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(71) Applicant: **Soliani EMC S.r.l.**
22100 Como (IT)

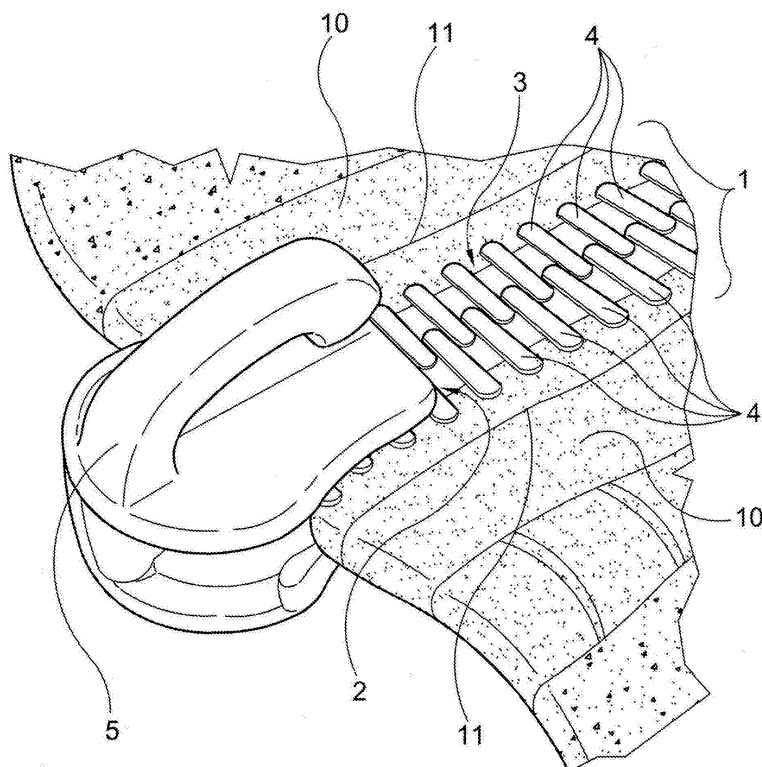
(72) Inventor: **Soliani, Ivano**
22100, Como (IT)

(74) Representative: **Ripamonti, Enrico**
Giambrocono & C. s.p.a.,
19/B, Via Rosolino Pilo
20129 Milano (IT)

(54) **Method for producing an electrically conductive zip fastener, and a zip fastener produced thereby**

(57) A method for producing an electrically conductive zip fastener (1), the zip fastener (1) comprising a first toothed element (2) to cooperate with a second toothed element (3), a slider (5) movable between said elements (2, 3), said movement causing the teeth (4) of said elements to mutually engage in order to close the zip fastener (1) or, alternatively, to mutually disengage in order

to open the zip fastener (1), said toothed elements (2, 3) being disposed along corresponding edges (11) of tapes (10) of textile material connected together at one of their ends. An electrically conductive thread is inserted into each of said tapes (10) during their weaving and each tape (10) is subjected to electrochemical deposition treatment, in order to render each toothed element conductive.



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Description

[0001] The present invention relates to a method for producing an electrically conductive zip fastener, in accordance with the introduction to the main claim. The invention also relates to a zip fastener produced by the method.

[0002] Articles made from electrically conductive fabric are known comprising at least a part formed in two portions which must be closed one against the other in such a manner as to enable the electrical conductivity of the entire structure of such articles to be maintained. An example of these latter is a curtain made of an electrically conductive fabric, said curtain being used to cover electronic equipment which for its correct operation requires screening against external magnetic fields. The electrically conductive fabric enables said screening to be effectively achieved. However, the curtain comprises an openable part presenting the two aforesaid portions which, under certain conditions of use, have to be drawn together and closed one against the other.

[0003] In a curtain of the aforesaid type, electrical continuity must be created between the two portions when these are drawn together and closed, in order to maintain optimum efficiency of the screening created by the curtain. Such efficiency cannot however be validly achieved if the members which enable the portions to be closed together are discrete members such as press studs or the like.

[0004] In the fashion field there is also a requirement for articles of special appearance, for example related to portions provided with self-lighting. For example, there is a demand for articles of clothing with illuminated regions or with representations visible in the dark.

[0005] An object of the present invention is to provide a method for producing a zip fastener enabling electrical connection continuity to be maintained between two separable portions of an article with which two edges of said zip fastener are rigid.

[0006] A particular object of the invention is to provide a method of the stated type which is simple to implement and enables a zip fastener to be obtained having optimal low voltage electrical conductivity characteristics.

[0007] Another object is to provide a zip fastener obtained by the aforesaid method, from which an article can be obtained provided with regions of particular aesthetic merit achieved by passing current through them.

[0008] These and other objects which will be apparent to the expert of the art are attained by a method and a zip fastener in accordance with the accompanying claims.

[0009] The present invention will be more apparent from the accompanying drawing, which is provided by way of nonlimiting example and in which the single figure shows an enlarged partial view of a zip fastener according to the invention.

[0010] With reference to said figures, the zip fastener according to the invention is indicated overall by 1 and

comprises a first toothed element 2 to be coupled to a second toothed element 3. Each toothed element presents a plurality of teeth 4 cooperating with a movable member or slider 5 which, in known manner, causes them to mutually engage (by tightening the two elements against each other to close the zip fastener 1) or disengages them (to open the zip fastener). The tapes 10 of said elements are connected together at a free end thereof, in accordance with known teachings.

[0011] Each of said toothed elements 2, 3 is associated with a tape 10, along an edge 11 thereof the relative toothed element 2, 3 is present.

[0012] According to the invention, into the interior of each tape 10, formed of textile material, there is inserted at least one electrically conductive thread connected to the teeth 4 of the elements 2 and 3. This thread or yarn can be a silver coated thread, a polyester thread surface-clad with carbon, a silver coated polyamide thread or a polyester thread covering a fine metal wire.

[0013] According to the method of the invention, each tape is obtained by weaving it using said electrically conductive yarn or thread, then joining the corresponding toothed element 2, 3 to said tape 10 in known manner, with said toothed element being brought into contact with the electrically conductive thread. Each tape 10 provided with the corresponding toothed element 2, 3 is placed in an electroplating bath to coat the teeth 4 of each element 2, 3 with metal. This process is carried out by a continuous treatment procedure on each tape before closing the zip fastener 1, but can also be carried out by immersing at least partly closed zip fasteners into the electroplating bath.

[0014] The metal deposited on the teeth 4 is preferably nickel or its alloys. Part of this metal will also evidently deposit on the fabric of the tape, this increasing the conductivity of the zip fastener 1.

[0015] On termination of the electrochemical deposition bath procedure, after a necessary period for drying, the electrically conductive zip fastener is ready for use.

[0016] Using the zip fastener obtained in this manner, products can be produced in which two electrically conductive elements can be effectively and continuously connected together along their contacting edges, without this resulting in a decrease in the electrically conductive performance of each portion. In the case, for example, of a curtain used to screen electrical equipment, the use of a zip fastener produced according to the invention enables adequate electrical conductivity characteristics to be maintained throughout the curtain by a continuous electrical connection between two adjacent sides of the openable portions of the curtain.

[0017] As the zip fastener obtained in accordance with the invention is electrically conductive, it can be connected to a suitable low voltage source of electricity able to supply the zip fastener with electrical energy. The zip fastener can be coated with a product or material which increases its luminosity if powered electrically or if subjected to a potential difference. By virtue of this arrange-

ment, articles of clothing can be produced presenting lightable portions or representations which can be provided with a low voltage electrical power source in order to activate illuminated elements which give a particular aesthetic effect to said article of clothing.

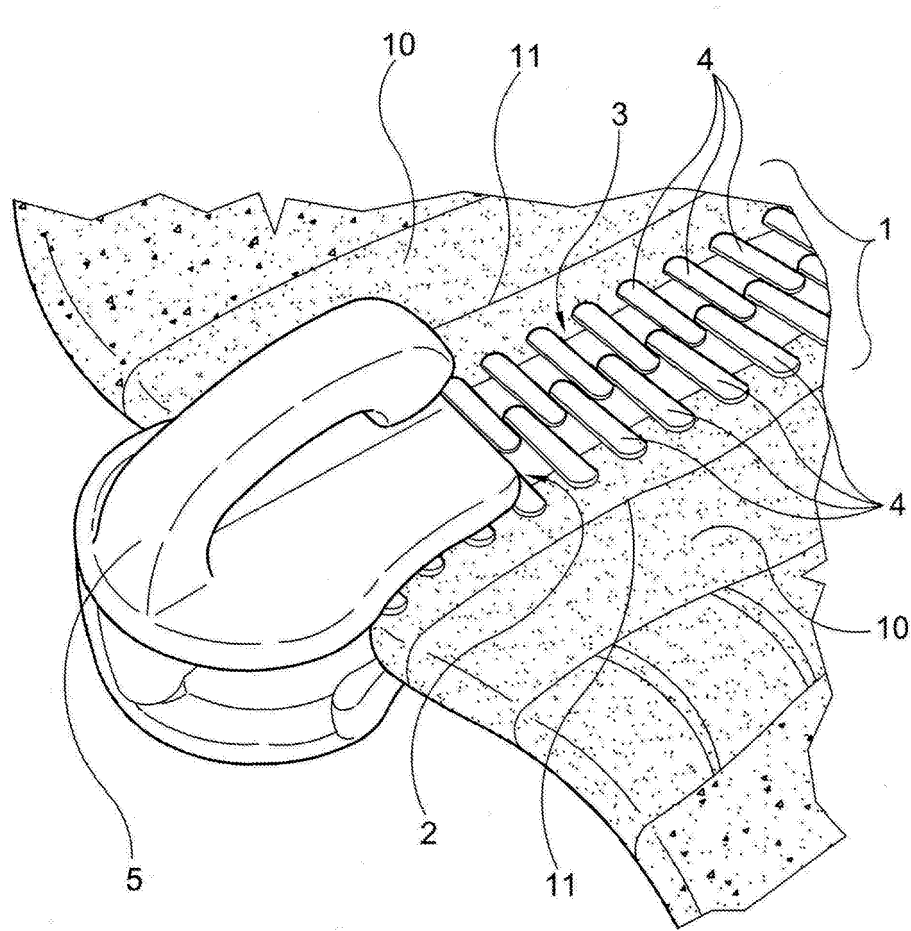
[0018] A specific embodiment of the invention has been described together with some variants thereof. However an expert of the art could devise other embodiments on the basis of the foregoing description, said embodiment therefore falling within the range of the present invention as defined by the accompanying claims.

Claims

1. A method for producing an electrically conductive zip fastener (1), the zip fastener (1) comprising a first toothed element (2) to cooperate with a second toothed element (3), a slider (5) movable between said elements (2, 3), said movement causing the teeth (4) of said elements to mutually engage in order to close the zip fastener (1) or, alternatively, to mutually disengage in order to open the zip fastener (1), said toothed elements (2, 3) being disposed along corresponding edges (11) of tapes (10) of textile material connected together at one of their ends, **characterised by** inserting an electrically conductive thread into each of said tapes (10) during their weaving and by subjecting each tape (10) to electrochemical deposition treatment, in order to render each toothed element conductive. 20
2. A method as claimed in claim 1, **characterised in that** said tapes are continuously immersed into the electrochemical deposition bath. 35
3. A method as claimed in claim 1, **characterised in that** the zip fastener is immersed partly closed into the electrochemical deposition bath. 40
4. A method as claimed in claim 1, **characterised in that** the electrically conductive thread inserted into each tape is brought into contact with the teeth (4) of each element (2, 3) associated with a corresponding tape (10). 45
5. A zip fastener comprising a first and a second toothed element (2, 3), each presenting a succession of teeth (4) arranged to cooperate with a slider (5) movable along said elements (2, 3), said movement causing said teeth (4) to mutually engage in order to close the zip fastener (1) or, alternatively, to mutually disengage in order to open the zip fastener (1), said toothed elements (2, 3) being disposed along opposing edges of tapes (10) of textile material connected together at one of their ends, **characterised in that** each tape (10) comprises at least one thread of elec- 50

trically conductive material, at least each element (2, 3) being electrically conductive.

6. A zip fastener as claimed in claim 5, **characterised in that** the thread inserted into each tape (10) is a silver coated thread or a polyester thread on which a layer of carbon is deposited or a silver coated polyamide thread or a polyester thread covering a fine metal wire. 10
7. A zip fastener as claimed in claim 5, **characterised in that** at least the teeth (4) of the toothed elements (2, 3) are coated with electrically conductive metal. 15
8. A zip fastener as claimed in claim 7, **characterised in that** the electrically conductive metal is nickel or its alloys. 25





European Patent
Office

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Application Number
EP 06 11 3361

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Place of search Munich		Date of completion of the search 20 September 2006	Examiner Horubala, Tomasz
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