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(54) TRAFFIC SIGNAGE POST AND INSTALLATION METHOD THEREFOR

(57) The present invention refers to a pole (1) for traffic signalling presenting a general shape of cylindrical type, in particular a pole comprising a pole part (11) provided in a general shape of pole type, and a base part (12) provided in a general shape of disc type, and adapted so that can be fixed to the pavement. Said signalling pole (1) is characterized in that said pole and base parts (11, 12) are adapted so that said pole part (11) can be retained on said base part (12) by means of a fitting engagement and rotation, including retention with removable blocking.

The present invention further refers to a process of installation of such a pole (1), whereby said pole part (11) can be manually retained on said base part (12) without requiring the use of a tool.

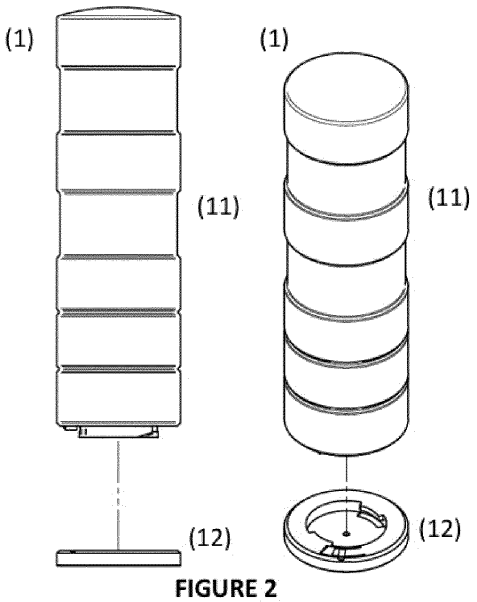

FIGURE 2

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Description

Field of the invention

[0001] The present invention refers to the field of traffic signalling devices, for example of roadway type, in particular in the form of signalling milestones of alignments of circulation ways, and similar devices.

Background of the invention

[0002] The prior art includes different solutions of traffic signalling devices of pole type in general, and of device of milestone type for signalling of alignments in circulation ways.

[0003] It is known to produce this type of devices in synthetic material, including one pole part, for example with a general shape of cylindrical type produced by means of plastic extrusion, and one base part with a general shape of disc type.

[0004] One of the problems associated with this type of devices is respective fixation, in simple and ergonomic manner to the pavement, by means of reduced cost and providing a reliable retention.

[0005] Document WO 2011/ 007902 A1 discloses a pole of the type of the present invention, presenting a pole part adapted so that can be retained in a base part adapted in turn so that be retained on the pavement. In particular, the pole part presents an engagement part adapted so that engages in an engagement part configured in corresponding manner on the base part, so that the engagement unfolds by means of a vertical movement.

[0006] Document KR 20160091558 A discloses a pole of traffic regulation presenting a pole part and a base part adapted so that the height can be adjusted.

[0007] Document CN 206070419 U seems to disclose a traffic signalling pole of the type of the present invention, presenting a pole part adapted so that can be retained on a base part adapted in turn so that can be retained to the pavement.

[0008] Document KR 20180003005 A discloses a pole of restriction of traffic way presenting a pole part and a base part adapted so that said pole part is fixed to the pavement by means of a fixation device of screw type that extends along the entire height of the pole part and through the base part.

[0009] Document DE 102011014786 A1 discloses a collection element for removable fixation of traffic plates and similar, as well as a respective retention object, whereby said collection element is configured as a synthetic material sleeve in whose interior said retention object can be fixed by fixation means of operative connection. The document is silent as to a retention of similar type to that of the present invention.

[0010] Document EP 3150263 A1 discloses an anchor of marker for installation in the snow, and that can be rotationally fitted under pressure in a hole when the hole has a relatively small diameter.

[0011] There is therefore the need of a traffic signalling pole that provides a simpler and more reliable fixation of the pole to the pavement.

[0012] Another problem associated with this type of poles is the possibility of they recovering their initial shape in case of impact thereupon, in particular after being hit by a vehicle.

General description of the invention

[0013] The objective of the present invention is to provide a roadway signalling pole, in particular of milestone type, adapted so that provides a simpler fixation, less laborious and more reliable to the pavement.

[0014] The above objective is solved according to the present invention by means of roadway signalling pole according to claim 1, whereby preferred embodiments are disclosed in the dependent claims.

[0015] In particular, said objective is solved by means of a roadway signalling pole that presents first and second engagement parts on the mutually opposing faces of the pole and base parts thereof, adapted so that provide reciprocal engagement and, preferentially, removable blocking of said pole and base parts, by means of one vertical translation movement and of one rotation movement with relation to an engagement axis.

[0016] Moreover, according to a preferred embodiment, said blocking can be removed by means of applying a force upon a respective engagement part, in particular an elastic part.

[0017] A related objective of the present invention is that of providing a more ergonomic process of installation of a roadway-signalling pole.

[0018] The objective above is solved according to the present invention by means of a process according to claim 12, whereby preferred embodiments are disclosed in the dependent claims

Description of the figures

[0019] The present invention shall be hereinafter explained in greater detail based upon preferred embodiments and the attached Figures.

[0020] The Figures show, in simplified schematic representations:

Figure 1: side and perspective top view of a preferred embodiment of the pole (1) according to the invention;

Figure 2: side and perspective top view of the embodiment of pole (1) according to the invention, at a position where the pole (11) and base parts (12) are disassembled;

Figure 3: side view of said pole part (11) of embodiment of pole (1) according to the invention,

at a first and second rotation position around respective longitudinal axis (X);

Figure 4: perspective views from the base side of the pole part (11) of said embodiment of pole (1) according to the invention;

Figure 5: detail perspective view from underneath of the inferior face of the pole part (11) of said embodiment of pole (1) according to the invention;

Figure 6: perspective view from above of the base part (12) of said embodiment of pole (1) according to the invention;

Figure 7: top view of the inferior face of the pole part (11) of said embodiment of pole (1) according to the invention;

Figure 8: top view of the base part (12) of said embodiment of pole (1) according to the invention;

Figure 9: side view of the base part (12) of said embodiment of pole (1) according to the invention;

Figure 10: cut view of the lateral cross-section, according to the cut BB indicated in figure 9, of the base part (12) of said embodiment of pole (1) according to the invention.

Description of a preferred embodiment of the invention

[0021] **Figures 1** and **2** represent an embodiment of traffic signalling pole (1), for example roadway traffic, according to the present invention.

[0022] Said traffic signalling pole (1) comprises a pole part (11) provided in a general shape of tubular type, and a base part (12) provided in a general shape of disc type, and adapted so that can be fixed to the pavement and that can retain said pole part (11), whereby said pole and base parts (11, 12) are adapted so that can mutually engage with reference to an engagement axis (X).

[0023] **Figure 1** shows said pole (1) in a condition whereby said pole (11) and base parts (12) are assembled, and Figure 2 shows said pole (1) in a condition whereby said pole (11) and base parts (12) are disassembled.

[0024] According to an inventive aspect, said pole and base parts (11, 12) present respective engagement parts in directly opposing tops and adapted so that first engagement parts (111, 121) provide engagement by means of a movement along said engagement axis (X) and second engagement parts (112, 122) provide engagement by means of a movement around said engagement axis (X).

[0025] Said engagement parts comprise first engagement parts (111, 121) and second engagement parts (112, 122) adapted so that provide engagement and removable retention by means of a movement along said engagement axis (X), preferentially in a previously defined relative position corresponding to an engagement position (I), and a movement around said engagement axis (X), preferentially by a previously defined given extension up until reaching a retention position (II).

[0026] Said engagement axis (X) can coincide at least approximately with the central longitudinal axis of said pole part (11).

[0027] Said pole (11) and base parts (12) can present a projection portion and a cavity portion in respectively directly opposing parts, adapted so that provide an engagement in reciprocal manner, whereby at least one of said pole (11) and base parts (12) presents a projecting portion, preferentially aligned with the central longitudinal axis and presenting a shape at least partially cylindrical or conic and a perimeter of circular section, and the other of said pole (11) and base parts (12) presents a cavity portion, aligned with the central longitudinal axis, oriented in the direction of said projecting portion and presenting a shape at least partially cylindrical or conic and an interior perimeter of circular or conic section, with a dimension adapted so that engages in shape with said projecting portion.

[0028] It is further preferred when each one of said pole and base parts (11, 12) presents respective first engagement parts (111, 121) provided in lateral faces of the closed alignment of a projecting portion and of a cavity portion of said pole (11) and base parts (12), respectively, said closed alignment developing around said engagement axis (X), whereby said first engagement parts (111, 121) are configured as elements projecting along a direction transversal to that of said engagement axis (X), thereby providing a shape engagement of said projecting portion of the pole part (11) on said cavity portion of the base part (12), if said pole part (11) is at a previously defined angular position relative to said base part (12), corresponding to an engagement position (I), and rotated by a given extension therefrom.

[0029] As can be better observed in **Figures 3** and **4,** and in particular in the detail of **Figure 5,** in the case of this preferred embodiment according to the invention, said pole part (11) presents a projecting portion in the inferior face thereof, configured with a shape that is at least approximately similar to the one of the remanding portion of pole part (11) and with a characteristic dimension, for example diameter, of exterior perimeter smaller than the exterior perimeter of the remanding portion of pole part (11). Said projecting portion is adapted so that can be introduced along a downwards vertical movement into a corresponding cavity portion provided in the base part (12) if disposed at a given angular position with relation thereto.

[0030] In particular, said projecting portion presents

two projecting elements (111, 121), whereby the first engagement parts (111, 121) are configured with angular extensions such that said projecting elements (111, 121) provide a longitudinal movement of introduction of the edge of said pole part (11) into the base part (12) in case vertically aligned - see also **Figures 5** and **6,** and **Figures 7** and **8** -, corresponding to said engagement position (I), and provide retention of said engagement at said retention position (II) in case they are rotated by at least a previously defined extension, preferentially a rotation movement by an extension bigger than 10° and smaller than 180°, particularly preferred bigger than 30° and smaller than 110°, around said engagement axis (X).

[0031] Moreover, said inferior face of pole part (11) presents a tooth element (112), as part of said second engagement parts (112, 122), configured as a projection that develops along a direction at least approximately parallel to said engagement axis (X) and adapted for engaging in a corresponding cavity of the other of said pole and base parts (11, 12), whereby said tooth element (112) is preferentially configured with a triangular cross-section when seen in side view and with such a cross-section when seen in top view adapted so that can be inserted in said elastic tongue disposition (122).

[0032] Moreover, the base part (11, 12) presents an elastic tongue disposition (122) associated with a cavity, as part of said second engagement parts (112, 122and configured so that can be pressed in deflexion downwards by said tooth element (112), in the rotation movement of said pole part (11) with relation to said base part (12), and in that said tooth element (112) can be inserted in the cavity so that is retained blocked in said cavity by said elastic tongue disposition (122).

[0033] It is preferred when said elastic tongue disposition (122) comprises a tongue portion that develops over an opening and is adapted so that can be deflected in elastic manner along a direction parallel to that of said engagement axis (X).

[0034] According to another preferred embodiment, and as can be observed in **Figures 9** and **10,** at least one of said pole (11) and base parts (12) presents an unblocking disposition (123) adapted so that provides the introduction from the exterior of an elongated element upon said elastic tongue disposition (122), in particular so that can be exerted pressure upon said tongue portion, so as to provide an unblocking of engagement of said second engagement parts (112, 122).

[0035] According to another inventive aspect, the process of installation of a pole (1) according to the invention, comprises carrying out a movement of said pole part (11) along a substantially vertical direction downwards, when in a previously defined alignment corresponding to an engagement position (I), so that a projecting portion of said pole part (11) is introduced into a first portion of cavity of said base part (12) and a first rotation movement of said pole part (11) around a respective longitudinal axis (x), so that provides a first engagement of said first engagement parts (111, 121).

[0036] Moreover, it is preferred when there is carried out a continuation of said first movement of rotation of said pole part (11), so that second engagement parts (112, 122) provide a blocking of engagement, preferentially including an elastic deflexion and engagement of tooth-cavity type.

[0037] It is further preferred when, in case said pole (11) and base parts (12) are in a condition of mutually retained with blocking, there can be applied a force upon at least one of said second engagement parts (112, 122), for example by means of at least one unblocking device in the interface region between said pole (11) and base parts (12) when these are retained to each other; carrying out a second rotation movement of said pole part (11) with relation to said base part (12), in the direction opposite to said first rotation movement, carrying out an upwards translation movement of said pole part (11) with relation to said base part (12).

[0038] Said pole part (11) can present a plurality of, preferentially at least six, successive sections along the height of said top part (11), whereby said sections present at least two cross-sections of different characteristic dimension, for example diameter.

[0039] Said base part (12) is advantageously provided so that can be retained in removable manner in the pavement, preferentially by means of a fixation of mechanical type, for example of screw type, or similar, through at least one orifice (214) provided in the face of the base of said base part (12).

[0040] Said pole part (11) is, preferentially, adapted so that can be produced by a method of extrusion of a plastic synthetic material

[0041] Said pole part (11) can present a cross-section of at least approximately circular shape, preferentially with a diameter comprised between 5 and 90 cm, preferentially comprised between 15 and 75 cm.

[0042] It is preferred when the exterior characteristic dimension of said pole part (11) is at least approximately similar to the exterior characteristic dimension of said base part (12).

Claims

1. **Pole (1)** for traffic signalling presenting:

   - a pole part (11) provided in a generally elongated shape of tubular type, and
   - a base part (12) provided in a generally non elongated shape, and adapted so that can be fixed to the pavement and that can be associated with said pole part (11),

   whereby said pole and base parts (11, 12) are adapted so that can mutually engage in an engagement position (I) and be retained at a retention position (II) with reference to an engagement axis (X), **characterized**

in that said pole and base parts (11, 12) present engagement parts provided in respective directly opposing parts and adapted so that provide engagement and removable retention by means of a movement along said engagement axis and a movement around said engagement axis (X), of said pole part (11) in relation to said base part (12).

2. Pole (1) according to claim 1, **characterized in that** said engagement parts comprise first engagement parts (111, 121) and second engagement parts (112, 122) adapted so that provide engagement and removable retention by means of a movement along said engagement axis (X), preferentially in a previously defined relative position corresponding to an engagement position (I), and a movement around said engagement axis (X), preferentially in a previously defined given extension until a retention position (II).

3. Pole (1) according to claim 1 or 2, **characterized in that** each one of said pole and base parts (11, 12) present respective first engagement parts (111, 121) provided in lateral faces of the closed alignment of a projecting portion and of a cavity portion of said pole (11) and base parts (12), respectively, said closed alignment developing around said engagement axis (X), whereby said first engagement parts (111, 121) are configured as elements projecting along a direction transversal to that of said engagement axis (X), thereby providing a shape engagement of said projecting portion of the pole part (11) on said cavity portion of the base part (12), if said pole part (11) is at a previously defined angular position relative to said base part (12), corresponding to an engagement position (I), and rotated by a given extension therefrom.

4. Pole (1) according to any of claims 1 to 3, **characterized in that** each one of said pole and base parts (11, 12) presents at least one, preferentially two projecting elements (111, 121), preferentially configured and distributed in symmetric manner along a common closed alignment, for example of circular shape, that develops around in symmetric manner and centred with relation to said engagement axis (X), whereby said first engagement parts (111, 121) are configured with angular extensions so that said projection elements (111, 121) provided a longitudinal movement of introduction of the edge of said pole part (11) into said base part (12) in case vertically aligned, corresponding to said engagement position (I), and provide retention of said engagement at said retention position (II) in case they are rotated by at least a previously defined extension, preferentially by a rotation movement in an extension bigger than 10° and smaller than 180°, particularly preferred bigger than 30° and smaller than 110°, around said engagement axis (X).

5. Pole (1) according to any one of previous claims 1 to 4, **characterized in that** each one of said pole and base parts (11, 12) presents second engagement parts (112, 122) provided in directly opposing base and top surface of said pole (11) and base parts (12), respectively, preferentially in an exterior region with relation to said first engagement parts (111, 121), and adapted so that can mutually engage and provide blocking of retention, for example by means of a connection of tooth-cavity type, including against at least one of: a rotation movement and a spreading translation movement between said pole (11) and base parts (12).

6. Pole (1) according to any one of previous claims 1 to 5, **characterized in that** at least one of said pole and base parts (11, 12) presents a tooth element (112), as part of said second engagement parts (112, 122), configured as a projection that develops along a direction at least approximately parallel to said engagement axis (X) and adapted for engaging in a corresponding cavity of the other of said pole and base parts (11, 12), whereby said tooth element (112) is preferentially configured with a triangular cross-section when seen in side view and with a cross-section when seen in top view adapted so that can be inserted in said elastic tongue disposition (122) .

7. Pole (1) according to any one of previous claims 1 to 6, **characterized in that** at least one of said pole and base parts (11, 12) presents an elastic tongue disposition (122) associated with a cavity, as part of said second engagement parts (112, 122and configured so that can be pressed in deflexion downwards by said tooth element (112), in the rotation movement of said pole part (11) with relation to said base part (12), and in that said tooth element (112) can be inserted in the cavity so that is retained blocked in said cavity by said elastic tongue disposition (122).

8. Pole (1) according to claim 7, **characterized in that** said elastic tongue disposition (122) comprises a tongue portion that develops over an opening and is adapted so that can be deflected in elastic manner along a direction parallel to that of said engagement axis (X) .

9. Pole (1) according to any one of previous claims 1 a 8, **characterized in that** at least one of said pole (11) and base parts (12) presents an unblocking disposition (123) adapted so that provides the introduction from the exterior of an elongated element upon said elastic tongue

disposition (122), in particular so that can be exerted pressure upon said tongue portion, so as to provide an unblocking of engagement of said second engagement parts (112, 122).

10. Pole (1) according to any one of previous claims, **characterized**
in that said pole part (11) presents a form aspect ratio, in particular a relation of total height of said pole part (11) in relation to the characteristic dimension of cross-section thereof, for example diameter, of at most twelve, preferentially of at most ten, and
in that said base part (12) presents a form aspect ratio, in particular a relation of total height of said base part (12) in relation to the characteristic dimension of cross-section thereof, for example diameter, of at least 0,1, preferentially at least 0,2.

11. Pole (1) according to any one of previous claims, **characterized**
in that at least said pole part (11), preferentially both of said pole and base parts (11, 12) are produced in a synthetic plastic material, preferentially in ethylene vinyl acetate (EVA), or in a synthetic material presenting a similar memory shape factor, provided so that can recover its initial position and form in case of an impact force thereupon, and in case said impact force is removed.

12. **Process** of installation of a traffic signalling pole, in particular of a traffic signalling pole (1) according to any one of claims 1 to 11, comprising the following steps:

- providing a traffic signalling pole (1) presenting a pole part (11) and a base part (12);
- retaining said base part (12) on the pavement;
- moving said pole part (11) along a substantially vertical direction downwards, when in a previously alignment corresponding to an engagement position (I), so that a projecting portion of said pole part (11) is inserted into a first cavity portion of said base part (12);
- carrying out a first rotation movement of said pole part (11) around respective longitudinal axis (x), so that provides a first engagement of said first engagement parts (111, 121);
- further continuing the first rotation movement of said pole part (11), so that second engagement parts (112, 122) provide a blocking engagement, preferentially including an elastic deflexion and engagement of tooth-cavity type,

so that results the retention of said pole part (11) on said base part (12).

13. Process according to claim 12, **characterized in that** further includes the step:

- applying a force upon at least one of said second engagement parts (112, 122), for example by means of at least one unblocking device in the interface region between said pole (11) and base parts (12) when these are retained with each other;
- carrying out a second movement of rotation of said pole part (11) with relation to said base part (12), in the direction opposite to said first rotation movement,
- carrying out a translation movement upwards of said pole part (11) with relation to said base part (12),

so that said pole part (11) is removed from said base part (12).

14. Process according to claim 12 or 13, **characterized In that** all the movements and application of force associated with the retention of said pole part (11) on the base part (12) are carried out manually, without the use of any tool or auxiliary means.

15. Process according to claims 12 to 14, **characterized in that** further includes the step of fixing said base part (12) to the pavement, including mechanical fixation means of removable type.

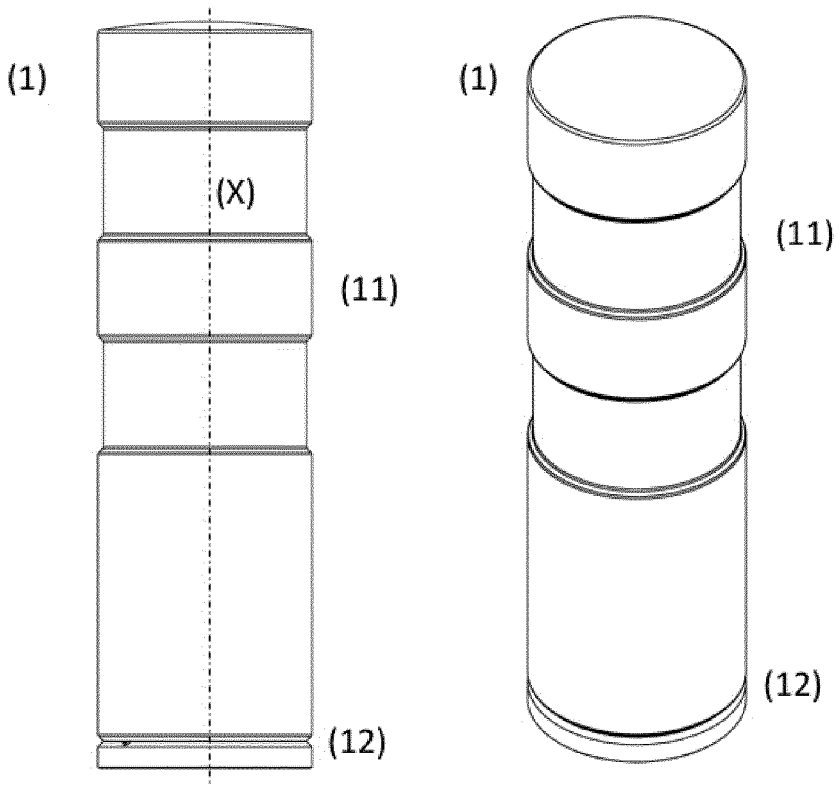

FIGURE 1

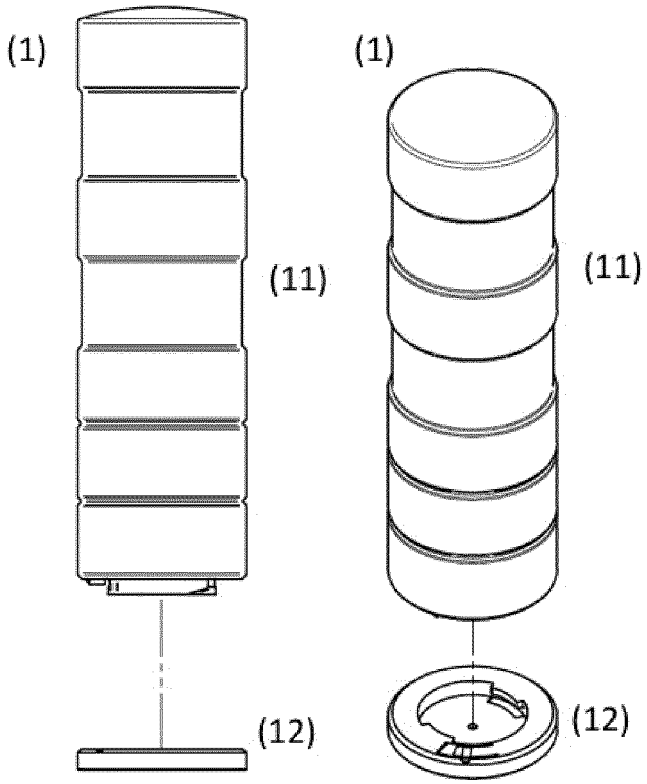

FIGURE 2

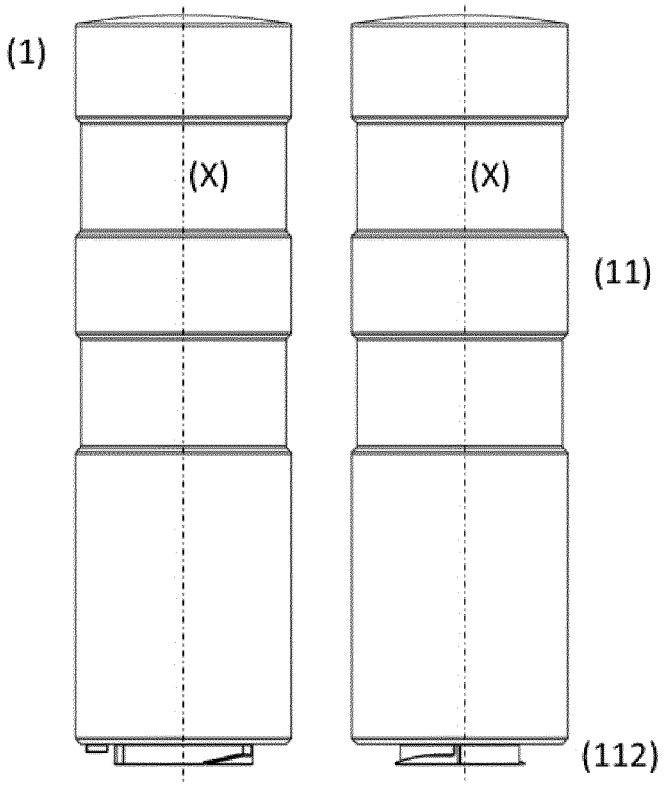

FIGURE 3

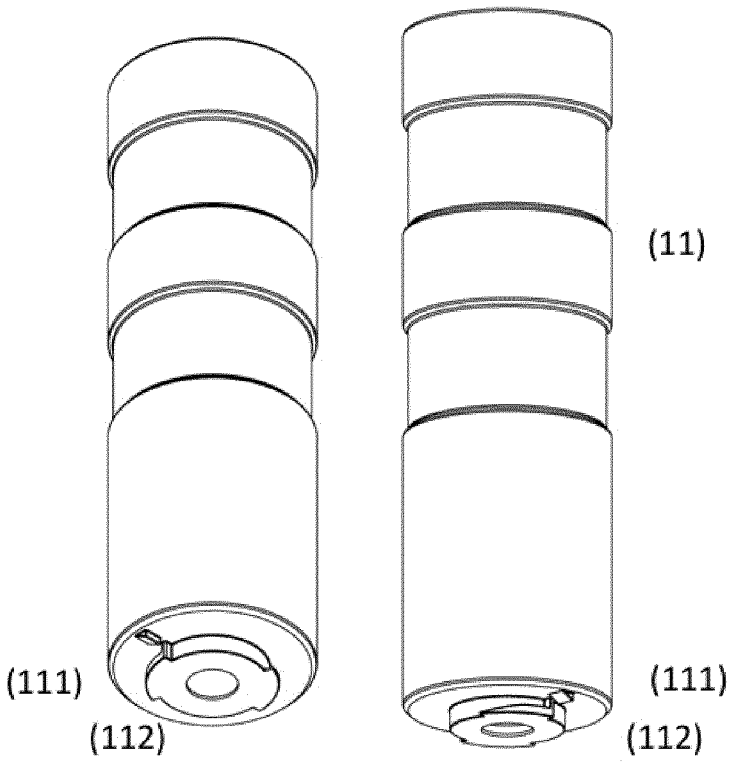

FIGURE 4

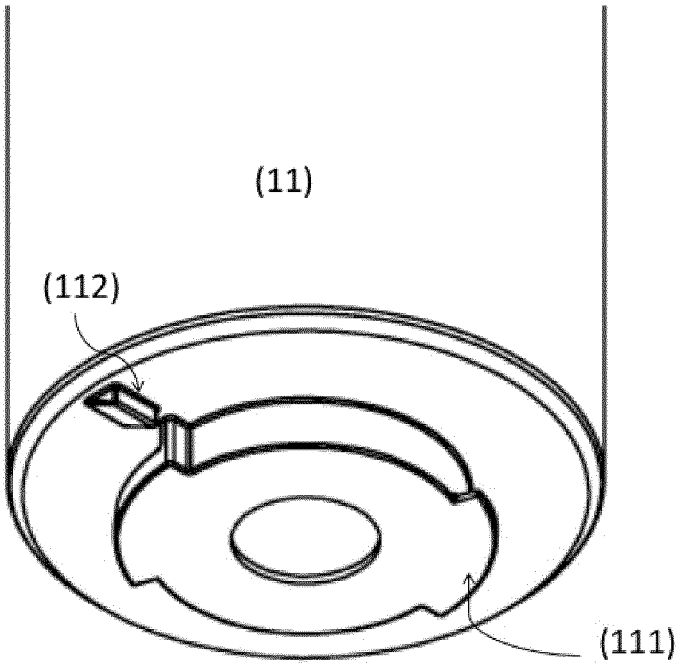

FIGURE 5

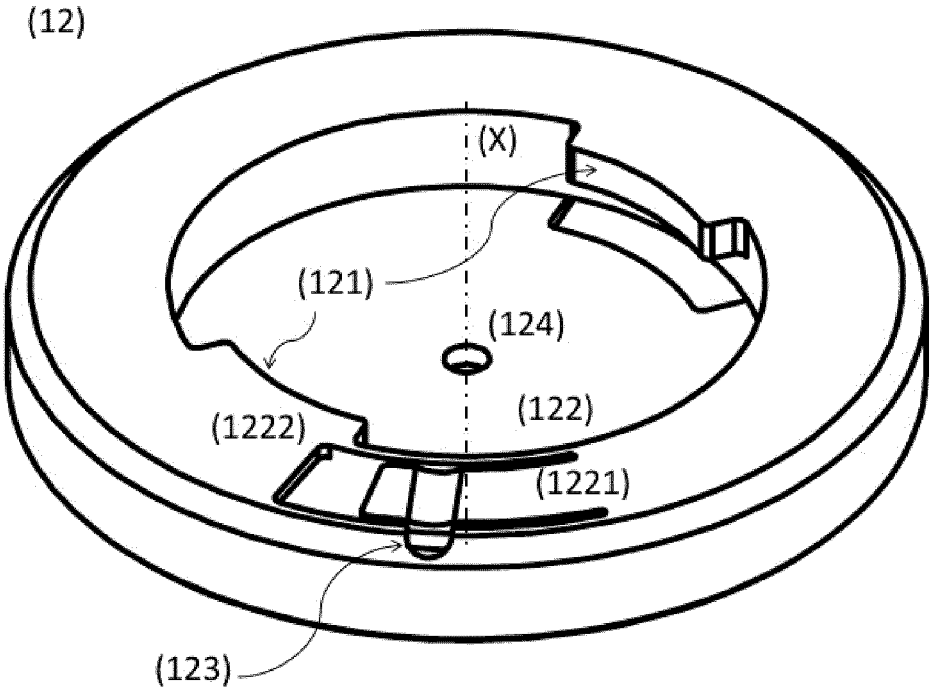

FIGURE 6

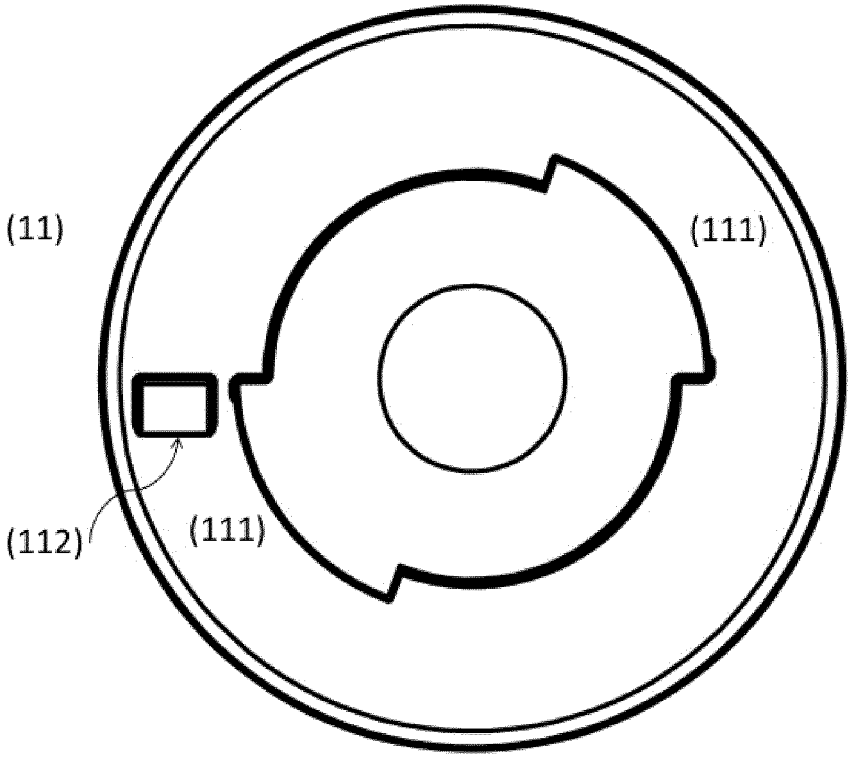

FIGURE 7

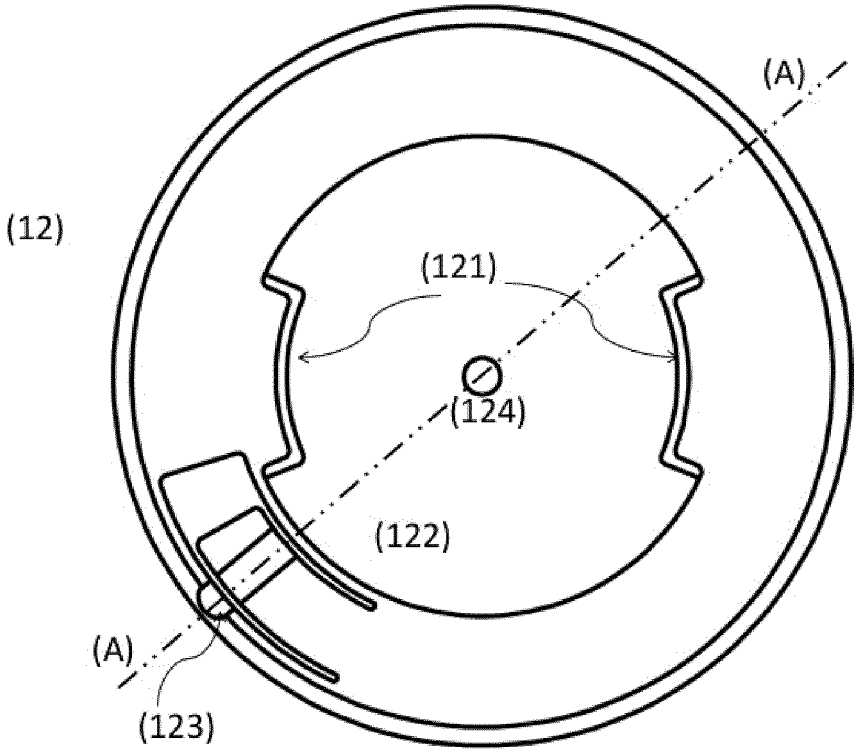

FIGURE 8

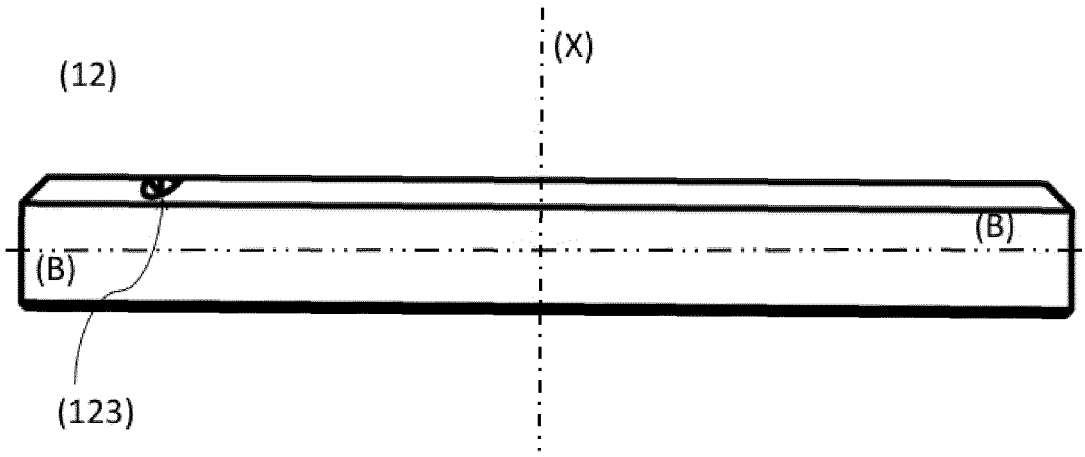

FIGURE 9

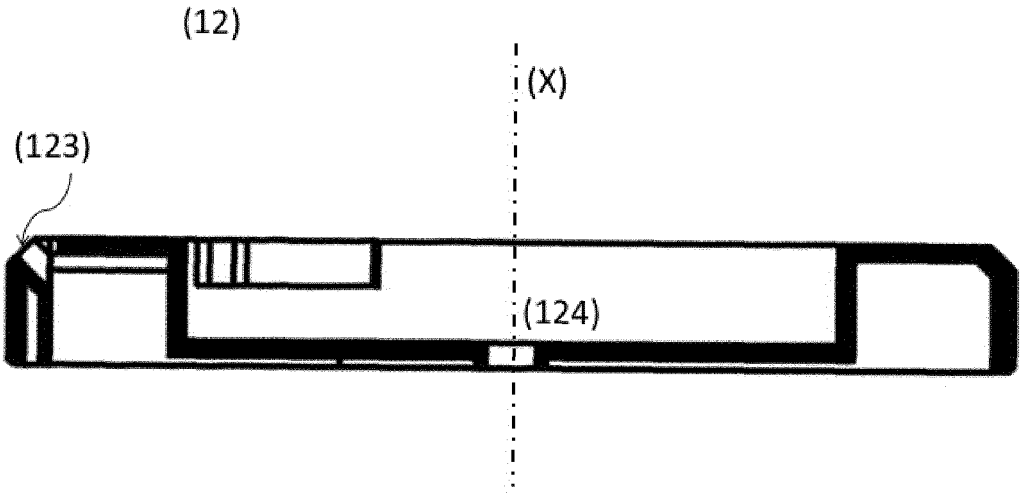

FIGURE 10

RELATÓRIO DE PESQUISA INTERNACIONAL

Depósito internacional Nº
PCT/PT2019/000005

A. CLASSIFICAÇÃO DO OBJETO

INV. E01F9/627 E01F9/677

De acordo com a Classificação Internacional de Patentes (IPC) ou conforme a classificação nacional e IPC

B. DOMINIOS ABRANGIDOS PELA PESQUISA

Documentação mínima pesquisada (sistema de classificação seguido pelo símbolo da classificação)

E01F

Documentação adicional pesquisada, além da mínima, na medida em que tais documentos estão incluídos nos domínios pesquisados

Base de dados eletrônica consultada durante a pesquisa internacional (nome da base de dados e, se necessário, termos usados na pesquisa)

EPO-Internal, WPI Data

C. DOCUMENTOS CONSIDERADOS RELEVANTES

Categoria*	Documentos citados, com indicação de partes relevantes, se apropriado	Relevante para as reivindicações Nº
X	EP 1 860 242 A2 (CELAYA EMPARANZA GALDOS INT SA [ES]) 28 de novembro de 2007 (28.11.2007) todo o documento ----	1-5, 12-15
X A	US 2008/209784 A1 (BRODIE IAN CHARLES [AU]) 04 de setembro de 2008 (04.09.2008) paragraphs [0023], [0065], [0074] - [0076]; figures 3,9A-10E ----	1-5, 12-15 6-11
X	FR 2 720 417 A1 (SODIREL [FR]) 1 de dezembro de 1995 (01.12.1995) página 3, linha 15 - página 5, linha 8; figuras 1-4 ----	1-5, 12-15
X	KR 2013 0071553 A (KANG HYUNG KYU [KR]; CHOI YOUNG SIN [KR]; PARK KYUNG DUCK [KR]) 1 de julho de 2013 (01.07.2013) figuras 2-5 ----	1-5, 12-15

☐ Documentos adicionais estão listados na continuação do Quadro C ☒ Ver o anexo de família da patentes

* Categorias especiais dos documentos citados:

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Data da conclusão da pesquisa internacional	Data do envio do relatório de pesquisa internacional:
05 de novembro de 2019 (05.11.2019)	13 de novembro 2019 (13.11.2019)

Nome e endereço da ISA/	Funcionário autorizado
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