein for facilitating circulating of air during use of the unit 10. Of course, a suitable cover member (not shown) may be installed in the vent opening or openings in the crown 76 when the unit 10 is not required, as hereinbefore set forth.

FIG. 7 illustrates still another type hat generally indicated at 80 and which preferably is constructed from a suitable soft or flexible material. The hat 80 comprises a relatively soft or flexible material. The hat 80 comprises a relatively soft crown portion 82 having a brim 84 provided therearound, as is well known. This type of hat is usually provided with a plurality of relatively small vent ports as shown at 86. However, when it is found that the ports 86 do not provide sufficient ventilation for comfort of the wearer, a unit 10 may be removably secured thereto in the manner as hereinbefore set forth. For example, the upper portion 88 of the crown 82 may be reinforced with a suitable relatively stiff or more rigid material (not shown) in any well known manner, and a suitable vent (not shown) may be provided in the center of the top portion 88, as hereinbefore set forth. The unit 10 may be removably secured to the top portion 88 in substantial alignment with the vent and may be utilized as desired for adding to the comfort of the wearer. The top portion 88 of the crown 82 may be provided with a threaded vent, as hereinbefore set forth, and a suitable cover may be secured thereto when the unit 10 is removed; or the vent in the portion 88 may be permanently installed ventilation screen similar to that shown at 58 in FIG. 2, and may

be used in the normal manner when the unit 10 is removed from the hat 80.

FIG. 8 depicts still another embodiment wherein a substantially rigid helmet 90 may be of any usual or standard type construction and normally comprises a dome-type crown 92 having a brim 94 provided around the open lower portion thereof. As shown herein, the helmet 90 is of the type particularly designed for female use, and is provided with decorative netting 96, or the like, and the material from which the crown 92 and brim 94 is constructed is a relatively stiff open type or loose-weave appearing material, as indicated in the drawing. The helmet 90, however, may be constructed from a closed-type rigid material, and the decorative features may be eliminated, if desired, since there is no intention of limiting the use of the unit 10 to the particular helmet shown in FIG. 8. A suitable vent (not shown) may be provided in the top of the crown 92, or at any other desired location therein, for removably receiving the unit 10 therein, and additional vents (not shown) may be provided in the crown 92 for facilitating air circulation as hereinbefore set forth. Helmets of this type lend themselves to the installation of an internally threaded vent opening as shown at 44 in FIG. 1, but there is no intention of limiting the use of the unit 10 with this particular type connection element when being installed in the helmet 90. Here again, when the unit 10 is not required, the vent in the crown 92 may be closed by a suitable cover member (not shown) as hereinafter set forth.

FIGS. 9 and 10 illustrate a substantially conventional helmet 96 constructed from a rigid type material and having the usual crown 98 provided with the usual integral brim 100 around the open lower end thereof. The helmet 96 may be further provided with a centrally disposed dome 102 at the top of the crown 98, said dome 102 being of a configuration generally similar to or complementary with the configuration of the housing 12 of the unit 10. An apertured air vent 103 may be suitably rotatably installed or secured to an apertured vent 105 provided in the upper end of the dome 102, and the dome 102 and converging portion of the crown 98 therewith may be utilized in lieu of the housing 12. The motor 24 and fan 26 may be removably secured in the dome 102 spaced from the vent 105 in any suitable manner. For example, as shown herein the motor 24 is supported by a flexible mounting element 107 constructed of rubber, or the like, and comprising a plurality of radially outwardly extending fingers 109 having a central bore (not shown) at the point of the juncture therebetween. The motor 24 is removably mounted within the central bore, which is preferably provided with inwardly directed flexible gripper members (not shown), and the mounting element 107 is removably secured within the dome 102 by insertion of the outer ends or extremities of the fingers 109 in slots 111 provided on the inner periphery of the dome 102. The rotatable vent 103 may be manually orientated with respect to the vent 105 for opening the interior of the dome 102 to the atmosphere, or alternately may be orientated with respect to the vent 105 for closing the interior of the dome 102.

The temperature control panel 22 may be removably or permanently secured at the juncture between the dome 102 and crown 98, as desired, and as shown in FIG. 9, with the motor 24 and fan 26 being mounted within the dome 102 between the vent 103 and panel

22, in the manner as hereinbefore set forth. It is to be noted in this instance it may be preferable to mount the battery 30 and switch 32 on a common bracket 106, or the like, to provide a "power pack" 108 which may be carried in the shirt pocket, or the like, of the wearer. The power pack 108 may be provided with suitable leads 110 for connection with suitable terminals 112, said terminals being mounted on the outer periphery of the helmet 96 and electrically connected with the motor 24 in any well known manner. When the unit 10 is to be activated, it is preferable to open the vents 103 and 105, the power pack 108 may be electrically connected with the motor 24 and fan 26 by connecting the leads 110 with the terminals 112 in the usual or well known manner, and the switch 32 may be utilized for selective actuation of the motor 24 and fan 26. Whereas the unit 10 thus installed or mounted within the dome 102 of the helmet 96 may be removable, it is to be further noted that this installation may be permanent, if desired, and it is considered that the overall outer configuration of the helmet may become well known in the identity thereof as being an air conditioned hat, in the manner in which persons have become accustomed to seeing window-type air conditioners installed in a residence or other building.

Whereas the invention as particularly described herein includes the use of a conventional electric motor, it is to be understood that substantially any other type of power means may be utilized in lieu thereof. For example, solar cells may be secured directly to the crown or other portion of the headwear whereby the surface of the headwear becomes the collector surface for solar energy for use as the power for the unit 10. In addition, the temperature control panel 22 may be removably secured to the unit 10, or may be permanently secured thereto, as desired. Alternately, the temperature control panel 22 may be removably or otherwise secured in the headwear itself rather than in the unit 10, as desired.

It is to be understood that any headwear having a unit 10 in combination therewith may be provided with one or more vents in the crown portion thereof for facilitating the circulation of air during use of the unit 10. The vents may comprise a plurality of relatively small ports, or a lesser number of larger ports, either completely open, or having screen-like inserts, or the like, therein. It is to be further understood that the unit 10 may be removably installed on substantially any type headwear in any desired location thereon, and is not limited to the particular orientation disclosed herein.

From the foregoing it will be apparent that the present invention provides a novel air conditioning unit which may be quickly and easily installed or attached to substantially any type headwear, and may be readily removed therefrom when the use of the unit is no longer desired or necessary. The novel air conditioning unit comprises a housing which may be removably secured to the headwear at substantially any desired position thereon. An air screen is carried by the housing and supports a motor and fan within the housing. A temperature control panel is also carried by the housing in spaced relation to the air screen whereby air is pulled into the housing by the fan and discharged therefrom through the temperature control panel for blowing cooled or warmed air downwardly over the neck, face, and shoulders of the wearer. Power supply means is operably secured to the motor and is provided with

switch means for facilitating the selective operation of the motor and fan by the wearer of the headgear or headwear. The novel air conditioning unit is simple and efficient in operation and economical and durable in construction.

Whereas the present invention has been described in particular relation to the drawings attached hereto, it should be understood that other and further modifications, apart from those shown or suggested herein, may be made within the spirit and scope of this invention.

What is claimed is:

1. A detachable self-contained air conditioning unit for headwear and comprising housing means of a generally outwardly flaring configuration and having the opposite ends thereof open, a first air screen means disposed in one of said open ends, a second air screen means disposed in the other of said open ends, power means carried by said air screen and depending therefrom into the interior of the housing means, impeller means carried by the power means and interposed between the air screen means and temperature control panel means, said impeller means being rotatable by the power means for pulling air into the housing through the air screen means and discharging air from the housing through the temperature control panel means, power supply means operably connected with the power means for selective activation thereof, and securing means cooperating between the housing means and headwear for removably securing the self-contained unit to the headwear, and wherein the housing means includes an upstanding neck portion at one end having an opening therein of a smaller diameter than the opposite open housing end, said air screen means being removably secured in said neck portion opening.

2. A detachable self-contained air conditioning unit for headwear as set forth in claim 1 wherein the securing means comprises complementary threaded means provided on said housing means and said headwear for removably securing the self-contained unit to air conditioning the headwear.

3. A detachable self-contained air conditioning unit for headwear as set forth in claim 1 wherein the securing means comprises complementary gripper means provided on said housing means and headwear for removably securing the self-contained air conditioning unit to the headwear.

4. A detachable self-contained air conditioning unit for headwear as set forth in claim 1 wherein the second air screen means is removably secured in said other open end.

5. A self-contained detachable air conditioning unit for headwear as set forth in claim 1 wherein the securing means comprises pocket means provided on the interior of the headwear, and engagement means provided on the housing for removable connection with the pocket means for removably securing the self-contained detachable air conditioning unit in the headwear.

6. A self-contained detachable air conditioning unit for headwear as set forth in claim 1 wherein the construction of the entire self-contained detachable air conditioning unit is of a weight not exceeding three ounces for facilitating use of the headwear having the self-contained detachable air conditioning unit secured therein.

7. A self-contained detachable air conditioning unit for headwear as set forth in claim 1 wherein the self-contained detachable air conditioning unit is secured within the interior of the headwear in such a manner that the impeller means directs a flow of air directly onto the forehead of the wearer of the headwear.

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