

[54] **METHOD AND APPARATUS FOR CONTROLLING SUNLIGHT TRANSMISSION**

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[58] Field of Search 135/5, 16, 19.5, 20, 33, 135/34, 35, 2; 2/10, 177; 128/372, 394

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[57] **ABSTRACT**

A beach umbrella or parasol construction in which the top material in one embodiment is provided with a multiplicity of openings to permit a controlled portion of the sun's rays to pass through the material and reach the user. The openings also permit aerodynamic pressure equalization across the top to reduce likelihood of damaging the top during gusty wind conditions. In another embodiment of the invention, the top is fabricated from a number of radially projecting slats which may be pivoted along their longitudinal axes to vary the amount of sunlight passing through the slats. In both embodiments means may be provided to rotate the parasol about its central supporting post so that the user beneath the parasol will receive brief flashes of sunlight in rapid sequence.

8 Claims, 4 Drawing Figures

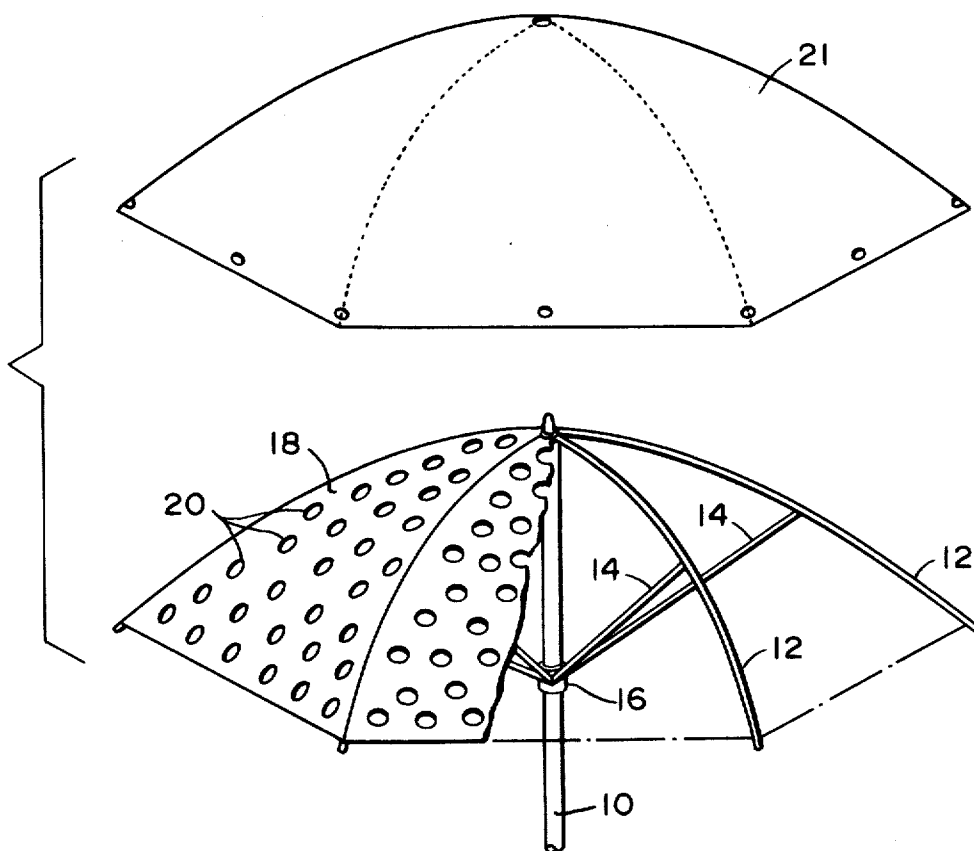


FIG. 1

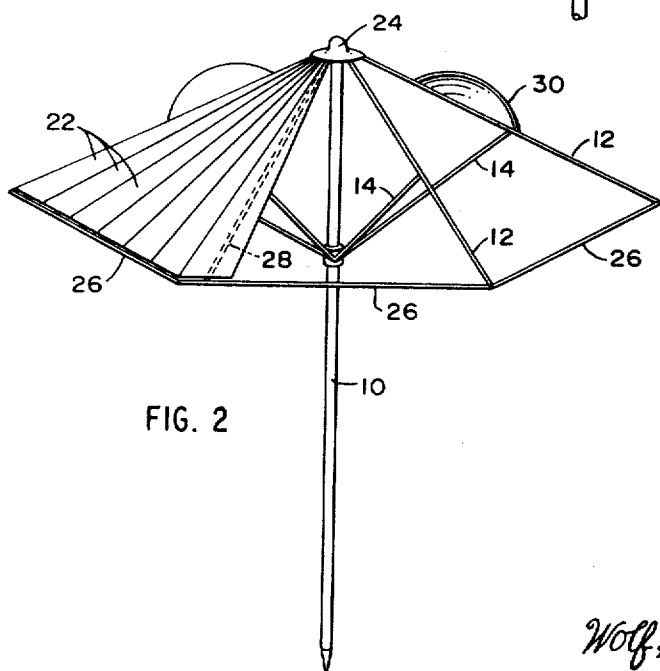
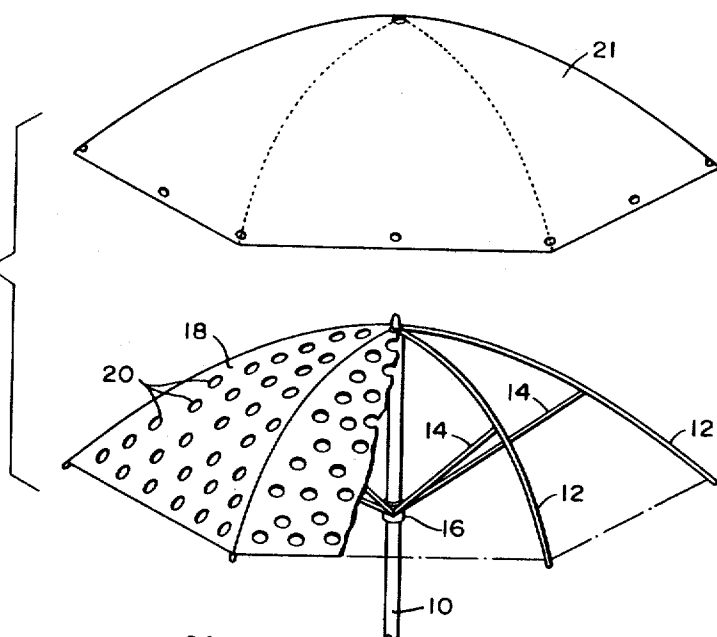


FIG. 2

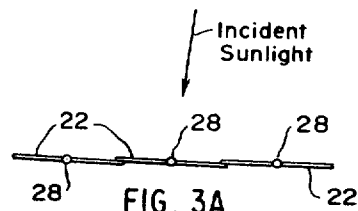


FIG. 3A

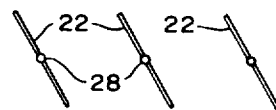


FIG. 3B

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METHOD AND APPARATUS FOR CONTROLLING SUNLIGHT TRANSMISSION

BACKGROUND OF THE INVENTION

This invention relates to an improved parasol to shade the user from the full effect of direct sunlight and to control the shade so that a portion of the sun's rays reach the user. The parasol is useful particularly in tropical environments or during the beginning of the summer in more northern latitudes when one normally must be careful to avoid becoming sun burned as a result of initial overexposure to the sun. It is useful particularly by those persons with light and sensitive skin who tend to become sunburned easily.

Although various suntan lotions, oils and other preparations are employed commonly to retard sunburn and promote gentle tanning, these preparations frequently are ineffective when used by a person who has not been exposed to the sun for some time as would be the case during the beginning of the summer or by one vacationing in the tropics. Additionally, it may not always be convenient to employ such lotions or preparations.

It is among the primary objects of my invention to provide a parasol which provides sufficient shade to preclude sunburn yet which permits sufficient sunlight to reach the user to initiate gentle tanning.

SUMMARY OF THE INVENTION

One embodiment of my invention includes an umbrella or parasol of generally conventional design having a central pole or other supporting element and a skeletal frame over which is stretched a top material of cloth, plastic or other light flexible sheet. A multiplicity of openings are formed in the top material to permit a controlled portion of the sun to reach the user beneath the umbrella top.

An additional feature of the invention resides in the elimination of any hot spots below the umbrella. Any heat which normally might tend to become trapped beneath the umbrella, particularly on balmy days, may rise upwardly through the holes to provide continuous and cool circulation.

Still another advantage of the invention resides in its resistance to damage or fracture as a result of gusting winds. The multiplicity of holes in the top material of the umbrella permits rapid pressure equalization across both surfaces of the umbrella top thus reducing materially the stresses which normally might be imposed on the umbrella top and frame as a result of high or gusty winds.

In some instances it may be desirable to preclude any sunlight from passing through the parasol and, for this purpose, the invention includes a cover which may be fitted over the top of the parasol to cover the holes formed therein.

In another embodiment of the invention, the top of the parasol is formed from a plurality of slats which extend radially and outwardly from the center of the parasol. The slats are mounted to the frame structure of the parasol so that they may be pivoted above their longitudinal axes between positions in which the sun is precluded from passing through the slats and a position in which the slats lie in a plane substantially parallel to the incident sunlight which then may pass through the top. The angular position of the slats may be adjusted to vary the degree of sunlight passing therebetween.

Both embodiments of the invention may include a further modification in which the top of the parasol is rotatably mounted to its central supporting post so that the incident sunlight is alternately interrupted and reaches the user in rapidly repeated brief flashes. The parasol top may be rotated by a motor or may include vanes or the like which rotate the parasol top in response to the wind.

It is among the objects of my invention to provide a technique for controlling the transmission of sunlight and to minimize the likelihood of sunburning, particularly in relatively intense sunlight.

A further object of the invention is to provide a method and apparatus for controlling the incident sunlight on the user which avoids the use of lotions, creams, and the like.

Another object of the invention is to provide a technique for controlling incident sunlight in which the degree of sunlight reaching the user may be controlled.

A further object of the invention is to provide a method and apparatus which enables one to remain outdoors for extended periods of time while avoiding discomfort from the effects of relatively intense sunlight.

Still another object of the invention is to provide a parasol having perforations or openings formed therein which permit only a portion of the incident sunlight to pass therethrough.

DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the invention will be understood more fully from the following detailed description thereof with reference to the accompanying drawings wherein:

FIG. 1 is an illustration of one embodiment of the invention in which the parasol top is of continuous construction except for numerous perforations formed therein;

FIG. 2 is an illustration of another embodiment of the invention in which the parasol top is formed from a plurality of radially and outwardly projecting slats which may be pivoted or twisted to various positions to control the amount of sunlight passing through the top;

FIG. 3A is a somewhat diagrammatic illustration of the slats of the embodiment shown in FIG. 2 as viewed from one end of the slats and showing the position of the slats when fully closed to block fully the sunlight; and

FIG. 3B is an illustration of the slats similar to that of FIG. 3A illustrating the position of the slats when pivoted to permit a portion of the incident sunlight to pass therethrough.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

As shown in FIG. 1, one embodiment of the invention includes a parasol or umbrella of generally conventional design having a rigid center post 10, which supports, at its upper end, a skeletal frame consisting generally of a plurality of radially extending ribs 12. In most instances the ribs 12 will be pivotally mounted to the upper end of the post 10 so that they may be folded downwardly along the post 10 for more compact storage. The ribs 12 generally are supported by struts 14 which are also pivoted, at their ends, to the center of the ribs 12, and also to a sliding ring 16 which is movable along the post 10. Any number of conventional ar-

rangements may be employed for locking the ring 16 in a position to maintain the struts 14 and ribs 12 in a radially extended position to open the parasol.

The ribs 12 are covered by a flexible umbrella top which may be formed from a sheet of cloth, plastic, metal foil, rubber or other material suitable for such use. The umbrella top 18 is formed with a multiplicity of openings 20 which may be spaced equally from each other or may be arranged randomly over the surface of the umbrella top 18. In general, equally spaced holes are preferred in that they may be more simple to manufacture in mass production techniques. The opening may be of any selected shape as round, triangular, pentagonal, hexagonal, octagonal or any other shape regular or irregular.

The multitudinous openings permit some of the sunlight to pass therebetween to the user. The dimensions and spacing of the openings can be selected to pass between 20 to 75 percent of the holes and their spacing may be varied according to the region where the parasol is to be used. In tropical latitudes where the sunlight is intense the openings may be smaller and fewer in number. In more northern latitudes where the sunlight is not as intense, the openings may be larger and more closely spaced.

Although the invention is shown, in the illustrative embodiment, as employed in a beach umbrella or a portable hand-carried parasol, it may be employed with equal efficiency in any protective covering such as with an awning, roof covering etc.

In some instances it may be desirable to convert the parasol shown in FIG. 1 to one having no holes or openings. For this purpose, the invention also includes an outer, supplemental covering which is continuous and has no holes. This outer covering 22 may be fit over and about the external surface of the foraminous top 18.

As mentioned above, the other advantages of the parasol include the tendency to maintain the region beneath the parasol at a cool temperature by permitting warm air to rise upwardly through the opening, especially on calm days. Furthermore, the openings permit the pressure on either side of the top covering 18 to be equalized thus retarding the likelihood of uprooting of the beach umbrella by gusting winds or, when the parasol is hand carried, fracturing of the supporting ribs and struts 12, 14.

In another embodiment of the invention shown in FIG. 2, the umbrella top is fabricated from a plurality of slats 22 which, when the umbrella is open, extend radially and outwardly from a central hub 24 mounted on top of the supporting post 10. This embodiment also includes the struts 14, and ribs 12 which also are fastened to the central hub 24. The widthwise dimension of each of the slats 22 diverges radially and outwardly along its length. The outer ends of the slats are supported by peripheral frame elements 26 which are of flexible design to enable the umbrella to be folded in the conventional manner. The slats 22 are pivotally mounted between the hub 24 and peripheral frame elements 26 to enable the slats to be pivoted to desired positions about their longitudinal axes 22. This arrangement may include pivot pins or deformable torsion elements, indicated generally by the reference character 28, which are connected to the central hub 24 and peripheral frames 26.

As shown in FIG. 3A, the slats are dimensioned so that they are pivoted to the position shown in FIG. 3A (hereinafter referred to as horizontal) the adjacent slats will overlap or abut each other and will preclude sunlight from passing through the the parasol. The slats may be pivoted about their longitudinal axis as shown in FIG. 3B to permit the incident sunlight to pass there-through. The quantity of sunlight transmitted is dependent on the angular position of the slats 22 in relation to the direction of the sunlight. The slats may be adjusted by the user to transmit the desired amount of sunlight.

The slats or blades may be fabricated from any number of materials such as thin metal sheeting, plastic, rubber and the like. Alternative construction may include a textile covered metal or plastic frame.

Although the embodiments of the invention described thus far do permit the amount of transmitted sunlight to be controlled, a more uniform and homogeneous transmission may be obtained by rotating the umbrella top so that the sunlight transmitted to the user beneath the parasol reaches him in brief flashes at a relatively high frequency. In this improved arrangement, the sunlight will not impinge on the user along a number of fixed beams. Instead, the plurality of light beams passing through the openings in the top will sweep continuously past the user to promote even distribution of the transmitted sunlight beneath the umbrella top.

Any number of arrangements may be employed to rotate the umbrella top. In the illustrative embodiment, the central hub 24 and ring 16 are mounted rotatably to the supporting post 10. The bearing surfaces between the hub 24 and rings 16 preferably are low friction and may be formed from roller bearings, teflon journals, or any other well-known arrangements. The umbrella top may be rotated by a battery powered motor (not shown) or by the wind. Because of the angular disposition of the slats 22 the wind will rotate the umbrella top as the wind passes through and about the slats 22. If desired, supplemental aerodynamic vanes 30 may be attached to the umbrella top to aid in rotating the umbrella top. In the event that there is no wind, the motor-driven arrangement may be employed.

Thus, I have provided a method and apparatus for controlling the rate of tanning by reducing the quantity of sunlight reaching the user in which the sunlight is transmitted to the user in a multiplicity of spaced light beams. Additionally, the tanning action may be made more uniform by causing the light beams to sweep over the user repetitively.

It should be understood that the foregoing description is intended merely to be illustrative of my invention and that other embodiments and modifications may be made thereto without departing from its spirit. For example, although the invention has been described as being embodied in a parasol having a central post and umbrella top, the invention may be practiced with any number of structures which are intended to block out selected portions of the incident sunlight and which transmit the unblocked sunlight in a plurality of spaced beams. Furthermore, the improved version of the invention in which the beams are caused to sweep repetitively over the user may be embodied in awnings or other, similar shading devices. Additionally, although the amount of light reaching the user is shown as being controlled by adjustable slats, other arrangements may be provided for controlling the dimensions

of the light transmitting spaces defined between the light blocking elements.

In the following claims the term "parasol" is intended to mean not only beach umbrella or hand carried parasols but also to include any structure such as an awning which is intended to provide shade and shield the user from the sun.

Having thus described my invention what I desire to claim and secure by Letters Patent is:

1. An umbrella comprising,
a central supporting pole,
cover supporting means extending about and supported by said supporting pole,
and cover means supported by said cover supporting means and including means defining a plurality of continuously open apertures free from material over substantially the entire surface of said cover means that transmit both sunlight and air there-through for continuously exposing the user there-beneath to a portion only of the sunrays energy incident upon the top of said cover means and transmitting the flow of air therethrough,
the remainder of said cover means consisting of portions that alternate with said apertures for preventing the transmission of sunrays and air there-through.
2. An umbrella as defined in claim 1 and further comprising,
means mounting said cover support means and cover means for rotation about said central supporting

pole axis.

3. An umbrella as defined in claim 2 and further comprising,

aerodynamic means comprising said cover means for rotating said cover support means and cover means in response to the wind.

4. An umbrella as defined in claim 2 and further comprising,

motor means operatively connected to said cover support means for effecting said rotation.

5. An umbrella as defined in claim 1 wherein said apertures are arranged to continuously pass between 20 and 75 percent of the incident sunlight energy there-through.

6. An umbrella as defined in claim 1 and further comprising,

means for varying the dimensions of said apertures to control the amount of sunlight energy continuously passing therethrough.

7. An umbrella as defined in claim 6 wherein said means for varying the dimensions of said apertures comprises,

means forming said cover means from a plurality of slats, said slats being pivotally mounted about axis which enable the edges of adjacent slats to be pivoted toward and away from each other.

8. An umbrella as defined in claim 7 wherein each of said slats extend radially from a central hub and is pivoted along radially extending axis.

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