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(71) Applicant (for all designated States except US): **ITI INDUSTIALE S.R.L.** [IT/IT]; Via F. Ili Bandiera 13, I-20016 Pedro MI (IT).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **SCHIRALDI, Gaetano** [IT/IT]; Via F. Ili Bandiera, 13, I-20016 Pero MI (IT).

(74) Agents: **CICERI, Fabio** et al.; c/o Perani & Partners, Piazza San Babila, 5, I-20122 Milan (IT).

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(54) Title: PROTECTIVE DEVICE FROM LUMINOUS RAYS AND/OR FROM THE EYESIGHT -AND PRODUCTION METHOD OF SAID DEVICE

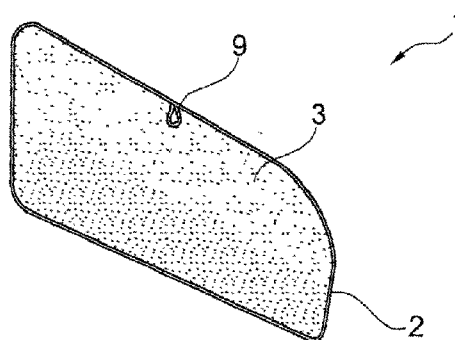


Fig. 1A

(57) Abstract: The present invention concerns a device for protection from light radiation and/or from the view, comprising a frame (2) and a protection element (3) that acts as a surface for protection from light radiation and from the view. The device (1) is characterized in that the frame (2) is at least partially covered by a layer of thermoplastic material (4), said protection element (3) being joined thereto such that, at said thermoplastic material (4), the protection element (3) penetrates said thermoplastic material (4).



DESCRIPTION

"Protective device from luminous rays and/or from the eyesight and production method of said device."

Technical Field

The present invention relates to a device for protection from light radiation and/or from the view and a method of manufacturing such device, preferably but without limitation to a device that is adapted to be affixed to one side of a glass of a vehicle, such as a car, a van, a trailer but also windows of houses, boats, ships and the like, as defined in the preamble of claims 1 and 13 respectively.

Background art

Devices for protection from light radiation and/or from the view are known in the art, and have a protection element that may be clear or obscure or have apertures, and may be colored, or have images or text thereon. These protection devices may be joined, for instance, to the interior of door glasses and/or the rear window to provide protection from sun rays and/or to hide passengers and/or the things contained in the car from the view.

Such devices comprise a frame upon which the element for protection from light radiation is laid.

Particularly, the frame is, for instance, snap-locked into a groove or a gap between the glass and its seal or the frame has special coupling means for coupling the frame to the glass, the seals, the metal sheet or the plastic panels;

finally, the frame is shaped to conform to the contour of the glass, to be joined without the help of any coupling means.

The protection element usually consists of a partially obscuring fabric which is joined with the frame using an adhesive layer or an interlock arrangement or by sewing.

Such devices are disclosed, for instance, in document DE19727510.

While these devices provide undoubted advantages, they are still affected by certain drawbacks, such as the loss of adhesion of the adhesive layer upon prolonged exposure of the device to sun rays.

This problem is obviated by having the protection element retained against the frame by suitable sewing. Nevertheless, this requires manufacturing times and processes that increase the final cost of the product.

Technical problem

Therefore, a need is apparently felt, in the field of devices for protection from light radiation and/or for hiding people or things in the vehicle from the view, for a device whose protection element does not fall off the frame and is free of any gathers or pleats.

The present invention is based on the problem of providing a device whose protection element is securely connected to the frame with a stable and precise tension.

Technical solution

This problem is solved by a device for protection from

light radiation and/or from the view as defined in claim 1.

This problem is also solved by a method of manufacturing a device for protection from light radiation and/or from the view as defined in claim 13.

Advantageous effects

The present invention provides a device for protection from light radiation and/or from the view and a method of manufacturing it, that can ensure a more reliable and constant tension between the protection element and the frame than in prior art devices.

Brief description of the drawings

Further features and advantages of the device and method of manufacture according to the present invention will be apparent from the following description of preferred embodiments thereof, which are given by way of illustration and without limitation with reference to the accompanying figures, in which:

- Figure 1A shows a perspective view of a first embodiment of the device for protection from light radiation and/or from the view, that can be manufactured without a finishing hem, according to the present invention;

- Figure 1B shows a front view of the frame of the device as shown in Figure 1A when it has no protection element thereon;

- Figure 1C is a sectional view of the frame of Figure 1B as taken across line A-A;

- Figure 1D is another sectional view of the frame of Figure 1B as taken across line B-B;

- Figure 2A shows a perspective view of a second embodiment of the device for protection from light radiation and/or from the view, when it has a finishing hem, according to the present invention;

- Figure 2B is a front view of the device of Figure 2A;

- Figure 2C is a sectional view of the device of Figure 2B across line D-D, which highlights the plastic cover for aesthetically concealing the overlap area of the sewn hem, which cover is appropriately shaped and positioned to be used for disengaging the device from the retention details;

- Figure 2D is another sectional view of the device of Figure 2B as taken across line C-C, showing the hem aesthetically added to the frame;

- Figure 3 is a view of a detail of the first or second embodiment of the present invention, showing a possible disengagement system;

- Figure 4 is a cross-section of the device of Figure 1, in which the protection element and the layer of thermoplastic element are shown in interpenetrating relation.

Detailed description

Referring to the accompanying figures, numeral 1 designates a device for protection from light radiation and/or from the view, which is designed to be installed on any type of window.

For example, the device 1 may be mounted to the interior of door glasses and/or the rear window of cars, vans, trucks, trailers and the like, but also of aircrafts or windows of houses, boats, ships, etc.

Reference will be made hereinafter, by way of example, to the situation in which the device 1 is joined to the interior, i.e. the non-exposed side of a car window.

The device 1 comprises a frame 2 and a protection element 3 which acts as a surface for protection from light radiation and/or from the view for people and/or things that are located, for instance, in the vehicle equipped with the protection device 1.

As used herein, the term light radiation shall be intended to designate, for instance, sun rays or rays from high beam headlights of a car, i.e. radiation having a wavelength falling in the visible spectrum and/or the ultraviolet spectrum.

For this purpose, the protection element 3 may be formed from:

- a material that may be partially or wholly transparent to light radiation and/or to the view or
- a material that may be totally blind to light radiation and/or to the view.

Such materials may be also tinted or bear images and/or text.

Particularly, the material for making the protection

element 3 consists of a polyester fabric or a plastic or vinyl laminate, comprising a single layer or multiple layers joined together.

In a preferred embodiment, the protection element 3 is a PVC fabric that may also dyed in two colors and/or have apertures of variable sizes on its surface (i.e. be perforated). Such fabric is known to the skilled person under the trademark Filtravedo^R and will not be described in greater detail hereinafter.

Advantageously, the frame 2 is partially covered by a layer of thermoplastic layer 4.

Particularly, the protection element 3 is joined thereto at the thermoplastic material 4 to form one piece with the thermoplastic material.

In other words, also referring to Figure 4, the protection element 3 penetrates the thermoplastic material 4 to form one piece therewith, thereby ensuring that the protection element 3 and the thermoplastic material 4 are firmly and securely joined together.

Particularly, the obscuring fabric 3 is unremovably joined to the thermoplastic layer 4, which means that it cannot be removed therefrom.

Preferably, the protection element 3 is joined to the thermoplastic material 4 in pleatless, gatherless stretched arrangement.

It shall be noted that, by joining the protection element

3 to the thermoplastic material 4, long-time reliability is ensured, even upon prolonged exposure to solar radiation, and tension of the protection element 3 is improved as compared with prior art devices, for greater reliability with time.

It should be further noted that the term partially covered is intended to designate the case in which the frame 2 has one or more portions of its outer surface covered with the thermoplastic material 4.

Preferably, the outer surface of the frame 2 is entirely covered with the thermoplastic material 4.

According to a peculiar aspect of the present invention, the protection element 3 and the thermoplastic material 4 are joined together by heat sealing, high-frequency welding and/or ultrasonic welding.

This provides improved features in terms of reliability, corrosion prevention and maintenance of the proper tension value of the protection element 3 with time, as compared with prior art devices.

For the frame 2 to be partially or entirely covered with the layer of thermoplastic material, the frame 2 is immersed in a tank containing the thermoplastic material 4.

Immersion of the frame 2 in the tank causes the frame 2 to be partially or entirely covered with the thermoplastic material 4.

It should be noted that the frame 2 shall be covered with the thermoplastic material 4 before joining the protection

element 3 thereto.

Alternatively, the thermoplastic material 4 may be sprayed on the frame 2 in liquid or powder form, using suitable tools.

In one aspect of the present invention, the layer of thermoplastic material 4 has a thickness S ranging from 0.1 mm to 5 mm.

Preferably, the thickness S of the layer of thermoplastic material 4 ranges from 0.1 mm to 0.6 mm and more preferably the thickness S is 0.5 mm.

It shall be noted that the material from which the thermoplastic material 4 is formed is selected from the group comprising polypropylene, polystyrene, polyethylene terephthalate, polyethylene, polyamide, PVC and/or nylon.

According to another embodiment, the step of covering the frame 2 with the layer of thermoplastic material 4 may consist in placing a heat-shrinkable sheath (not shown) on the frame 2.

Particularly the heat shrinkable sheath is fixed to the frame 2 by applying heat or interposing a layer of adhesive material therebetween.

Referring now to Figures 1A-1B and 2A-2B, the frame 2 is shown as a specially shaped frame, having a predetermined shape.

For instance, according to the particular embodiment as shown in Figures 1B and 2B, the frame 2 may be shaped to

conform to the glass with which it is designed to be joined, e.g. the glass of a rear window of a motor vehicle.

Other shapes may be envisaged for the frame 2 according to particular needs.

In other words, in order to form the required bends in the frame and maintain a proper tension of the protection element 3, while preventing any permanent deformation of the frame during normal use, preferred materials should exhibit a good compromise between tensile modulus E (or Young's modulus, with values approximately ranging from 70,000 N/mm² to 220,000 N/mm²) and the possibility of forming the required shape, as well as a proper width of the elastic portion in the stress-strain curve of metals.

For this purpose, the frame 2 comprises a metal material selected from iron, steel, aluminum or metal alloys or comprises a plastic material.

In order to obtain the desired shape of the frame 2, if the latter is made from one of the above mentioned metal materials, the metal profile shall be bent into a shape (which will change through products according to the area to be covered); this step is preferably carried out using CNC machines which will make the bends and curves required to obtain the desired shape, from a two-dimensional frame design.

In order to obtain the desired shape of the frame 2, if the latter is made from the above mentioned plastic material,

an injection molding step is provided. To ensure elasticity in a frame 2 made from plastic, a metal core shall be maintained therein, whereby the injection molding process will be carried out by comolding of a metal frame.

This will provide an aesthetically valuable finish of the frame, while allowing a special seat to be formed along its perimeter for welding (preferably ultrasonic welding) of the fabric.

Preferably, the frame 2 has a rod or tubular shape, having a circular plan shape with a diameter S' ranging from 2 mm to 6 mm.

Preferably, the diameter S' is 4 mm.

Other cross-sectional shapes of the frame 2 may be envisaged. e.g. quadrangular shapes.

Referring to Figure 1D, although the same applies to the embodiment as shown in Figures 2A to 2D, the frame 2 is formed preferably but without limitation into a (possibly irregular) closed loop, and it can be closed by welding or clinching (i.e. using metal fasteners) 5.

Thus, once the frame 2 has been bent as desired, the two ends thereof are joined together by welding or clinching into a closed loop shape.

According to a preferred embodiment, the protection element 3 is joined at the thermoplastic material 4 in the proximity of a free edge of the protection element.

No pleat and/or bulge should result from this coupling

arrangement.

Particularly, the free edge portion of the protection element 3 exceeding the perimeter defined by the frame 2 is trimmed.

Such trimming action is performed as the protection element 3 is joined to the thermoplastic element 4 on the outer surface of the frame 2 by heat sealing, ultrasonic welding and/or high-frequency welding.

Alternatively, trimming may be performed by blanking and/or punching when the protection element 3 has already been joined to the thermoplastic material 4 that covers the frame 2 by heat sealing, ultrasonic welding and/or high-frequency welding.

Trimming may be also performed along the welding bead when the protection element 3 has already been joined to the thermoplastic material 4 that covers the frame 2 by heat sealing, ultrasonic welding and/or high-frequency welding.

In one aspect of the present invention, the device 1 may be free of (see embodiment of Figures 1A and 1B) or be equipped with (see embodiment of Figures 2A and 2B) a finish 6 adapted to conceal the frame 2.

Particularly, the finish 6 consists of a sheath that wraps around the frame 2 and the portion of the protection element 3 close to its free peripheral edge.

This sheath consists, for instance, of a textile material, whose free ends are pressed together by sewing 7

and/or ultrasonic welding, to enclose the frame 2 and the obscuring fabric.

Referring to Figure 2D, the device 1 is shown to comprise a hook 8, e.g. made of plastic or textile material, which acts as a cover for aesthetically concealing the overlap area of the sewn/welded hem.

Referring to Figure 3, the device 1 is shown to comprise a loop 9 for easy removal of the device from the glass against which it is installed.

The device 1 may be joined to the interior of vehicle windows, with or without the interposition of hook means (not shown), so that the device is placed at a predetermined distance from the glass surface to form a kind of gap.

It shall be noted that the hook means, if any are those that are commonly used in the field and will not be described herein.

Those skilled in the art will obviously appreciate that a number of variants may be envisaged to the above, still within the scope of the invention, as defined in the following claims.

CLAIMS

1. A device for protection from light radiation and/or from the view, comprising a frame (2) and a protection element (3) that acts as a surface for protection from light radiation and from the view,

characterized in that said frame (2) is at least partially covered by a layer of thermoplastic material (4), said protection element (3) being joined thereto such that, at said thermoplastic material (4), the protection element (3) penetrates said thermoplastic material.

2. A device for protection from light radiation as claimed in claim 1, wherein said protection element (3) comprises a material that obscures light radiation and/or the view, or comprises a material that is partially or completely transparent to light radiation and/or the view.

3. A device for protection from light radiation as claimed in claim 1 or 2, wherein said protection element (3) is made of polyester fabric or plastic or vinyl laminates, comprising a single layer or multiple layers joined together.

4. A device for protection from light radiation as claimed in any preceding claim, wherein said layer of thermoplastic material (4) has a thickness (S) ranging from 0.1 mm to 5 mm.

5. A device for protection from light radiation as claimed in any preceding claim, wherein said layer of thermoplastic material (4) is selected from the group comprising polypropylene, polystyrene, polyethylene terephthalate and/or

nylon.

6. A device for protection from light radiation as claimed in any preceding claim, wherein said layer of thermoplastic material (4) is a heat shrinkable sheath.

7. A device for protection from light radiation as claimed in any preceding claim, wherein said frame (2) is a frame that has a predetermined flexibility value with a Young's modulus ranging from 70,000 N/mm² to 220,000 N/mm² and shaped into a given shape.

8. A device for protection from light radiation as claimed in any preceding claim, wherein said frame (2) comprises a metal material or a plastic material.

9. A device for protection from light radiation as claimed in any preceding claim, wherein said frame (2) is closed into a loop by welding or clinching.

10. A device for protection from light radiation as claimed in any preceding claim, wherein said frame (2) is a rod or tubular member and has a circular plan shape, whose diameter (S') ranges from 2 mm to 6 mm.

11. A device for protection from light radiation as claimed in any preceding claim, wherein said protection element (3) is joined to said thermoplastic material (4) in the proximity of a free peripheral edge of said protection element (3).

12. A device for protection from light radiation as claimed in any preceding claim, comprising a finish (6) for enclosing said frame (2) and said free edge of said protection element

(3).

13. A method of manufacturing a device for protection from light radiation and/or from the view, comprising the steps of:

- providing a frame (2);

- providing a protection element (3) that acts as a surface for protection from light radiation,

said method being **characterized in that it comprises** the steps of:

- at least partially covering said frame (2) with a thermoplastic material (4);

- ~~joining said protection element (3) to said thermoplastic material (4)~~ that at least partially covers said frame (2) by heat sealing, ultrasonic welding or high-frequency welding.

14. A method as claimed in claim 13, wherein said covering step comprises the step of immersing said frame (2) in a tank containing said thermoplastic material (4) to at least partially cover said frame (2).

15. A method as claimed in claim 13, wherein said covering step comprises the step of spraying said thermoplastic material (4) on said frame (2) to at least partially cover said frame (2).

16. A method as claimed in claim 13, wherein said covering step comprises the step of placing a heat shrinkable sheath on said frame (2).

17. A method as claimed in claim 16, wherein said heat

shrinkable sheath is fixed to said frame (2) by heating or by a layer of adhesive material.

18. A method as claimed in any claim from 13 to 17, comprising the step of trimming the portion of said protection element (3) exceeding said frame (2).

19. A method as claimed in claim 18, wherein said trimming step is carried out during the step of joining said protection element (3) to said frame by heat sealing, ultrasonic welding or high-frequency welding.

20. A method as claimed in claim 18, wherein said trimming step is carried out by punching after the step of joining said protection element to said frame by heat sealing, ultrasonic welding or high-frequency welding.

21. A method as claimed in claim 18, wherein said trimming step is carried out by trimming along the welding bead after the step of joining said protection element (3) to said frame by heat sealing, ultrasonic welding or high-frequency welding.

22. A method of manufacturing a frame (2) designed for a device for protection from light radiation and/or from the view as claimed in any preceding claims from 1 to 11, comprising the step of providing a frame (2), said method being **characterized in that it** comprises the step of at least partially covering said frame with a thermoplastic material (4).

23. A method as claimed in claim 22, wherein said covering

step comprises the step of immersing said frame (2) in a tank containing said thermoplastic material to entirely cover said frame.

24. A method as claimed in claim 22, wherein said covering step comprises the step of spraying said thermoplastic material on said frame to at least partially cover said frame (2).

25. A method as claimed in claim 22, wherein said covering step comprises the step of placing a heat shrinkable sheath on said frame.

26. A method as claimed in claim 25, wherein said heat shrinkable sheath is fixed to said frame by heating or by a layer of adhesive material.

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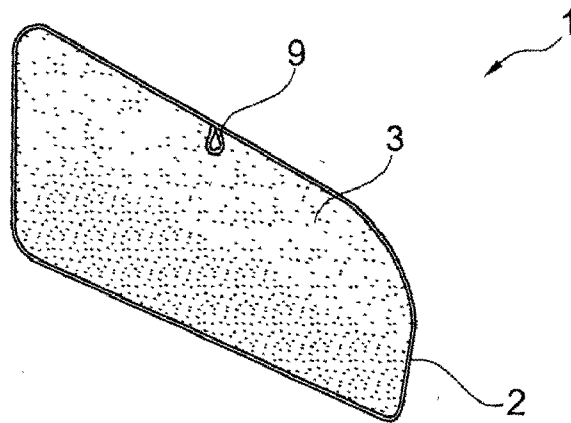


Fig. 1A

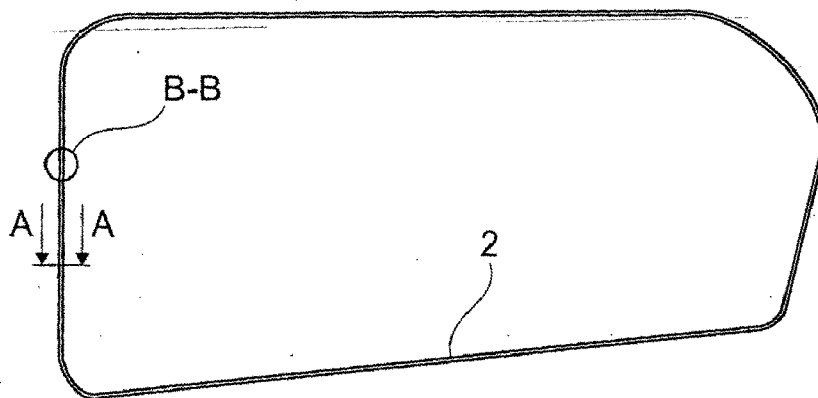


Fig. 1B

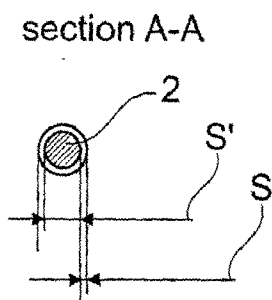


Fig. 1C

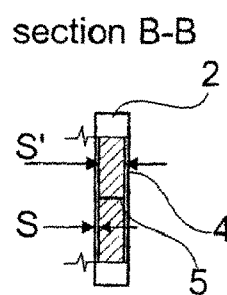


Fig. 1D

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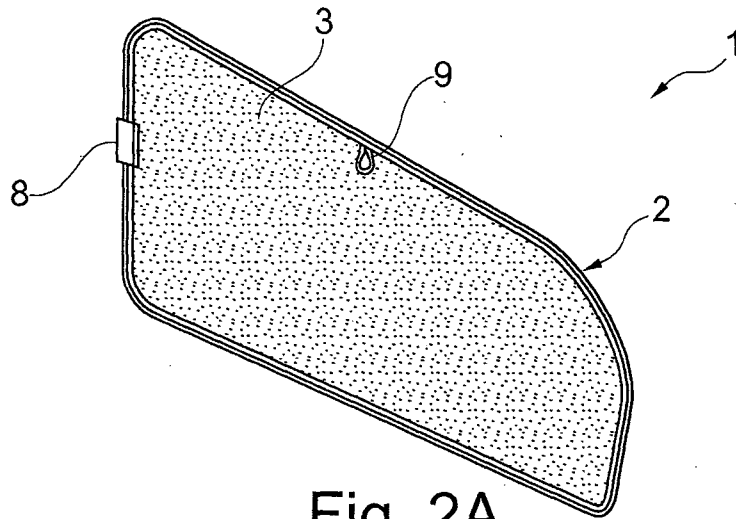


Fig. 2A

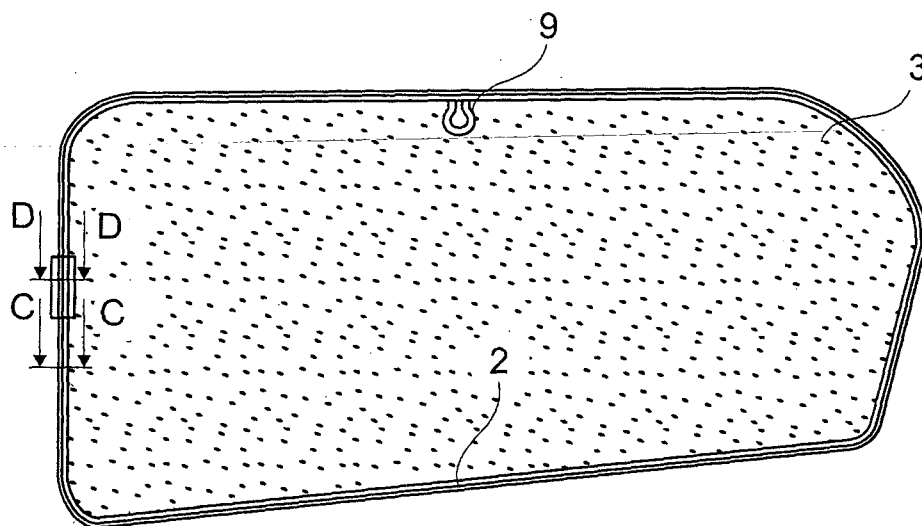


Fig. 2B

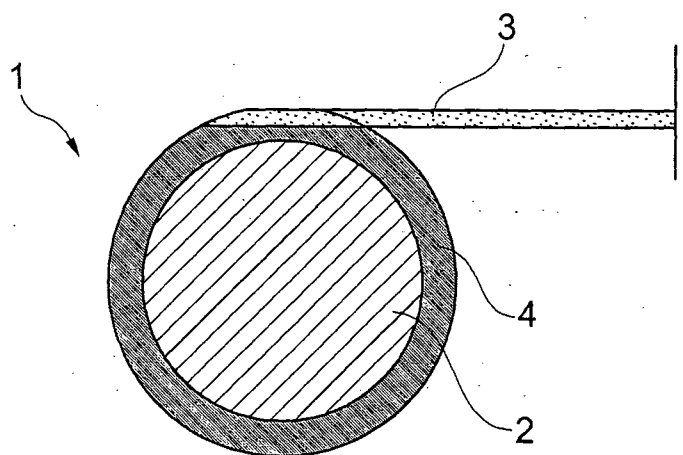
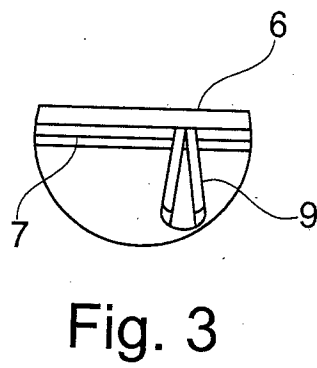
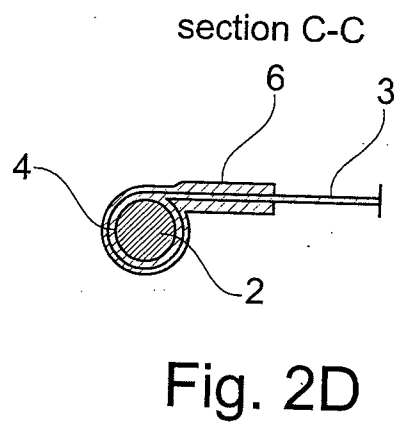
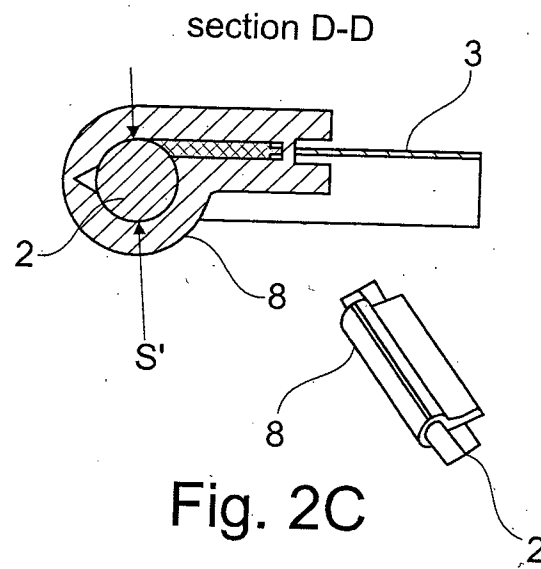


Fig. 4

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

INV. B60J1/20

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B60J B60R E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/085006 A1 (NEUMANN PETER [DE] ET AL) 8 May 2003 (2003-05-08)	1,2,4,5, 7,11-21, 23-26
Y	paragraph [0134]; figure 14 -----	9,10
X	EP 1 605 132 A2 (BOS GMBH [DE]) 14 December 2005 (2005-12-14)	1-8, 12-17, 22-26
	paragraph [0013]; figure 2 -----	
Y	WO 2005/012016 A1 (O E EUROP PLC [GB]; TAQVI JONATHAN [GB]; LEADBEATER ROBERT [GB]) 10 February 2005 (2005-02-10) page 8, line 28 - page 9, line 2; figure 2 -----	9,10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

17 October 2012

Date of mailing of the international search report

26/10/2012

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European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IT2012/000024

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