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(54) Marker for an elongate object

(57) The marker (10) for a wire, cable or the like elongate object, comprises a resilient film (12) in the form of a roll (13) having an outer diameter and at least one overlapping winding layer, the film comprising an inner end section (14) within the roll (13) and an outer end section (16) at an outer side of the roll (13) defining an indicia region (38) for receiving indicia. The outer end section (16) comprises a first portion (28) and at least one second portion (30). The first portion (28) extends away from the outer side of the roll (13) at an angle of at least 90° with respect to a radial dimension of the roll (13). The at least one second portion (30) extends within a plane in or parallel to a tangential dimension of the roll (13). The indicia region (38) is arranged within at least one of the second portions of the outer end section (16) of the film (12).

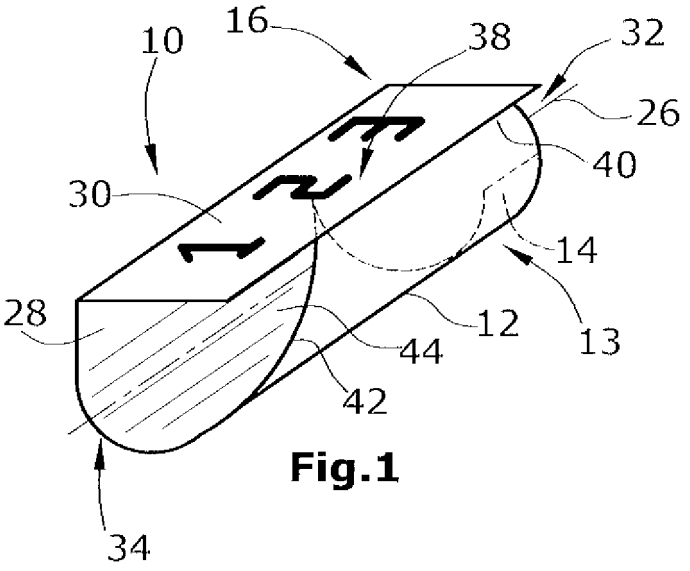

Fig.1

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a marker for at least one elongate object. In particular, the present invention relates to a marker for at least one wire cable, tube, pipe or hose which marker provides an improved possibility for generating an indicia region. The marker of the present invention can also be used for a group of elongate objects like e.g. a bundle of wires or cables such as wire harnesses.

Description of the Prior Art

[0002] Wire or cable markers, as well as markers for other elongate objects, are basically known. Such markers are used to identify the object to which they are applied, *e.g.*, a wire or cable. A marker may, for example, be colored. It is also desirable in some situations to have markers providing the possibility of identifying an object by characters or other printed or applied indicia.

[0003] Known markers for wires, cables or the like elongate objects comprise a spring elastic film of, *e.g.*, plastic material in the form of a roll comprising a plurality of windings. Examples of this kind of marker can be found in DE-A-35 27 633, EP-B-0 027 026, EP-B-0 251 605, EP-B-0 366 873, US-A-2 629 953, US-A-2 929 161, US-A-4 782 612, US-A-5 360 584, and US-A-5 711 836. Due to the cylindrical shape of the known markers, the characters or other signs necessary for identification have to be applied to the outer curved face of the markers which makes is difficult to read or recognize the characters or other signs.

[0004] A marker in roll form is disclosed in GB-A-928 752. This marker comprises two sections, a first section in a roll form and a second section extending tangentially away from the roll. Within the tangential section indicia characters or signs can be applied to the marker. However, in particular if the objects to be marked are arranged close to each other like wires or cables in an electrical control cabinet, the tangentially extending outer sections provide an obstacle and may therefore cover or otherwise obscure indicia provided on adjacent markers.

[0005] Another cable marker in roll form is known from EP-B-0 366 873. This marker comprises a C-shaped sleeve having inclined or oblique edges for improving and enhancing the application of the C-shaped sleeve to a cable. The marker is provided with a flat outer surface area which serves as an indicia region. This flat area, however, complicates the manufacturing of the marker because within this area the marker is provided with a slot or channel for receiving a strip of paper or like material to which the identification characters are printed. The marker is insert molded which also generally leads to increased manufacturing costs.

[0006] Holding loops for cables are disclosed in US-A-3 847 721, US-A-3 899 807, and US-A-3 988 399. These holding loops are made from a heat recoverable sheet of plastic film which can be wrapped around cables or the like elongate articles. While application of the known heat recoverable articles is facilitated, the articles do not provide a region or area within which characters or the like identifications signs can be applied.

[0007] Accordingly, there is a need in the prior art for an identification marker for a wire, cable or the like elongate object which provides an indicia region for receiving easily recognizable indicia.

[0008] Another problem with known markers is their application to an elongate object like e.g. a wire, cable or the like elongate object. Markers in roll form are not convenient when they have to be applied to an object from a lateral side. Namely, inserting the elongate object between the outer end section at the outer winding of the roll and the remainder of the roll is difficult and requires some manual skill. Therefore, for example, the C-shaped cable marker disclosed in EP-B-0 366 873 is provided with inclined or oblique edges to improve the application of the marker to the cable which, however, is not easy because the C-shaped marker has to be tilted when applying it to the cable.

[0009] Markers which are automatically wound around an object are disclosed in GB-A-928 752, EP-B-0 251 605, and US-A-5 360 584. These markers require heat recoverable portions which when wound up in roll form are heat-stable and which when extending as a strip for applying to the object are heat-unstable. The manufacturing of these known markers is complicated and requires additional efforts. Also during storage of these known markers one has to take care to avoid subjecting the markers to heat.

[0010] Accordingly, another need in the field of markers for elongate objects like e.g. wires or cables, is a marker which can be easily applied to the object, in particular when there is given only limited access to the object.

SUMMARY OF THE INVENTION

[0011] The invention provides a marker for an elongate object (*e.g.*, a wire, cable or other like object) or a group of elongate objects, comprising:

- a film in the form of a roll having an outer diameter and at least one overlapping winding layer, the film comprising an inner end section within the roll and an outer end section at an outer side of the roll defining an indicia region for receiving indicia,
- wherein the outer end section comprises a first portion and at least one second portion,
- wherein the first portion extends away from the outer side of the roll at an angle of at least 90° with respect to a radial dimension of the roll,
- wherein the at least one second portion extends with-

in a plane in or parallel to a tangential dimension of the roll, and

- wherein the indicia region is arranged within at least one of the second portions of the outer end section of the film.

[0012] In accordance with one embodiment of the present invention the marker comprises a film made of a plastic or other flexible material and arranged in roll form, having an outer diameter and at least one overlapping winding layer. The film is generally resilient, i.e. it is generally spring-elastic. The film has the shape of a strip which is wound up as a roll. The width of the strip, *i.e.,* the dimension of the strip in the axial direction of the roll, defines the width of the roll while the length of the strip defines the diameter as well as the number of overlapping winding layers. The film comprises an inner end section within the roll and an outer section at an outer side of the roll. Within the outer section an indicia region for receiving indicia is defined.

[0013] The outer end section comprises at least two portions, namely a first portion and at least one second portion. Within its first portion the outer end section extends away from the outer side of the roll in a direction extending between the tangential direction and the radial direction of the roll. The at least one second portion extends within a plane in or parallel to the tangential dimension of the roll. The indicia region is arranged within this at least one second portion or within at least one of the second portions of the outer end section of the film.

[0014] Accordingly, within the indicia region the film is substantially planar, *i.e.*, extends in a plane. This indicia region preferably has a dimension substantially perpendicular to the radial dimension of the roll which substantially corresponds to the outer diameter of the roll or exceeds the outer diameter. In the latter case it is preferred that the extension of the indicia region beyond the outer diameter of the roll is symmetrical at both sides of the outer diameter.

[0015] By the provision of a substantially flat (*i.e.,* substantially uncurved or merely slightly curved) second portion at the outer end section of the film, indicia characters or other identification signs can be applied to the indicia region and be easily recognized. Also the dimension of the indicia region can be designed substantially as large as the outer diameter of the roll without the necessity that, within the indicia region, the outer end section of the film extends beyond the roll. Accordingly, even if the objects to be marked are arranged close to each other, the individual markers do not interfere and, in particular, do not cover their respective indicia regions.

[0016] Typically, the first portion of the outer end section is arranged adjacent the at least one second portion. More preferably, these two portions extend at substantially a right angle. In other words, it is preferred that both the first and second portions extend substantially tangentially. In one embodiment of the invention, the angle between both portions preferably can be 90° or as an alternative lie between 65° and 125° and preferably be about 85°. Thus, as an alternative to a substantially right angle between the first and second portions, this angle can also be acute or obtuse.

[0017] Between the first and second portions there can also be arranged an intermediate portion, in particular an intermediate portion can be arranged between the first portion and that one of the second portions which is provided with the indicia region.

[0018] In another embodiment, the first portion of the outer end section extends within a plane or is curved in a direction opposite to a winding direction of the roll. Accordingly, the first portion extends away from the roll and is bent with the second portion carrying the indicia region adjacent to the first portion. Since the first portion is bent or curved in a direction opposite to the winding direction of the roll, the second portion defining the indicia region may extend to both lateral sides of the roll in order to increase this region for indicia purposes.

[0019] As already stated above, the indicia region is located within at least one of the second portions. The indicia region can be arranged in the second portion closest to the first portion or in the second portion farthest away from the first portion. Both alternatives function adequately in that the respective second portion extends substantially in a plane parallel to or in the tangential dimension of the roll.

[0020] The provision of the indicia region in a substantially tangential plane or direction or a plane substantially parallel to such a plane or direction guarantees maximization of the size of the indicia region perpendicular to the radial dimension of the roll without the necessity that the outer end section within the indicia region extend beyond the roll at both lateral sides. However, nevertheless the second portion of the outer end section of the roll may extend beyond at least one lateral side of the roll, i.e. can be larger than the outer diameter of the roll. Also within the second portion, the film may have a width, i.e. a dimension in the axial extension of the roll which is larger than the axial dimension of the remainder of the roll. As a further alternative the second portion can be smaller than the axial dimension of the remainder of the roll.

[0021] The marker of the present invention can be used for marking individual elongate objects (e.g. wire, cable, tube or hose) as well as groups or bundles of elongate objects like e.g. wire harnesses. The outer contour of the elongate object or group of elongate objects to be marked by the marker is not critical for the invention.

[0022] Due to the elasticity of the film, the roll is spring-elastic i.e. is recoverable when the elongate object during application of the marker is arranged between the outer winding and the remainder of the roll,

[0023] With respect to an easier application of the marker roll to the elongate object it is useful if the film, at one of its edges extending between the inner and outer end sections, is inclined, oblique, or in a different manner deviates from a perpendicular extension to the winding axis of the roll. These two edges of the film which extend

between the inner and outer sections of the film define the axial ends of the roll, *i.e.,* the ends of the roll when the film is wound up. The deviation of one of the edges of the film from an extension perpendicular to the winding axis of the roll facilitates an easy application of the roll to an elongate object after the roll has been applied to the elongate object. The narrowing width of the film within or adjacent its outer end section results in a lateral gap at one of the axial ends of the roll, which gap is also open on the axial end, thus facilitating the attachment of the marker to the elongate object so that the same is inserted between the outer end section of the film and the remainder of the roll. Namely, thereafter, by slightly tilting the roll with respect to the elongate object, the roll can be pulled with the elongate object sliding along the respective edge of the film deviating from the perpendicular direction with respect to the winding axis. This process can be continued until the inner end section of the film is wrapped around the elongate object. Thereafter, by releasing the outer end section of the film and/or moving the elongate object back towards the outer end section of the film, the film is automatically wrapped around the elongate object. Since at least one of the edges of the film defining the axial ends of the roll deviates from the dimension perpendicular to the winding axis of the roll, this edge of the film does not extend in one single radial plane with respect to the winding axis of the roll, which facilitates unwinding of the film by moving the film and the elongate object relative to each other by simultaneously sliding the film with its respective edge along the elongate object.

[0024] Accordingly, in the embodiment as discussed above, the marker according to the invention comprises:

- a film in the form of a roll having a winding axis and an outer diameter and at least one overlapping winding layer, the film comprising (1) an inner end section having a free end arranged within the roll and (2) an outer end section having a free end arranged at an outer side of the roll,
- wherein the roll comprises two axial ends defined by edges of the film extending between its inner and outer end sections, and
- wherein, when the film is unwound, the extension of at least a portion of at least one of the edges of the film forming at least one of the axial ends of the roll deviates from an extension perpendicular to the winding axis of the roll.

[0025] The marker according to this embodiment can be used for marking an elongate object like e.g. a wire, cable, tube or hose (or a group of such objects), by performing the following steps:

- applying the marker to the elongate object such that the elongate object is inserted between the outer end section of the film and the remainder of the roll such that the axial extensions of both are arranged in a common plane,
- tilting the marker and the elongate object with respect to each other while maintaining (i) the elongate object between the outer end section of the film and the remainder of the roll and (ii) the axial extensions of the elongate object and the remainder of the roll substantially in the common plane,
- retaining the outer end section of the film while moving the elongate object laterally away from the outer end section and along the edge of the film deviating from the extension perpendicular to the wounding axis of the roll so as to unwind the roll until the inner end section of the film is wrapped around the elongate object, and
- releasing the outer end section of the film and/or moving the elongate object back towards the outer end section of the film, such that the film is wrapped around the elongate object with the same arranged within the roll.

[0026] The edge of the film forming one of the axial ends of the roll and deviating from the direction perpendicular to the winding axis of the roll preferably is linear or at least partially linear and extends at an inclination or obliquely so that the inner end section of the roll has a dimension extending in the winding direction which is smaller than the respective dimension of the outer end section of the film, As an alternative to an at least partially linear extension of the respective edge of the film, that edge of the film can also be curved, corrugated or can have polygonal sections. The curvature can be such that the edge extends to one of the two lateral sides of an inclined dimension or extension. The corrugated edge extends at both sides of an inclined dimension or extension of the respective edge. All of these embodiments of the shape of the respective edge of the film help to facilitate automatic unwinding of the film as described above when applying the marker and moving the marker and the elongate object relative to each other after application of the marker.

[0027] In order to provide the maximum width for the indicia region which is defined by the axial dimension of the roll, the edges of the film within at least that second portion of the outer section of the film within which the indicia region is located, extend perpendicular to the winding axis of the roll. Accordingly, in the embodiment of the marker having a film with an edge deviating from the perpendicular dimension with respect to the winding axis of the roll, the outer end section has a width larger than that of the inner end section. The inner end section and, in particular, that edge of the inner end section defining its free end can also have no dimension at all, i,e. is a tip, meaning that the film at its inner end section has, *e.g.,* a triangular shape (*i.e.,* extends so as to form a tip corner at its inner end).

[0028] In another embodiment of the invention, the extensions of both ends of the film forming the two axial ends of the roll deviate from an extension perpendicular

to the winding axis of the roll. In this embodiment the user can decide depending on his or her manual skill along which one of these two edges he or she would like to move a film relative to the wire, cable or the like elongate object. Both edges allow for an improved application method for applying the marker to the wire, cable or the like elongate object.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] A full and enabling disclosure of the present invention, including the best mode thereof, enabling one of ordinary skill in the art to carry out the invention, is set forth in greater detail in the following description, including reference to the accompanying drawing in which

Fig. 1 is an isometric view of a wire marker according to a first embodiment,

Fig. 2 is a side view of the marker of Fig. 1,

Fig. 3 is a plan view of the resilient plastics film in its unwound condition having one edge extending obliquely,

Figs. 4 to 7 are plan views of a resilient plastics film having differently shaped edge configurations and which can be used as an alternative to the resilient film shown in Fig. 3,

Fig. 8 is an isometric view of a wire marker according to an alternative embodiment,

Fig. 9 is a side view of the marker according to Fig. 8,

Fig. 10 is an isometric view of a wire marker according to a third embodiment,

Fig. 11 is a side view of the marker according to Fig. 10,

Fig. 12 is an isometric view of a wire marker according to a fourth embodiment,

Fig. 13 is a side view of the marker according to Fig. 12,

Fig. 14 is an isometric view of a wire marker according to a fifth embodiment,

Fig. 15 is a side view of the marker according to Fig. 14,

Fig. 16 is an isometric view of a wire marker according to a further embodiment,

Fig. 17 is a side view of the marker according to Fig. 16,

Fig. 18 shows the situation prior to the application of a marker to a wire while the wire is held in one hand and the marker is held in the other hand,

Fig. 19 shows the situation at the beginning of the application of the marker to the wire,

Fig. 20 shows the situation where the wire is completely inserted between the outer end section of the film and the remainder of the roll such that the outer end section and the roll are located at opposite lateral sides of the wire,

Fig. 21 illustrates the process of pulling the marker away from the wire while tilted with respect to the wire wherein the marker is supported by one finger of one hand and slightly forced against the wire and the marker with its one inclined edge forming one of the axial ends of the roll is guided along the wire,

Fig. 22 shows the situation in which the roll is nearly completely unwound with its inner end section automatically winding and snapping around the wire generating a more or less noticeable sound indicating that the inner-most end section of the film is wrapped around the wire, and

Fig. 23 is a view of the marker completely attached and wound around the wire.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0030] In Figs. 1 to 3 a first embodiment of a marker 10 for an elongate object is shown. This embodiment of the marker as well as the other embodiments of the invention will be described in the following with respect to their application for marking a wire. Those skilled in the art will clearly recognize that the marker according to the invention can also be used for marking other elongate objects.

[0031] The marker 10 according to Fig. 1 comprises a spring-elastic film 12 made of a synthetic material. The film 12 is wound as a roll 13 which in this condition is mechanically stable. In this embodiment of the invention, the film 12 in its unwound condition has an overall shape as shown in Fig. 3. In particular, the film 12 comprises an inner end section 14 and an outer end section 16 and two edges 18,20 extending between the inner and outer end sections 14,16. The free ends of the inner and outer end sections 14,16 are defined by further edges 22,24 of the film 12 which extend parallel to the winding axis

26 of the wound film 12, i.e. of the marker 10. Within its outer end section 16, the film 12 comprises a first portion 28 and a second portion 30, both extending tangentially to the roll 13 as can be seen in particular in Figs. 1 and 2. In this embodiment, the marker 10 comprises a substantially right angle between the first and second portions 28,30 of the outer end section 16 of the film 12. The two edges 18,20 form the axial ends 32,34 of the marker 10.

[0032] As can be seen in particular from Figs. 1 and 2, due to the first portion 28 of the outer end section 16 extending tangentially, the width 35 of the second portion 30 of the outer end section 16 of the film 12 can extend substantially along the complete outer diameter 36 of the marker 10, resulting in a relatively large and substantially flat area defining an indicia region 38 for receiving indicia so as to identify the wire to which the marker 10 is applied. Within the indicia region 38 there can be provided an adhesive tag or the like indicia receiving element. As an alternative, the indicia character or indicia signs can be directly printed to the second portion 30 of the outer end section 16 of the resilient film 12. Also, in addition or as a further alternative, the indicia region can be provided with a color code for identifying the wire or cable the marker 10 is used with.

[0033] The film 12 typically is extruded so as to from a sheet-like material or web. In one example, the plastic film is a polycarbonate (or "PC") film or strip cut from a layer of a PC film The PC film is cut so as to generate the shape as shown in Fig. 3. Thereafter, the PC film is wound up, forming a substantially right angle between the first and second portions 28,30 of the outer end section 16 of the marker 10. The film 12 is held in this shape as shown in Figs. 1 and 2 and heat is applied to the film 12 such that a thermal forming process takes place, resulting in the shape of the marker 10 as shown in Figs. 1 and 2 wherein this shape of the marker 10 is structurally stable under the normal environmental conditions that the marker is subjected to during use or storage. The thickness of the PC film preferably should be less than 250 μm and, in particular, less than 100 μm and, most preferably, is between 125 μm and 175 μm. Basically, the thickness of the film 12 is not critical for the invention.

[0034] Instead of using a PC film, other polymeric and/or thermoplastic materials can be used for the film 12, The length of the film 12, i.e. its extension between its inner and outer end sections, can be chosen depending on the desired diameter of the marker 10 which in turn depends on the wire and the outer diameter of the wire to be marked by the marker 10. Also the length of the film 12 should be chosen such that the marker 10 comprises at least one overlapping winding layer. In the embodiment according to Figs. 1 and 2 the marker 10 comprises nearly 1 ¾ overlapping winding layers.

[0035] The width of the film 12 at its outer end section 16 is determined by the desired length of the indicia region within the second portion 30 of the outer end section 16 of the film 12. The width of the film 12 at its outer end section 16 defines the axial dimension of the marker 10.

[0036] As shown in Fig. 2, a gap 40 is formed between the second portion 30 of the outer end section 16 and the remainder of the film 12 wound as a roll 13. The gap 40 serves as an insertion gap facilitating application of the marker 10 to a wire as will be explained later with reference to Figs. 18 to 23.

[0037] Also the specific shape of one of the edges 18,20 of the film 12 defining the axial ends 32,34 of the marker 10 serves for a better insertion of the wire into the marker 10 when applying the same to the wire. In the embodiment of Figs. 1 to 3, the edge 20 of the film 12 comprises an oblique or inclined section 42 extending between the outer end section 16 and the inner edge 22 of the film 12. The linear and oblique edge portion 42 results in a helical extension when the film 12 is wound into a roll 13. This is shown in Fig. 1. The distance between the inclined edge portion 42 and the edge 24 of the film 12 is less than the circumference of the roll 13, and, preferably, lie between 1/2 and ¾ of the circumference. By this design, an additional gap 44 is formed at the transition between the lateral side of the marker 10 and one of its axial ends (axial end 32 in this embodiment). This additional insertion gap 44 provides for a better insertion of the wire into the marker 10 upon application of the same to the wire as will also be explained later.

[0038] Figs. 4 to 6 show alternative extensions of the edge portion 42 at the edge 20 of the film 12. As far as the edges and parts of the embodiments of the film 12 shown in Figs. 4 to 6 are identical or similar to the respective edges and parts of the film 12 of Fig. 3, the same reference numerals are used in Figs. 4 to 6.

[0039] In Fig. 4 the edge portion 42 is bent or curved inwardly while in Fig. 5 the edge portion 42 is outwardly or convexly curved. In both cases the overall extension of the edge portion 42 is oblique to the inner and outer edges 22,24 of the film 12 which edges are parallel to the winding axis 26 of the marker 10. Fig. 6 shows a corrugated or wave shaped extension of the edge portion 42.

[0040] Finally, Fig. 7 shows an embodiment of the cut film 12 in which both edges 18 and 20 forming the axial ends 32 and 34 of the marker 10 are oblique or inclined, i.e. deviate from a dimension perpendicular to the winding axis 26 which is shown in dotted lines in Fig. 7 as well as in Figs. 3 to 6, For this embodiment it is not critical that both edges 18 and 20 have the same or symmetrical shape. In contrast thereto, the edges can have different shapes.

[0041] All of the embodiments of the cut film 12 shown in Figs. 3 to 7 are provided with at least a portion at one or both of its edges 18,20 which portion deviates from the perpendicular direction with respect to the winding axis 26. This configuration of the respective edge portion 42 results in one or more additional insertion gaps 44 as explained above in connection with Fig. 1 and the embodiment of the marker 10 of Figs. 1 to 3. Also, as indicated by dotted lines in Figs. 3 to 7, at the inner end

section 14 of the film 12 there can be provided a rectangular end portion 46. Furthermore, as additionally indicated in Figs. 3 and 7, a triangular end portion 48 can be arranged at the inner end section 14 of the film 12. Finally, as also indicated in dotted lines in Figs. 5 and 6, the curved edge section 42 can be extended until intersecting the opposite edge 18 of the film 12.

[0042] Alternative embodiments for the marker 10 are shown in Figs. 8 to 17 wherein Figs. 8, 10, 12, 14, and 16 show perspective views of the individual alternative embodiments while Figs. 9, 11, 13, 15, and 17 depict views of the front axial ends of the alternative markers shown in Figs. 8, 10, 12, 14, and 16, respectively.

[0043] The individual embodiments of the markers 50, 60, 70, 80, and 90 in Figs. 8 to 17 differ from the marker 10 shown in Figs. 1 and 2 with respect to the orientation and shape of the outer end sections of the resilient films. For elements of the markers of Figs. 8 to 17 which are identical or similar to elements of the marker 10, the same reference numerals as in Figs. 1 to 3 are used in Figs. 8 to 17.

[0044] The outer end section 16 of the marker 50 comprises a first portion 28 which with respect to the radial dimension 52 of the roll 13 of the film 12 is arranged at an angle less than 90° while the angle between the first portion 28 and the second portion 30 carrying the indicia region 38 is less than 90°. By this design the width 35 of the second portion 30 of the outer end section 16 of the film 12 can be increased whereby the second portion 30 extends at both lateral sides beyond the outer diameter 36 of the roll 13 of the film 1.2.

[0045] In Figs. 10 and 11 the marker 60 forms an obtuse angle between the first and second portions 28,30 of the outer end section 16 of the film 12. The first portion 28 again extends tangentially.

[0046] In Figs. 12 and 13 a marker 70 is shown having an outer end section 16 comprising an additional intermediate portion 72 between the first and second portions 28,30. Similar to the embodiment of the marker 10 according to Figs. 1 and 2, also the marker 70 comprises a first portion 28 extending substantially tangentially. The first portion 28 is followed by the intermediate portion 72 which is angled at substantially 90° and extends outwardly with respect to the winding axis 26 of the roll 13 of the film 12. The second portion 30 is connected to the intermediate portion 72 and is bent back with respect to the intermediate portion 72 by 180°. Also by this arrangement, a second portion 30 having an increased width 35 is provided; the larger width might be useful to have more space for printing or applying indicia to the marker 70.

[0047] Figs. 14 and 15 show a marker 80 which is similar to the marker 70 of Figs. 12 and 13 except for the first and intermediate portions 28 and 72 being replaced by a first portion 28 bent outwardly, i.e. opposite to the winding direction of the roll 13 of film 12. The second portion 30 of the outer end section 16 of the film 12 again has an increased width 35 due to its extension beyond the outer diameter of the roll 13 of film 12.

[0048] Finally, a last embodiment of a marker 90 is shown in Figs. 16 and 17. This marker 90 comprises an outer end section 16 having an additional second portion 92 following the first second portion 30. The overall shape of the marker 90 is similar to that of the marker 10 of Figs. 1 and 2 except for the additional portion 92 which extends at substantially a right angle with respect to the other second portion 30. The additional second portion 92 substantially extends parallel to the first portion 28 and due to its angled orientation with respect to the second portion 30 provides some stiffness thereto. Depending on the tangential extension of the additional second portion 92 the same can be supported by the remainder of the roll 13. An indicia region can be arranged within the one of the second portions 30 and 92 or within both of them.

[0049] Figs. 18 to 23 illustrate the individual step performed when applying the marker according to the invention to a cable 100 which is already completely installed and electrically connected within e.g. a electrical control cabinet. The wire may be held by one hand 102 of a user who in his or her other hand 104 holds a wire marker which in this embodiment is the wire marker 10 shown in more detail in Figs, 1 to 3.

[0050] As pointed out earlier, the marker 10 as well as the alternative markers shown in the other Figures are provided with an insertion gap 44 close to its axial end 34. This insertion gap 44 helps to push the marker 10 laterally onto the cable 100. When pushing the marker 10 onto the wire 100, the orientation, i.e. the axial dimension 26 of the marker 10, is inclined with respect to the extension of the wire 100 (see Fig. 19).

[0051] Thereafter, the marker 10 is pressed completely onto the wire 100 so that the wire 100 is placed between the second portion 30 of the outer end section 16 of the marker 10 and the remainder of the roll 13 of film 12. This situation is shown in Fig. 20. The orientations of the marker 10 and cable 100 are substantially the same.

[0052] Thereafter, the marker 10 is pulled away from the wire 100 with the marker 10 being tilted relative to the cable 100 and supported by one finger of the hand 104. While pulling the marker 10 in that way, the roll 13 of the film 12 is unwound, with the edge portion 42 being guided along the wire 100 such that both substantially form an angle of about 90°.

[0053] This process is continued until the inner end portion 14 due to the resiliency of the film 12 will automatically snap around the wire 100 as shown in Fig. 22. This phenomenon may, depending on the specific properties of the material selected for the design of the film (like e.g. stiffness, spring--elasticity, thickness), be accompanied by a more or less noticeable snapping or clicking sound indicating to the user that the inner end section 14 is snapped around the wire 100.

[0054] Thereafter, as shown in Fig. 23, the marker 10 can be released or can be controllably pushed back towards the cable 100 so that the film 12 will automatically wrap around the wire 100.

[0055] Although the invention has been described and

illustrated with reference to specific illustrative embodiments thereof, it is not intended that the invention be limited to those illustrative embodiments. Those skilled in the art will recognize that variations and modifications can be made without departing from the true scope of the invention as defined by the claims that follow. It is therefore intended to include within the invention all such variations and modifications as fall within the scope of the appended claims and equivalents thereof.

Claims

1. A marker for one or more elongate objects, comprising:

- a film (12) in the form of a roll (13) having an outer diameter (36) and at least one overlapping winding layer, the film comprising an inner end section (14) within the roll (13) and an outer end section (16) at an outer side of the roll (13) defining an indicia region (38) for receiving indicia,
- wherein the outer end section (16) comprises a first portion (28) and at least one second portion (30),
- wherein the first portion (28) extends away from the outer side of the roll (13) at an angle of at least 90° with respect to a radial dimension (52) of the roll (13),
- wherein the at least one second portion (30) extends substantially within a plane in or parallel to a tangential dimension of the roll (13), and
- wherein the indicia region (38) is arranged within at least one of the second portions (30) of the outer end section (16) of the film (12).

2. The marker according to claim 1, wherein the at least one second portion (30) of the outer end section (16) is arranged adjacent to the first portion (28).

3. The marker according to claim 1, wherein an intermediate portion (72) of the outer end section (16) is arranged between its first portion (28) and its at least one second portion (30).

4. The marker according to any one of claims 1 to 3, wherein the at least one second portion (30) of the outer end section (16) extends at substantially a right angle with respect to the first portion (28).

5. The marker according to any one of claims 1 to 4, wherein the first portion (28) and the at least one second portion (30) of the outer end section (16) form an acute or obtuse angle.

6. The marker according to any one of claims 1 to 5, wherein the first portion (28) of the outer end section (16) is curved in a direction opposite to a winding direction of the roll (13) and wherein the at least one second portion (30) of the outer end section (16) is connected to the first portion (28) thereof.

7. The marker according to any one of claims 1 to 5, wherein the first portion (28) of the outer end section (16) extends within a plane.

8. The marker according to claim 7, wherein the first portion (28) and the at least one second portion (30) of the outer end section (16) both extend tangentially with respect to the roll (13).

9. The marker according to any one of claims 1 to 8, wherein the outer end section (16) comprises a further second portion (92) extending in a plane in or parallel to a tangential dimension of the roll (13) and wherein the indicia region (38) is located within at least one of the second portions (30,92).

10. The marker according to any one of claims 1 to 9, wherein the roll (13) comprises two axial ends (32,34) defined by edges (18,20) of the film (12) and wherein, when the film (12) is unwound, the extension of at least a portion (42) of at least one of the edges (18,20) of the film (12) forming at least one of the axial ends (32,34) of the roll (13) deviates from an extension perpendicular to the winding axis (26) of the roll (13).

11. The marker according to claim 10, wherein an inner edge (22) of the resilient film (12) forming the inner free end of its inner end section (14) is smaller than an outer edge (24) of the film (12) forming the outer free end of its outer end section (16).

12. The marker according to claim 10 or 11, wherein the at least one edge (20) of the film (12) forming the at least one axial end (32,34) of the roll (13) is at least partially linear, curved, corrugated, or polygonal.

13. The marker according to any one of claims 10 to 12, wherein, when the resilient film (12) is unwound, the extensions of both edges (18,20) of the film (12) forming the two axial ends of the roll (13) deviate from an extension perpendicular to the winding axis (26) of the roll (13).

14. The marker according to any one of claims 10 to 13, wherein the at least one edge (18,20) of the film (12) deviating from an extension perpendicular to the winding axis (26) of the roll (13) is oriented so as to narrow the film (12) towards its inner end section (14) wherein the narrowing starts within the outer end section (16) of the film (12) or close thereto such that prior to completion of an outer winding of the film (12) the edge (18,20) of the film (12) is axially displaced from the respective axial end (32,34) of

the roll (13), generating a gap (44) located within the outer winding and laterally open as well as open towards the axial end (32,34) of the roll (13).

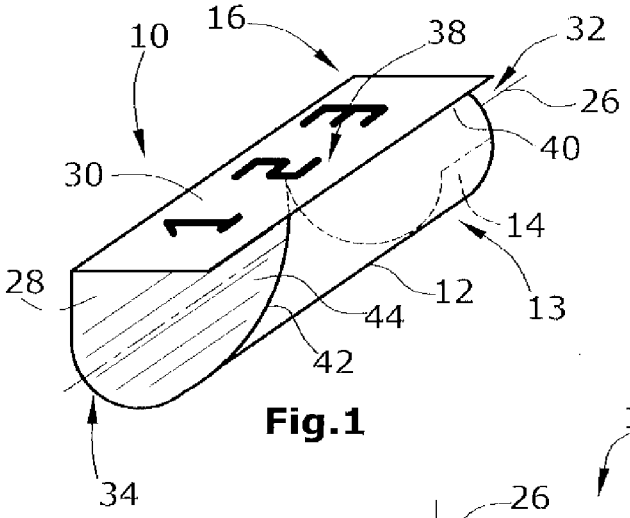

Fig.1

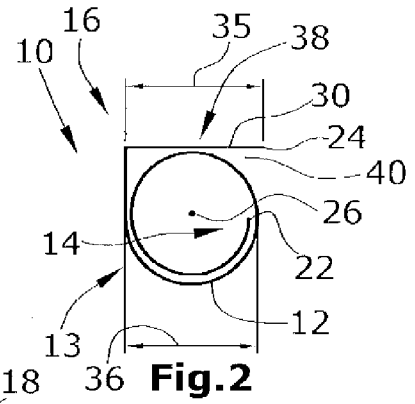

Fig.2

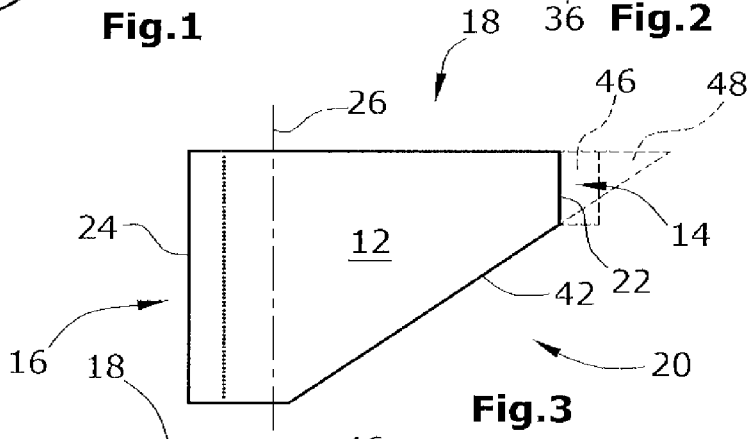

Fig.3

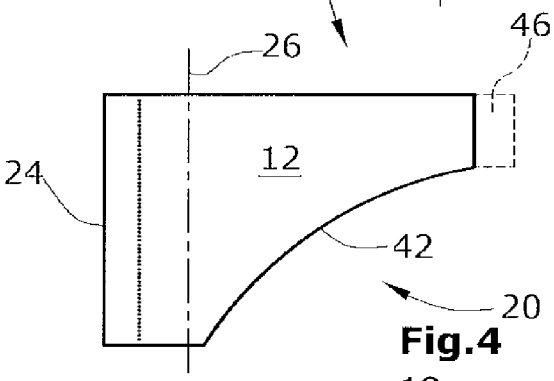

Fig.4

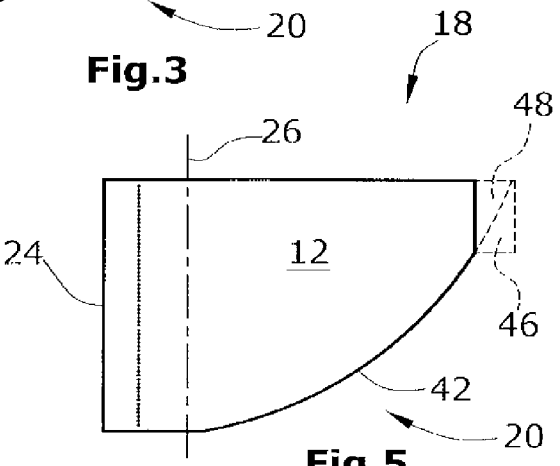

Fig.5

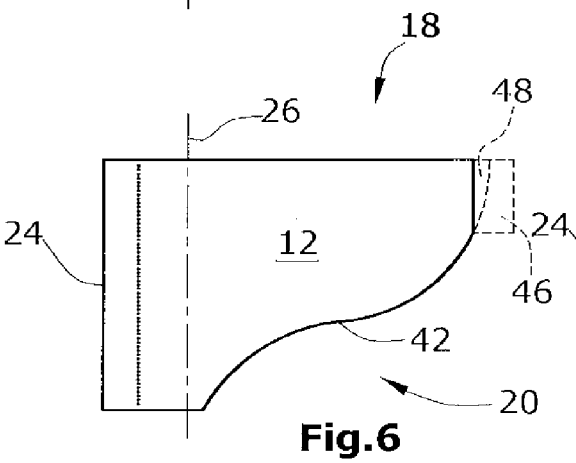

Fig.6

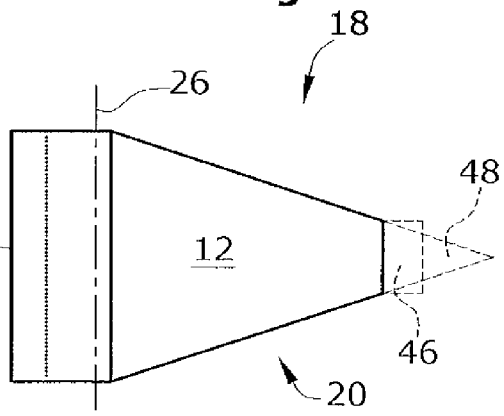

Fig.7

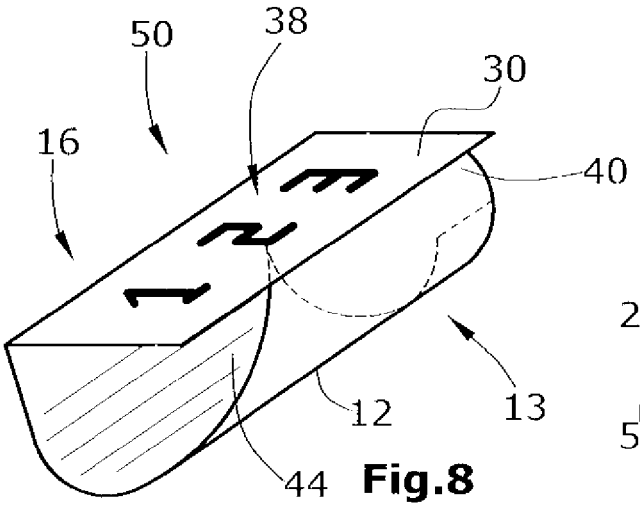

Fig.8

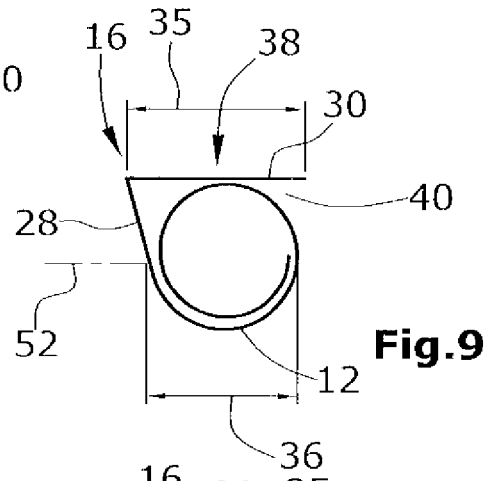

Fig.9

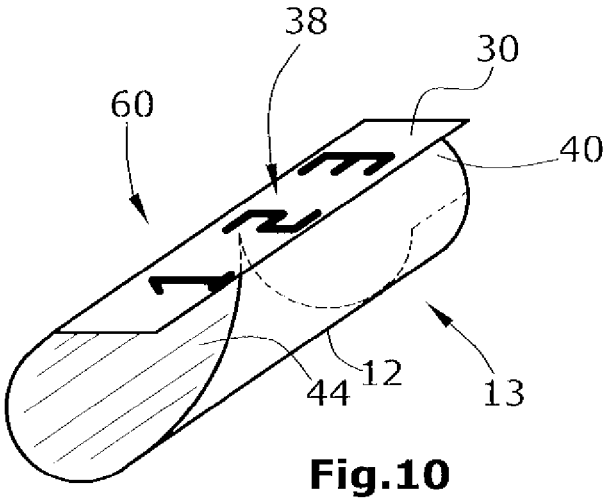

Fig.10

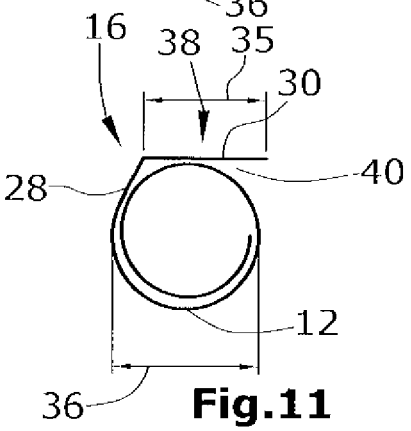

Fig.11

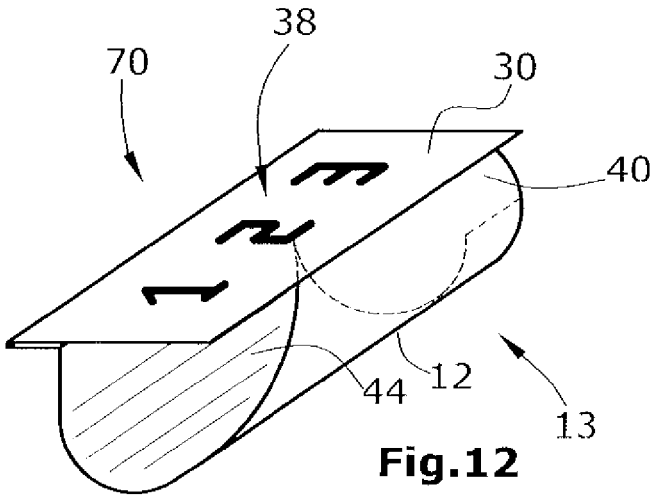

Fig.12

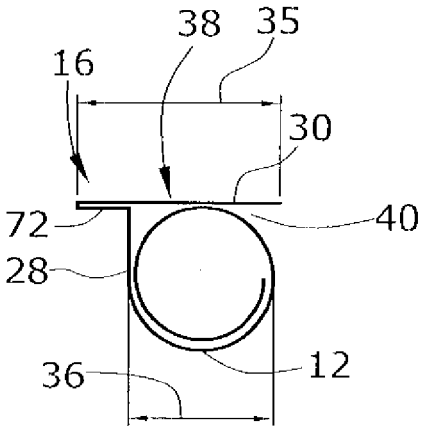

Fig.13

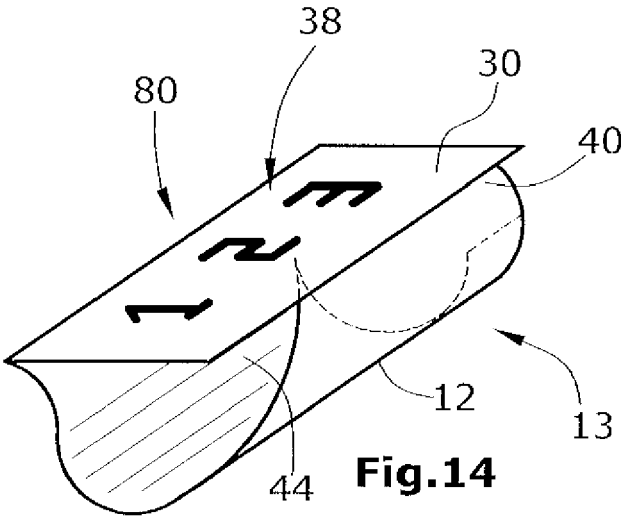

Fig.14

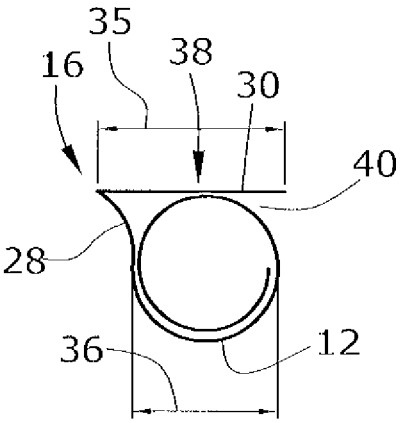

Fig.15

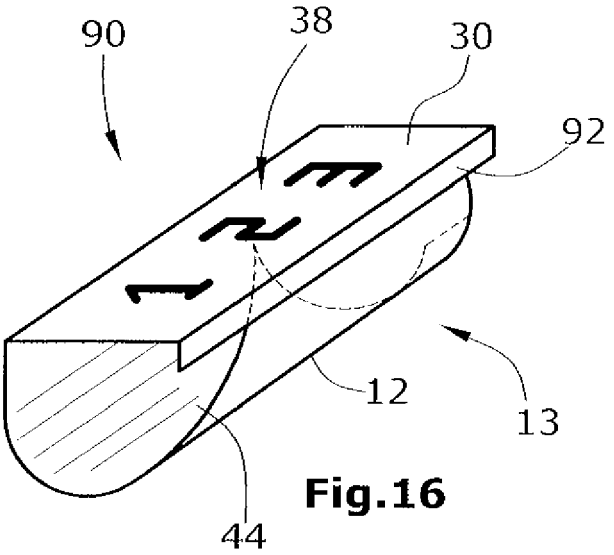

Fig.16

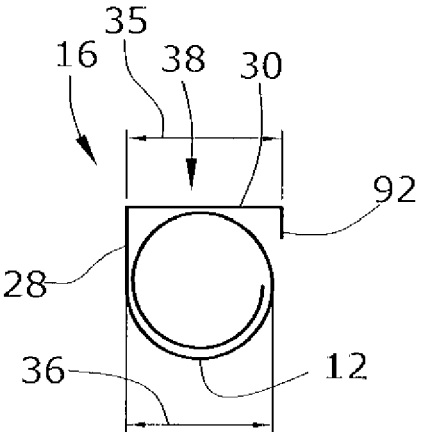

Fig.17

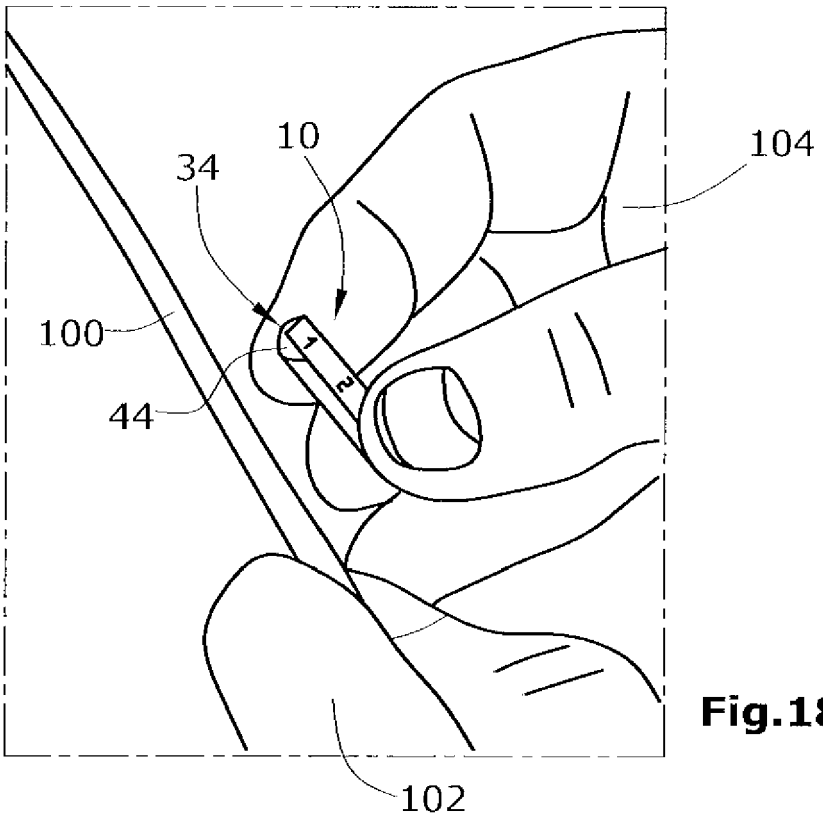

Fig.18

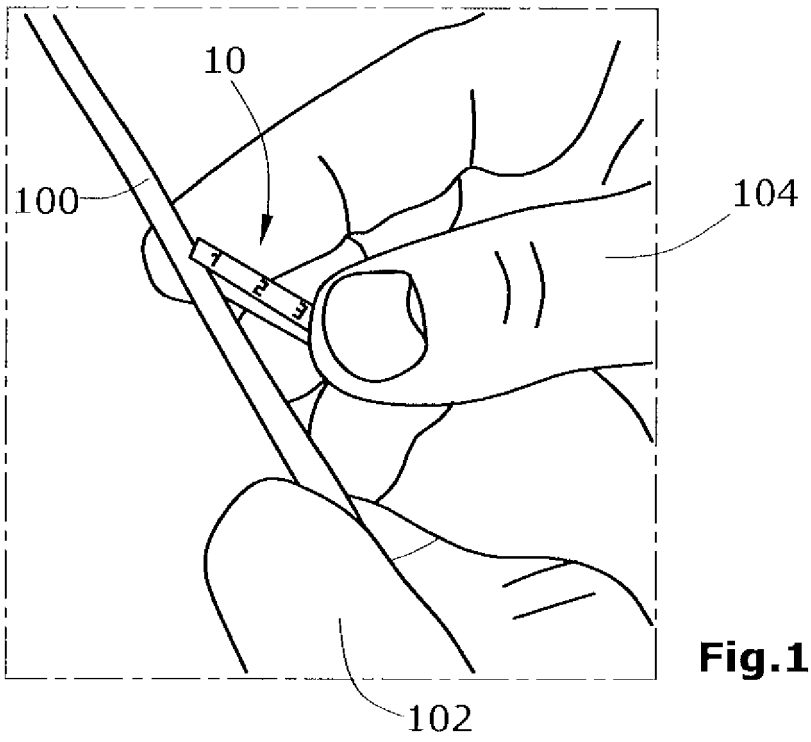

Fig.19

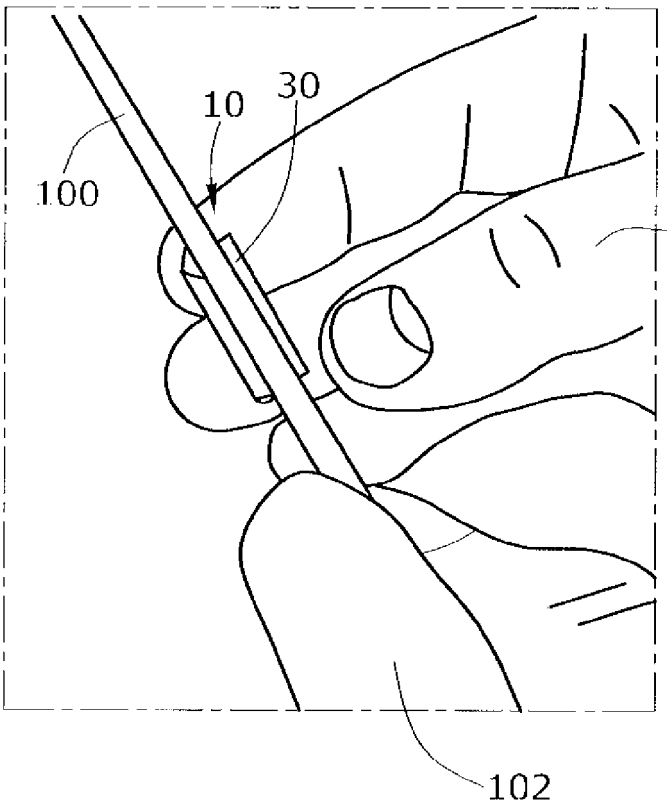

Fig.20

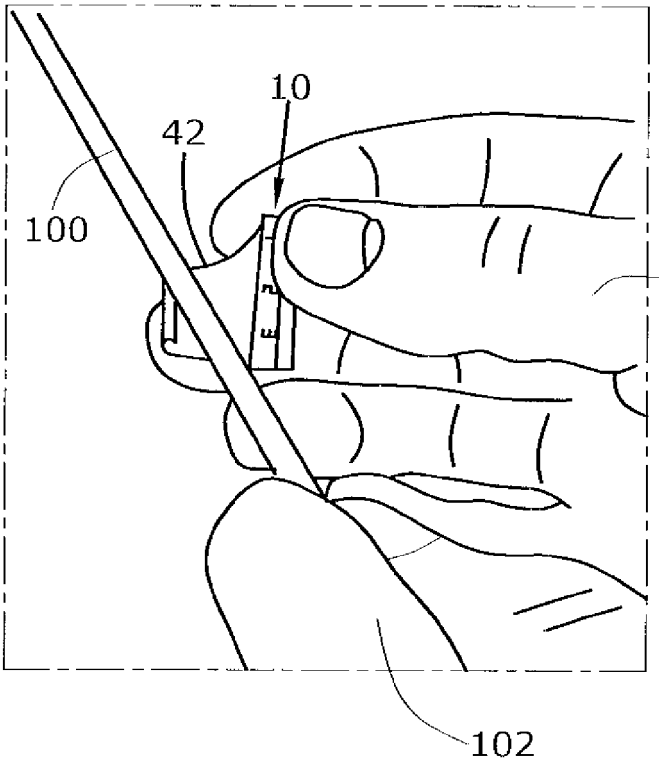

Fig.21

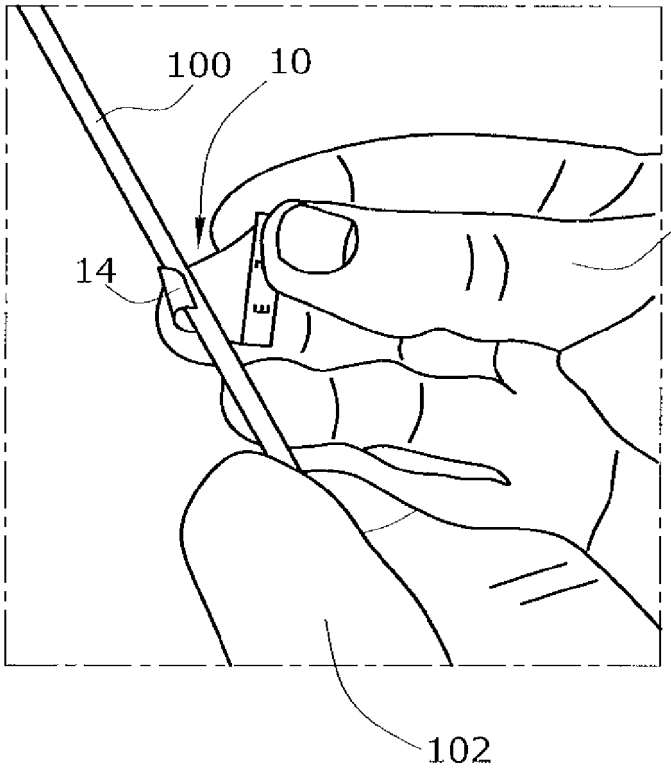

Fig.22

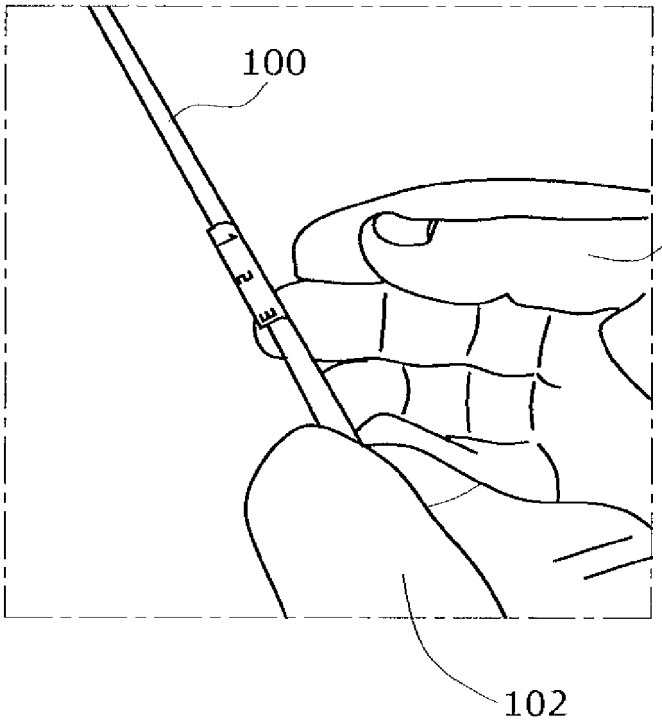

Fig.23

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 10 1422

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	US 4 782 612 A (EIDMANN ET AL) 8 November 1988 (1988-11-08) * column 1, line 40 - line 60 * * column 1, line 63 - column 2, line 6 * * column 2, line 21 - line 41 * * claims 1,2 * * figures 1-4 *	1-14	INV. G09F3/20
A	GB 2 314 547 A (* CRITCHLEY LIMITED) 7 January 1998 (1998-01-07) * page 1, line 11 - line 19 * * page 1, line 28 - page 2, line 3 * * page 3, line 8 - line 17 * * claims 1,3 * * figure 2 *	1-14	
A	DE 296 02 934 U1 (ARMAND, GUNTER, 87647 UNTERTHINGAU, DE) 18 April 1996 (1996-04-18) * page 1, line 17 - line 20 * * page 1, line 25 - line 43 * * page 2, line 30 - line 40 * * figures 1,2 *	1-14	TECHNICAL FIELDS SEARCHED (IPC) G09F
A	DE 197 38 485 A1 (PHOENIX CONTACT GMBH & CO., 32825 BLOMBERG, DE; PHOENIX CONTACT GMBH &) 10 June 1998 (1998-06-10) * column 3, line 52 - column 4, line 45 * * figures 1-5 *	1-14	
A,D	EP 0 366 873 A (GRAFOPLAST S.P.A) 9 May 1990 (1990-05-09) * column 1, line 53 - column 2, line 7 * * column 3, line 20 - line 56 * * figures 1-7 *	1-14	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 July 2006	Lechanteux, A

CATEGORY OF CITED DOCUMENTS

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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07-07-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4782612 A	08-11-1988	NONE	
GB 2314547 A	07-01-1998	NONE	
DE 29602934 U1	18-04-1996	NONE	
DE 19738485 A1	10-06-1998	DE 19747663 A1	18-06-1998
EP 0366873 A	09-05-1990	AR 247644 A1	31-01-1995
		AU 635227 B2	18-03-1993
		AU 4395289 A	10-05-1990
		CA 1335411 C	02-05-1995
		DE 68908995 D1	14-10-1993
		DE 68908995 T2	24-03-1994
		ES 2045291 T3	16-01-1994
		IT 1225720 B	22-11-1990
		PT 92181 A	31-05-1990
		US 5157853 A	27-10-1992

EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 3527633 A **[0003]**
- EP 0027026 B **[0003]**
- EP 0251605 B **[0003] [0009]**
- EP 0366873 B **[0003] [0005] [0008]**
- US 2629953 A **[0003]**
- US 2929161 A **[0003]**
- US 4782612 A **[0003]**
- US 5360584 A **[0003] [0009]**
- US 5711836 A **[0003]**
- GB 928752 A **[0004] [0009]**
- US 3847721 A **[0006]**
- US 3899807 A **[0006]**
- US 3988399 A **[0006]**