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Description

THIS INVENTION relates to a device for giving, for example to motorists, a visual and/or audible warning of the likelihood of fog or mist.

The occurrence of fog or mist is obviously a hazard affecting travel by road, water or air. Fog or mist occurs when air is fully saturated with water vapour. Any cooling of air saturated with water vapour will result in an excess of water in the air, with the possibility of the excess water being released as dew or mist or fog. In humidity terms this would be at 100% r.h., or dewpoint or saturation point.

As is well known, local variations in air temperature or humidity may lead, in certain weather conditions, to fog occurring in patches, a condition particularly hazardous for motor transport since vehicles moving at high speed in conditions of acceptable visibility may suddenly enter fog patches within which visibility is far less than would be necessary for safe driving so that accidents may well occur before drivers have been able to slow to speeds appropriate to the conditions of poor visibility they suddenly find themselves in.

GB2190203 discloses an electronic device for sensing relative humidity of the atmosphere; for sensing ambient temperature; for calculating the respective dewpoint and for displaying the calculated dewpoint by illuminating a selected light-emitting diode in a row of such light-emitting diodes forming a display of the instrument. The instrument has a respective LED in said display for every C° above or below the dewpoint temperature within a range of such temperatures. The instrument may be used for determining the possibility of the occurrence of fog or mist.

It is an object of the invention to provide an improved device that continuously measures atmospheric humidity and can give an indication when the occurrence of fog is likely.

Whilst it is envisaged that a device embodying the invention will primarily be of utility in road transport, for example in cars and lorries, such a device may also be useful in rail travel or in sea and air travel, where monitoring of weather conditions is generally conducted more carefully and with greater sophistication than in road transport.

An embodiment of the invention is described below by way of example with reference to the accompanying drawings, in which Figures 1a and 1b illustrate, under difference conditions, a display of a device embodying the invention.

Devices embodying the invention comprise a humidity sensor of some sort and an indicator device arranged to provide an indication when the relative humidity of the atmosphere, as sensed by the sensor, is within a given range of saturation.

The measurement of relative humidity can be made in a number of ways. Thus, any of a number of

known types of humidity sensor facility can, in accordance with the invention, be used. It will be understood that the probability of the relative humidity reading 100% within a short time is much higher if the actual relative humidity is over 90%, than if the actual relative humidity is, for example 50%.

The device may, of course, sense some other quantity directly related to relative humidity, such as the dewpoint. Thus it is known that if a polished surface is cooled, dew will appear on that surface at the temperature referred to as the dewpoint (which is the temperature at which the atmosphere in the vicinity of that surface will be fully saturated with water vapour, i.e. will be at 100% r.h.). The difference between the ambient temperature and the dewpoint is, of course, smaller the higher the r.h. of the atmosphere so that this difference is also an indicator of how close conditions are to the occurrence of fog or mist. For example, if the dewpoint is only 1°C lower than the ambient temperature, the likelihood of the air cooling further by 1°C causing fog is great and, indeed, much greater than if the dewpoint temperature was 10°C below the ambient temperature.

Figures 1a and 1b illustrate under different conditions a display of a device embodying the invention and which is arranged to provide a visual indication of the variation in relative humidity, over an extended period, whereby the user of the device can ascertain, at a glance, not only the current relative humidity but also the relative humidity at each of a number of preceding intervals. Accordingly, the user is able to gauge with reasonable accuracy the likelihood that fog will occur within a given time.

By way of example, and referring to Figures 1a and 1b, the display may taken the form of a series of vertically oriented bar displays, e.g. LED bar displays, arranged side by side as illustrated so as to define a graph in which relative humidity is plotted on the Y-axis and time on the X-axis so that the greater the illuminated height of any bar on the chart, the greater the r.h. represented thereby, and so that for example, the bar furthest to the right represents the currently sensed relative humidity, the next bar to the left represents the relative humidity sensed ten minutes ago, the next bar to the left represents the relative humidity sensed twenty minutes ago, and so on. The apparatus is arranged to update the display continually, so that, for example, at the end of each ten minute interval, the previous indication of each bar is transferred to the bar immediately on the left, whilst a freshly sampled r.h. is indicated by the bar on the extreme right. The device is, of course, provided with appropriate electronic processing and memory circuitry to enable it to function in the manner indicated and to store the values of r.h. previously sampled.

The time interval between samples may be selected in accordance with the particular application of the device, so that the time period represented by the

whole chart may be, for example, from one to five hours. The time interval between successive samples of the r.h. may, of course, be substantially less than the time interval represented between adjacent bars of the display, with a consequentially increased memory requirement for the device, so that, for example, whilst each bar is updated once per minute it may take ten successive update cycles for an r.h. value represented in one bar to be represented in the bar immediately to its left.

Considering Figures 1a and 1b, Figure 1a illustrates a situation in which r.h. has been increasing over a period and in which the occurrence of fog is imminent, whereas Figure 1b illustrates a situation in which r.h. has been decreasing over a period and in which the likelihood of fog occurring is decreasing.

The device of Figures 1a and 1b may have some additional visual or audible alarm facility, but need not have such additional alarm facility.

The device may also be arranged, additionally, to measure temperature directly and to apply a "correction factor" to the display, or to the underlying computational process according to the rate of change of temperature. Thus, a rapidly falling temperature implies an increased likelihood of fog occurring, and since it is technically easier to track accurately rapidly changing temperature than rapidly changing relative humidity *per se*, monitoring rate of temperature change may afford an earlier warning of the risk of fog.

Claims

1. A warning device for providing a warning when the relative humidity of the atmosphere is approaching a level at which fog may occur, the device comprising an instrument capable of measuring the relative humidity or an associated quantity and indicator arranged to provide an indication when the relative humidity is within a predetermined range of 100%, characterised in that the device includes an electronic display having a plurality of indicators for respective relative humidity values detected by the device at periods of different lengths from the current time, and storage means for storing the relative humidity values to be displayed by said indicators, said indicators being located physically in a series or row, one of said indicators at the end of said series or row serving to display the most recent relative humidity and each of the preceding indicators in said series or row serving to display the relative humidity measured at a predetermined time before the time at which the relative humidity displayed by the immediately preceding indicator in said row or series was measured, the device including means for updating said display at pre-

terminated intervals at each of which the relative humidity value displayed by each indicator is transferred to the preceding indicator, if any, to be displayed thereby, and said storage means receives an updated most recent relative humidity value for display by said one indicator at said one end of said series.

2. A device according to claim 1 wherein said indicators take the form of bar displays, each adapted to display a bar of a length, measured from a base position of the bar, which corresponds with the relative humidity value displayed by the respective indicator, the bar displays being arranged in said row or series extending in a first direction with said base positions extending in a row in said first direction and with the individual bars extending in a second perpendicular direction away from said base positions, whereby the display takes the form of a graph of relative humidity against time.
3. A device according to claim 2 wherein said bar displays are LED bar displays.

Patentansprüche

1. Warnvorrichtung zum Liefern einer Warnung, wenn sich die relative Feuchtigkeit der Umgebungsluft einem Niveau nähert, bei welchem Nebel auftreten kann, wobei die Vorrichtung ein Instrument, das zum Messen der relativen Feuchtigkeit oder einer damit verbundenen Größe fähig ist, und einen Indikator umfaßt, der angeordnet ist, um eine Angabe zu liefern, wenn die relative Feuchtigkeit innerhalb eines vorherbestimmten Bereichs von 100% liegt, dadurch gekennzeichnet, daß die Vorrichtung eine elektronische Anzeige mit einer Vielzahl von Indikatoren für entsprechende relative Feuchtigkeitswerte, die von der Vorrichtung in Perioden verschiedener Längen von der gegenwärtigen Zeit an erfaßt werden, und Speichermittel zum Speichern der relativen Feuchtigkeitswerte umfaßt, um dieselben durch besagte Indikatoren anzuzeigen, wobei besagte Indikatoren physisch in einer Reihenfolge oder Reihe angeordnet sind, einer besagter Indikatoren an dem Ende besagter Reihenfolge oder Reihe dem Anzeigen der am kürzesten zurückliegenden relativen Feuchtigkeit dient und jeder der folgenden Indikatoren in besagter Reihenfolge oder Reihe dem Anzeigen der relativen Feuchtigkeit dient, die zu einer vorherbestimmten Zeit vor der Zeit gemessen ist, an welcher die relative Feuchtigkeit, die von dem direkt vorangegangenen Indikator in besagter Reihe oder Reihenfolge angezeigt wird, gemessen wurde, wobei

die Vorrichtung Mittel zum Aktualisieren besagter Anzeige in vorherbestimmten Intervallen enthält und in jedem besagter Intervalle der relative Feuchtigkeitswert, der von jedem Indikator angezeigt wird, zu dem vorangegangenen Indikator übermittel wird, wenn vorhanden, um dadurch angezeigt zu werden, und daß besagtes Speichermittel einen aktualisierten, am kürzesten zurückliegenden relativen Feuchtigkeitswert zum Anzeigen durch besagten einen Indikator an besagtem einen Ende besagter Reihenfolge empfängt.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß besagte Indikatoren die Form von Stabanzeigen haben, wobei jeder einen Stab einer Länge anzeigen kann, gemessen von einer Grundposition des Stabs an, die dem relativen Feuchtigkeitswert entspricht, der von dem entsprechenden Indikator angezeigt wird, die Stabanzeigen in besagter Reihe oder Reihenfolge angeordnet sind, die sich in eine erste Richtung ausbreitet, wobei sich besagte Grundpositionen in einer Reihe in besagte erste Richtung erstrecken und sich die individuellen Stäbe in einer zweiten senkrechten Richtung von besagten Grundpositionen weg erstrecken, wodurch die Anzeige die Form eines Graphens der relativen Feuchtigkeit gegen die Zeit einnimmt.
3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß besagte Stabanzeigen LED-Stabanzeigen sind.

Revendications

1. Dispositif avertisseur destiné à prévenir le risque de formation de brouillard lorsque l'humidité relative de l'atmosphère s'approche d'un certain niveau auquel du brouillard est susceptible de se former, le dispositif comprenant un instrument apte à mesurer l'humidité relative ou une quantité associée et un indicateur apte à fournir une indication lorsque l'humidité relative se situe à l'intérieur d'une plage prédéterminée de 100 %, caractérisé en ce que le dispositif comprend un affichage électronique avec plusieurs indicateurs pour les valeurs d'humidité relative respectives détectées par le dispositif à des périodes de différentes longueurs par rapport à l'heure réelle, et des moyens de mémorisation pour stocker les valeurs d'humidité relative à afficher par les indicateurs, ces indicateurs étant situés physiquement dans une série ou une rangée, l'un des indicateurs à l'extrémité de la série ou de la rangée servant à afficher l'humidité relative la plus récente et chacun des indicateurs précédents dans la sé-

rie ou la rangée servant à afficher l'humidité relative mesurée à un moment prédéterminé avant le moment où a été relevée l'humidité relative affichée par l'indicateur immédiatement précédent dans la rangée ou série, le dispositif comprenant des moyens pour mettre à jour l'affichage à des intervalles prédéterminés, à chacun desquels la valeur de l'humidité relative affichée par chaque indicateur est transférée à l'indicateur précédent, pour y être affichée, et les moyens de mémoire reçoivent la valeur d'humidité relative la plus récente mise à jour pour affichage par l'indicateur sur une extrémité de la série.

2. Dispositif selon la revendication 1, dans lequel les indicateurs prennent la forme d'un affichage en bâtonnets, chacun pouvant afficher un bâtonnet d'une longueur mesurée à partir d'une position de base du bâtonnet qui correspond à la valeur d'humidité relative affichée par l'indicateur respectif, les affichages à bâtonnets étant disposés dans la rangée ou la série s'étendant dans une première direction avec les positions de base s'étendant dans une rangée dans la première direction et avec les différents bâtonnets s'étendant dans une seconde direction perpendiculaire éloignée des positions de base, de sorte que l'affichage prend la forme d'un graphique de l'humidité relative par rapport au temps.
3. Dispositif selon la revendication 2, dans lequel les affichages à bâtonnets sont des affichages à bâtonnets LED (à diodes électroluminescentes).

Fig.1a.

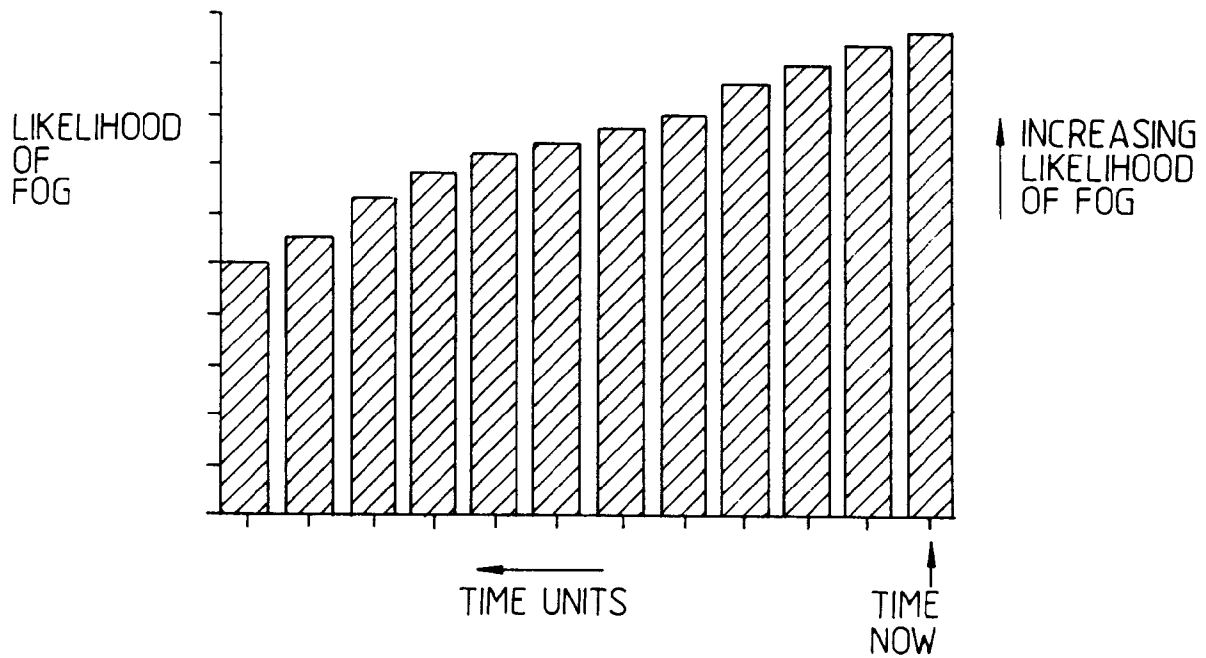


Fig.1b.

