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(54) **GARMENT WITH VENTILATION SYSTEM**

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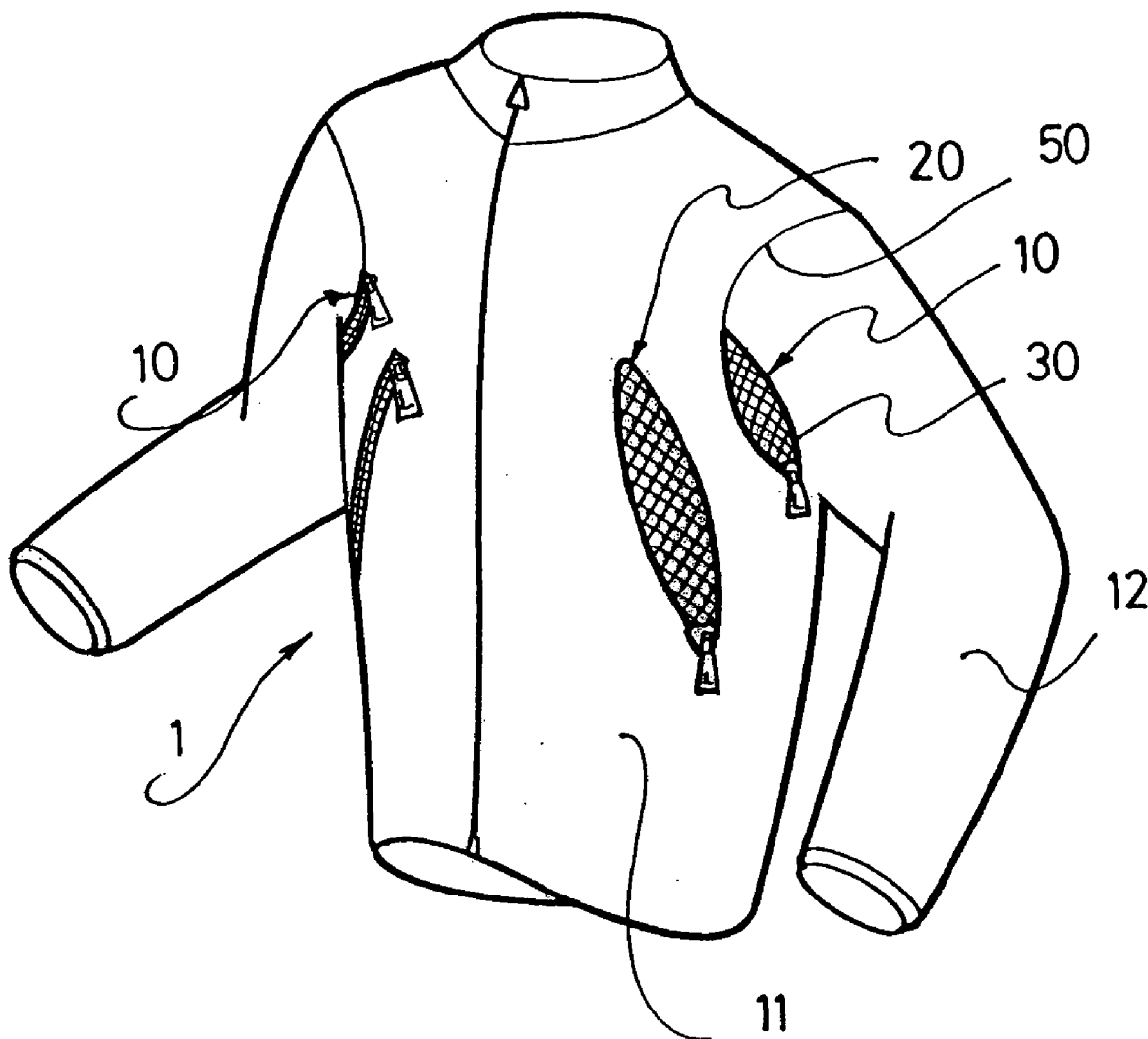
(57) **ABSTRACT**

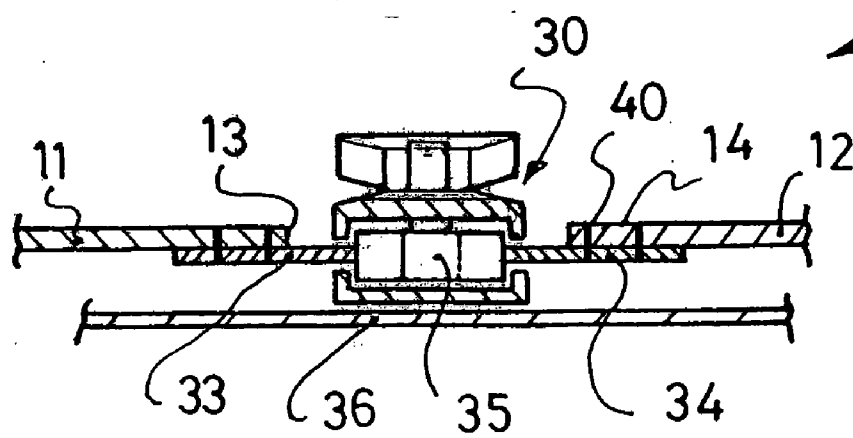
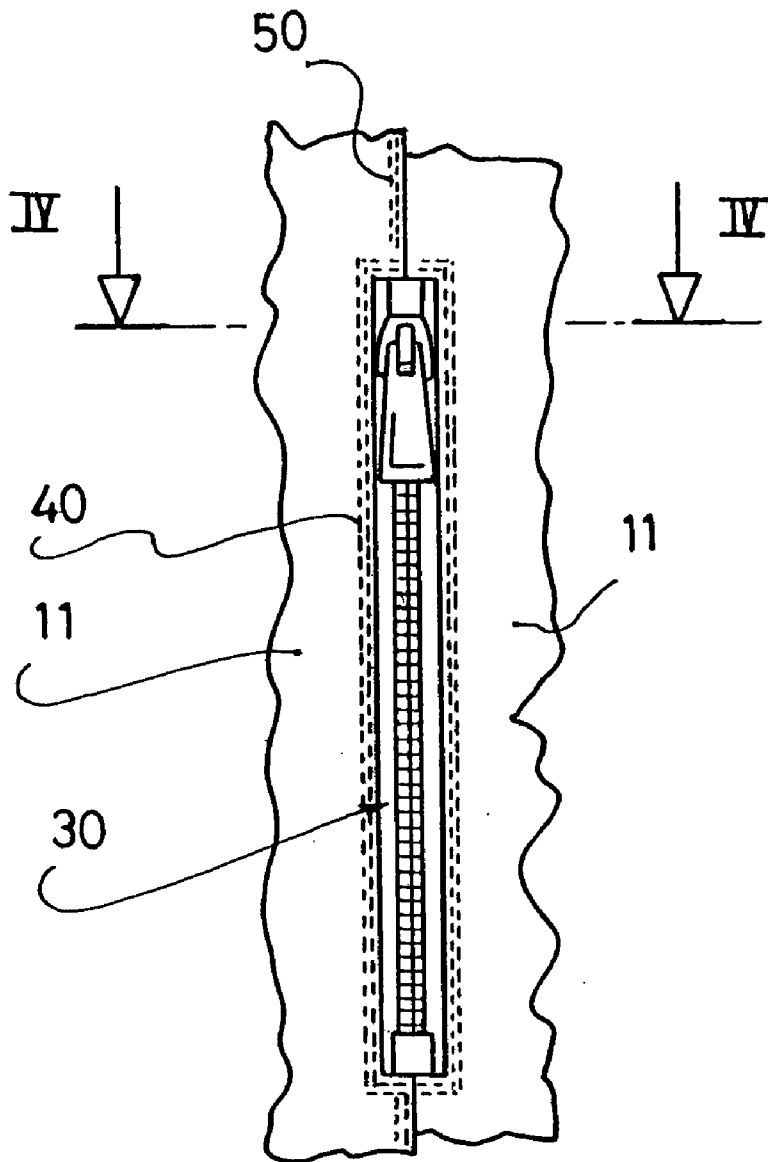
A ventilation system, particularly for garments, having a slit-type ventilation opening and a closure associated with the opening for opening/closing the opening. The invention is also related to a garment provided with one or more of such ventilation systems.

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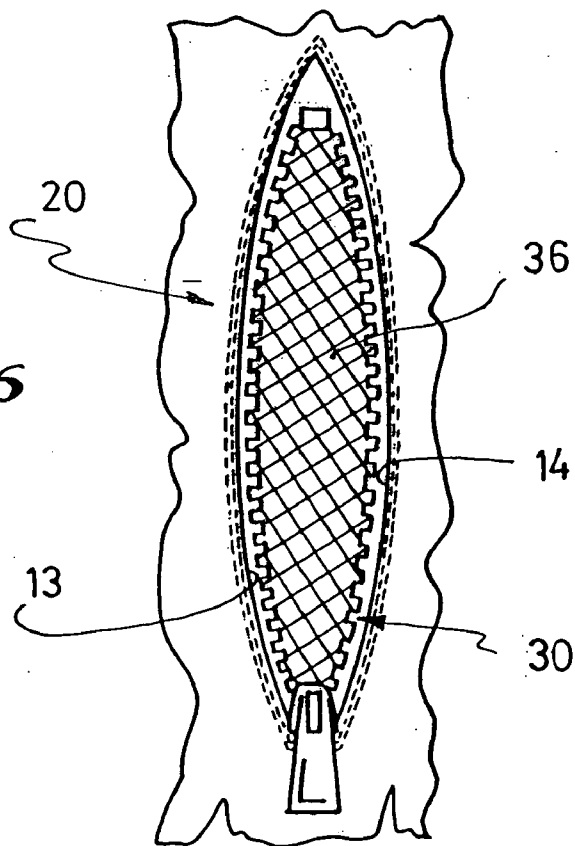
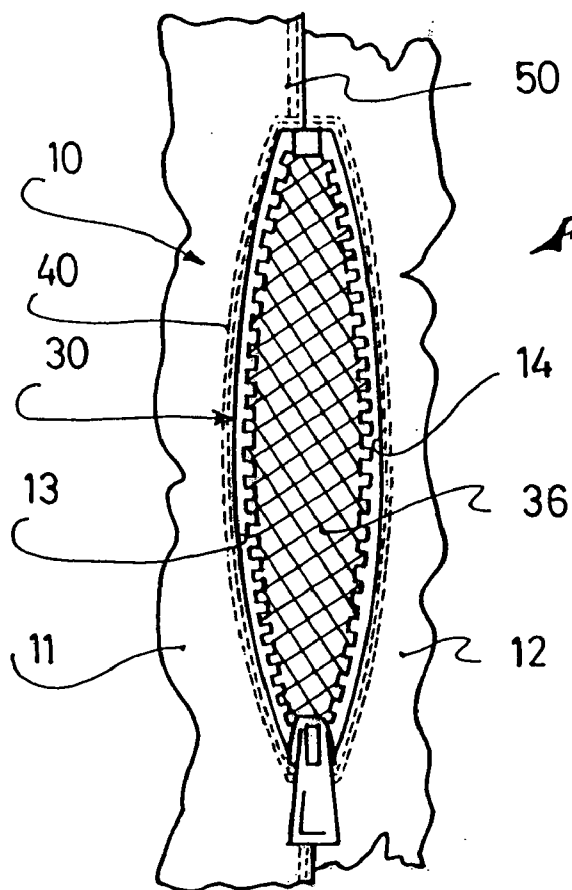


Fig. 7

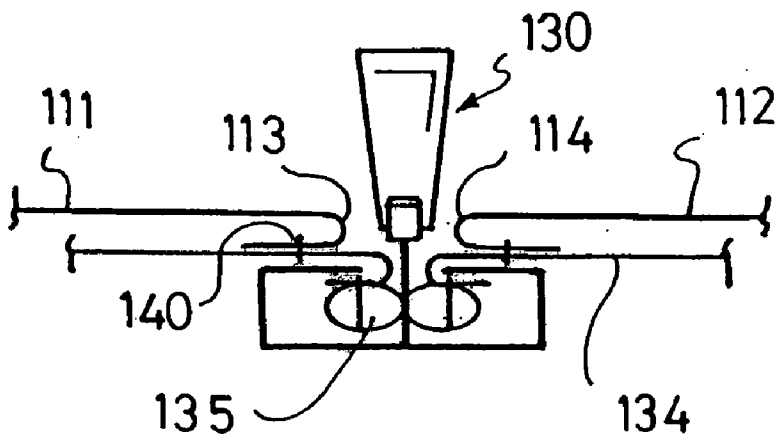
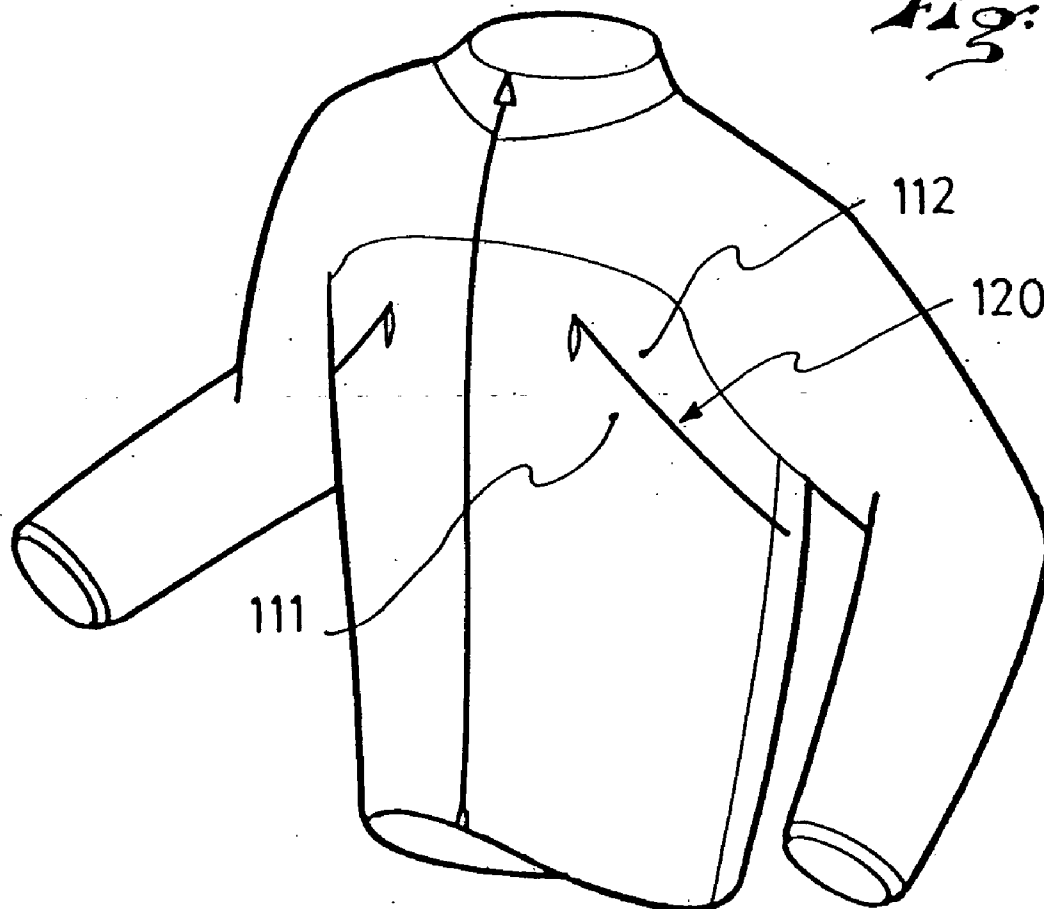


Fig. 8



GARMENT WITH VENTILATION SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based upon French Patent Application No. 02.15956, filed Dec. 12, 2002, the disclosure of which is hereby incorporated by reference thereto in its entirety and the priority of which is hereby claimed under 35 U.S.C. §119.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a ventilation system particularly for garments, such as everyday garments, sports garments, technical garments, etc., as well as to such garment which incorporates such ventilation system.

[0004] The invention is more particularly adapted to the ventilation, and a ventilated garment, in the field of sports and outdoor garments, and specifically to garments such as sports jackets, windbreakers, winter sports jackets, as well as pants, shorts, etc.

[0005] 2. Description of Background and Relevant Information

[0006] Persons who are employed in various outdoor occupations or who are involved in sports or outdoor activities often wear garments that are impermeable to water or moisture or at least which are used as windbreakers.

[0007] A substantial drawback to windbreakers or water/moisture impermeable garments is their poor ventilation.

[0008] Indeed, because the material constituting such garments is impermeable to water, or at least to wind, it usually constitutes a barrier to the evaporation of moisture released by the body during physical exercise, such that garments worn underneath can become completely saturated with moisture, perspiration in particular.

[0009] The breathability of such waterproof and/or windproof garments can be improved by using so-called breathable-impermeable materials, i.e., materials permeable to water vapor but not condensed water (rain). These garments are nonetheless very fragile and very expensive. In addition, their degree of breathability is limited to a given ratio for transmitting water vapor which is not always sufficient for the user, and moisture-related problems always occur.

[0010] Another way for improving the breathability of such garments is to provide them with ventilation means, such as openings, that can be opened or closed. The drawback to this type of ventilation is in keeping the opening truly opened so as to allow the entry of air, particularly when the user is stationary.

[0011] As a matter of fact, these openings generally are only slits, and means for expanding and for maintaining these slits wide open must be provided for obtaining a satisfactory ventilation.

[0012] Commonly owned U.S. Pat. No. 6,339,845 provides for associating a system for expanding the opening with a slit-type ventilation system.

[0013] In the examples described, the expanding system is an elastic device such as a generally V-shaped elastic pin,

each arm of which is associated with an edge of the opening and which is compressed during closure.

[0014] When the closure of the opening, such as a zipper, is opened, it is automatically widened under the effect of the elastic pin, thus providing the desired ventilation.

SUMMARY OF THE INVENTION

[0015] An object of the present invention is to provide an improved ventilation system, particularly so as to simplify and reduce manufacturing and assembly costs thereof.

[0016] This object is achieved in the ventilation system according to the invention, which includes the type having a slit-type ventilation opening and a closing arrangement associated with the opening for opening/closing the opening, particularly wherein the slit of the opening is substantially non-rectilinear.

[0017] Preferably, the slit has a substantially oval shape. At least, the slit widens along its length between its ends. Thus, in the closed position, the material of the edges of the opening is pre-stressed due to the particular cut-out of the opening, and the latter therefore widens automatically so as to reassume its initial non-rectilinear form or contour, in this case, an oval shape, upon the opening of its closing arrangement and, thereby, returning the material of the edges to a non-stressed state.

[0018] With a simple appropriate cut-out of the opening, the desired object is achieved very simply and at a minimal cost.

[0019] According to the invention, therefore, an expander, as used in the above-referenced patent, can be omitted.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The invention will be better understood and other characteristics thereof will become apparent by means of the following description, with reference to the attached schematic drawing showing, by way of non-limiting examples, certain preferred embodiments, and in which:

[0021] **FIG. 1** is a perspective view of a garment integrating a ventilation device according to the invention;

[0022] **FIG. 2** is a detailed and somewhat exploded view of an enlargement of a ventilation device before assembly;

[0023] **FIG. 3** is a view, similar in size to **FIG. 2**, after assembly;

[0024] **FIG. 4** is a cross-sectional view along the line IV-IV of **FIG. 3**;

[0025] **FIG. 5** is a view, similar to **FIG. 3**, in the open position;

[0026] **FIG. 6** is a view, similar to **FIG. 5**, of another embodiment;

[0027] **FIG. 7** is a cross-sectional view of an assembly according to an embodiment shown in **FIG. 8**, which embodies a so-called invisible zipper;

[0028] **FIG. 8** is a view similar to **FIG. 1**, but showing a garment employing a ventilation device according to the invention, using the invisible zipper of **FIG. 7**.

DETAILED DESCRIPTION OF THE
INVENTION

[0029] FIG. 1 shows a garment, such as a sports jacket or a windbreaker 1, having ventilation devices 10, 20 in the areas of the armholes and the chest, respectively.

[0030] FIGS. 2-5 show more specifically the construction of the ventilation device 10 located in the area of the armholes.

[0031] As shown in FIG. 2, the ventilation device 10 according to the invention is positioned between two yokes 11 and 12 of the garment, i.e., two constituent portions of the garment adapted to cover respective parts of the wearer's body, in this case, namely a front panel 11 and a sleeve 12 of the garment, and it is adapted to be closed by a slide fastener 30, which is shown in the illustrated embodiment as a zipper.

[0032] The yokes 11, 12 can also be provided in different areas of the garment and can be constituted, for example, by front or rear half panels of the garment.

[0033] In the area of the zone for assembling the zipper 30, the edge of each yoke 11, 12 is cut out in a half circle, an arc of a circle, or an arc 13, 14, respectively. The slit defined by these edges 13, 14, therefore, is not straight or rectilinear, but has a curved contour and, in this case, is substantially oval when the zipper is assembled to the yokes. These edges 13, 14 are arranged opposite each other, and the zipper 30, closed or open, is assembled, for example, by seams 40, such as stitched seams, by each of the strips 33, 34 of the zipper, respectively, to each of the edges 13, 14. Alternatively, other modes of assembly other than stitching (for example, adhesive, welding) can be provided between the zipper strips 33, 34 and the edges 13, 14 of the opening.

[0034] The yokes 11, 12 are also assembled together by a seam, such as a stitched seam 50, or the like, on both ends of the zipper 30. This seam 50 can furthermore be at least partially the same as the seam 40.

[0035] Once the zipper 30 is assembled, it exerts a traction force on each of the edges 13, 14, because, due to the form of the edges in an arc, there is indeed a "shortage" of fabric.

[0036] A pre-stress is therefore exerted on each of the yokes 11, 12 so that, as soon as the zipper 30 is opened, the edges 13, 14 will be automatically spaced apart, as the material of the yokes returns to a non-stressed condition, and the ventilation device 10 will thereby offer a wide opening that is sufficient for good ventilation.

[0037] By means of cutting and stitching operations, one thus can manufacture, at a minimal cost, a ventilation device whose opening widens, i.e., whose edges are separated one from the other, automatically upon opening of the closing system, i.e., the opening of the zipper or slide fastener.

[0038] As shown in FIGS. 1 and 4, a netting or mesh fabric 36, or the like, i.e., an aerated material, connects the edges 13, 14 of the opening, so that air can enter through the aerated material once the zipper is opened. In the drawing figures, the teeth of the zipper, or the slide of the slide fastener if the latter were to be employed, are indicated by the reference numeral 35.

[0039] FIG. 6 shows an alternative embodiment in which the opening 20 is made within the fabric itself without any yoke.

[0040] In this case, the edges 13, 14 of the arc-shaped opening are cut out, for example, by hand or with a punch, in the piece of fabric itself, and the zipper is assembled as previously described.

[0041] The functioning after assembly is the same as indicated previously.

[0042] FIGS. 7 and 8 show a particularly discreet embodiment in which the zipper 130 is of the so-called invisible zipper-type.

[0043] In such a zipper, or other slide fastener, the strips 134 supporting the teeth 135 are turned inwardly along the length of the zipper, such that the teeth 135 are completely hidden when the zipper 130 is closed.

[0044] In order to further perfect the invisibility of such a zipper, the yokes 111, 112 are assembled by a folded edge and a hidden seam 140, such as stitching, to each of the strips 134 of the zipper.

[0045] As a result, practically only the edges 113, 114 of the yokes 111, 112 remain apparent when the zipper 130 is closed, and only a "line", shown in FIG. 8, indicates the presence of the ventilation device 120.

[0046] In addition, in the example shown in FIG. 8, the ventilation device 120 is arranged in the area of a comfort pin, i.e., transversely to the garment, and therefore remains among the most discreet.

[0047] The present invention is not limited to the particular embodiments which have been described hereinabove by way of non-limiting examples.

[0048] Thus, for example, the slit could have a form other than oval, or a closing device other than a zipper could be provided without leaving the scope of the present invention.

What is claimed is:

1. A ventilation system, adapted to be used in a garment, said ventilation system comprising:

a pair of opposite edges defining a ventilation opening, the ventilation opening comprising a slit type;

a closing device associated with the opening for moving the opening to and from open and closed positions, the opening having a substantially non-rectilinear contour in the open position.

2. A ventilation system, according to claim 1, wherein: the slit has a substantially oval shape.

3. A ventilation system, according to claim 1, wherein: the closing device is a zipper.

4. A ventilation system, according to claim 2, wherein: the closing device is a zipper.

5. A ventilation system according to claim 3, wherein: the zipper is constituted of two strips provided with teeth; each of the strips is sewn along a respective curved edge of the slit.

6. A ventilation system according to claim 4, wherein: the zipper is constituted of two strips provided with teeth; each of the strips is sewn along a respective curved edge of the slit.

7. A ventilation system according to claim 1, wherein:
the closing device does not include an elastic expander to move the opening to an open position.

8. A garment comprising:

at least one portion adapted to cover a part of a wearer's body;

at least one ventilation system, adapted to at least partially ventilate the garment, said ventilation system comprising:

a ventilation opening comprising a slit type;

a closing device associated with the opening for moving the opening to and from open and closed positions, the opening having a substantially non-rectilinear contour in the open position.

9. A garment according to claim 8, wherein:

said ventilation opening is positioned either within said portion of the garment or said ventilation opening is positioned between an edge of said portion of the garment and an opposed edge of a second portion of the garment;

in said open position of said closing device, at least said portion of the garment is non-stressed.

10. A garment according to claim 8, wherein:

said ventilation opening is positioned either within said portion of the garment or said ventilation opening is positioned between an edge of said portion of the garment and an opposed edge of a second portion of the garment;

in said closed position of said closing device, at least said portion of the garment is pre-stressed.

11. A garment according to claim 9, wherein:

said ventilation opening has a pair of opposite ends;
in said open position of said closing device, said ventilation opening increases in width between said pair of opposite ends.

12. A garment according to claim 9, wherein:

said ventilation opening is defined by a pair of opposite edges, each of said edges having an arcuate shape.

13. A garment comprising:

at least one portion adapted to cover a part of a wearer's body;

at least one ventilation system, adapted to at least partially ventilate the garment, said ventilation system comprising:

a ventilation opening positioned either within said portion of the garment or positioned between said portion of the garment and another portion of the garment;

said ventilation opening having a closed position and an open ventilating position;

in said open ventilating position of said ventilation opening, at least said one portion of the garment is non-stressed;

a slide fastener for moving said ventilation opening between said open and closed positions.

14. A ventilation system, according to claim 13, wherein:
said ventilation opening has a substantially oval shape.

15. A ventilation system, according to claim 13, wherein:
said closing device is a zipper.

16. A ventilation system according to claim 15, wherein:
said zipper is constituted of two strips provided with teeth;

each of said strips is sewn along a respective curved edge of said ventilation opening.

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