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(54) **SUPPORT SYSTEM FOR AWNING**

(57) A support system (1) comprises a support element (2) configured to be connected to an anchoring surface (3), a pole (4), a connecting element (5) rotatably engaged at a bottom end of the pole (4), wherein the connecting element (5) is configured to connect, in a removable way, the pole (4) to the support element (2), wherein the support system (1) comprises a retaining element (16) configured to connect the pole (4) and the connecting element (5) in such a way that the pole (4) is constrained to the connecting element (5) along a longitudinal axis (9) and is selectively rotatable with respect to the connecting element (5) about the longitudinal axis (9).

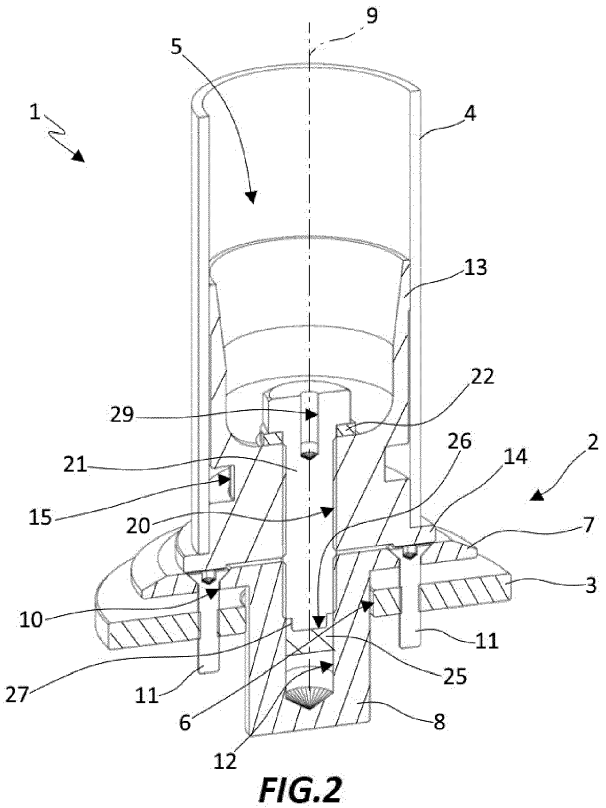

FIG.2

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Description

[0001] The present invention relates to a support system configured to support a pole to which an awning can be connected.

[0002] In the following description specific reference will be made to a support system configured to be used in a boat, for example, for the installation, along the deck, of an awning, although it is understood that it can also be used in alternative shipboard installations or in other sectors such as construction, gardens, terraces, or other applications.

[0003] The use of an awning to provide shelter from the sun on a boat has been known for some time. The awning is supported by several poles that can be connected to respective fixing points installed along the deck. Each of the poles has a head end bearing at least one rope for connecting to a respective portion of the awning and a bottom portion that can be housed in a support attached to the deck.

[0004] The support is made as a cup element comprising a hollow cylindrical body, which delimits the housing seat for the bottom end of the pole, and a connection flange placed at the top portion of the cup element.

[0005] In practice, single holes are made along the deck wherein respective supports bound to the deck by screws or the like which engage respective through openings made along the connection flange are housed.

[0006] The individual poles can be inserted or removed from their respective supports to allow the awning to be installed or removed according to specific use requirements.

[0007] A similar support system for an awning is of practical use since the pole, after installing the support, can be installed by a user during navigation or mooring in the port, without requiring the intervention of specialized personnel.

[0008] A drawback that afflicts such a support system for an awning concerns its installation. In fact, in order to ensure stable support of the pole, the individual support elements have a high depth, understood as the distance between the bottom portion of the single support element and the flange. In practice, the individual support elements, once installed along the deck, extend below it, causing not to use the space below, or sometimes interfering with the underlying furnishings.

[0009] Furthermore, when used in construction for installation on floors, terraces or gardens, the size of the hole and the depth of the support strongly affect the possibilities of using a support system of the type described above.

[0010] Furthermore, each cylindrical seat delimited by a respective support element has an internal diameter at least greater than the external diameter of the support pole. For this reason it is necessary to make large holes.

[0011] Furthermore, since the cup has a large internal diameter, it accommodates a large quantity of water inside, especially when the pole is not in position; it is therefore necessary to provide a drainage system configured to remove the water from the pole housing.

[0012] In the sector there is a need to have a support system for poles which is more practical to install on board of a boat and which is not affected by the drawbacks of the traditional solutions described above.

[0013] The object of the present invention is to allow in a simple, efficient and economical way to produce a support system configured to provide a removable support for supporting a pole to which a boat awning can be connected.

[0014] Another object of the present invention is to provide a support system which is of practical use and easy to be installed.

[0015] A further object of the present invention is to provide a support system configured to support a pole intended to support an awning on board of a boat, wherein this support system requires minimal modifications to the boat to allow its installation, thus resulting implementable on various types of boats. Similar considerations apply to a possible use of the support system according to the invention, for installations in the building sector.

[0016] Yet another object is to provide a support system configured to support a pole designed to support awning on board a boat, with a low maintenance.

[0017] The specific object of the invention is a support system configured to be coupled to an anchoring surface, wherein the support system comprises a support element configured to be connected to the anchoring surface, a pole, a connecting element engaged at a hollow bottom end of the pole, a retaining element that removably connects the pole and the connecting element to each other, in such a way that the pole is constrained to the connecting element along a longitudinal axis and is selectively rotatable with respect to the connecting element about the longitudinal axis, wherein the connecting element comprises an engaging portion which removably engages the hollow bottom end of the pole, wherein the engaging portion defines an annular seat at least partially engaged in a removable way from the retaining element when the pole is connected to the connecting element, wherein the connecting element defines a threaded central seat extending through the engaging portion, wherein the engaging portion terminates in a flanged portion through which the connecting member is configured to connect, in a removable manner, the pole with the support element, the threaded central seat being engaged by a threaded pivot which extends for at least a portion outside the connection element, through the flanged portion.

[0018] According to another aspect of the invention, the retaining element can comprise a connecting screw which removably engages a through opening made at the bottom hollow end of the pole and comprises a bushing configured to removably engage the seat ring finger and to be removably engaged, in turn, by the connecting screw.

[0019] According to a further aspect of the invention, the bushing can be interposed between the pole and the annular seat.

[0020] According to an additional aspect of the invention, the support system can comprise a locking element positioned along the annular seat and configured to define a selective abutment for the retaining element along the annular seat and to limit the rotation of the pole relative to the connecting element around the longitudinal axis.

[0021] According to another aspect of the invention, the locking element can have an engagement portion which engages a seat delimited along the annular seat and a head portion which extends inside the annular seat and remains within the overall plan dimensions of the annular seat so as not to interfere with the pole.

[0022] According to a further aspect of the invention, the locking element can limit the relative rotation between the pole and the connecting element to an angle equal to or less than 350°.

[0023] According to an additional aspect of the invention, the support system when said pole is connected to the support element, the threaded pivot can engage at least a portion of a threaded seat delimited along the support element.

[0024] According to another aspect of the invention, the support system can comprise a socket screw engaged along the threaded seat to occlude an access opening inside the threaded seat, wherein the socket screw has a head portion delimiting one recess configured to be selectively engaged, by form coupling, by a projecting free end of the threaded pivot.

[0025] The advantages offered by the support system 1 according to the invention are evident.

[0026] The support system 1 in fact has a support element configured to be constrained to an anchoring surface and configured to provide a connection and support point for a pole to which the awning is to be connected.

[0027] The pole in turn includes a connecting element configured to removably connect the pole with the support element bound to the anchoring surface, simply by screwing or unscrewing the pole relative to the support element.

[0028] Furthermore, the support system 1 is configured to allow a selective rotation, with a rotation angle of just under 360 °, of the pole itself with respect to the support element, to allow the pole to align the top to which the awning to allow it to be properly tensioned.

[0029] The present invention will now be described, by way of non-limiting example, according to its preferred embodiments, with particular reference to the Figures of the attached drawings, wherein:

Figure 1 shows a perspective view of a support system according to the invention;

Figure 2 shows a section view along the section plane II of the support system of Figure 1;

Figure 3 shows a section view of the support system of Figure 1 along a section plane III, perpendicular to the section plane II;

Figure 4 shows a sectional view of the support system of Figure 3, along the section plane IV-IV;

Figure 5 shows a perspective view of some components of the support system according to the invention.

[0030] With reference to Figure 1, a preferred embodiment of a support system according to the invention can be observed, configured to provide at least one connection point to which an awning as connected, wholly indicated with 1.

[0031] The support system 1 comprises a support element 2 configured to be connected to an anchoring surface 3, a tubular element or pole 4 and a connecting element 5 configured to connect, in a removable way, the pole 4 to the support element 2.

[0032] The connecting element 5 engages a hollow bottom end of the pole 4 to which it is connected in a stable manner according to a way that will be described below.

[0033] The pole 4 is configured to rotate relative to the connecting element 5 as better described below.

[0034] The pole 4 is hollow while meaning that an alternative embodiment of the support system 1 according to the invention comprises a pole 4 at least partially hollow, provided with at least one hollow bottom end.

[0035] According to a preferred embodiment, the anchoring surface 3 is the deck of a boat, although it is understood that alternative embodiments of the support system 1 are possible which can be connected to an alternative anchoring surface with respect to the one indicated above or the use in other sectors such as construction, gardens, terraces, or other applications.

[0036] In this regard, a preferred embodiment of the support system 1 comprises a pole 4 made of carbon fiber and a connecting element 5 made of steel or of a metal alloy resistant to saline corrosion.

[0037] In the attached Figures 1 and 2 the anchoring surface 3 is schematically illustrated as a circular element, purely by way of example, to facilitate understanding of the connection of the support system 1 to it.

[0038] The support element 2 has a mushroom or substantially mushroom shape and is configured to be partially housed inside a through opening 6 made through the anchoring surface 3.

[0039] In practice, the position of the through opening 6 defines the installation point of the support system 1 along the anchoring surface 3.

[0040] The support element 2 has a flange 7 from which a body 8 protrudes. More precisely, the body 8 extends along a longitudinal axis 9 (see Figures 2 and 5). Evidently, the body 8 has a smaller footprint area in plan than that of the flange 7.

[0041] The flange 7 acts as an abutment and connection portion for the support element 2 relative to the anchoring surface 3.

[0042] In practice, the flange 7 defines a stop for the support element 2, preventing it from falling completely inside the through opening 6, holding it in position and allowing to distribute the stresses affecting the supporting element 2 along a wider area of the anchoring surface 3.

[0043] The body 8 is configured to engage the through opening 6 delimited along the anchoring surface 3.

[0044] According to a preferred embodiment, the body 8 has a cylindrical configuration (see Figure 5) and the through opening 6 is circular.

[0045] It is understood that the conformation of the through opening 6 is a function of the conformation of the body 8. Alternative embodiments can provide a prismatic body 8 and, consequently, the through opening 6 is square shaped.

[0046] The flange 7 has at least one hole 10 configured to be engaged by a screw 11, to constrain the support element 2 to the anchoring surface 3.

[0047] With reference to the embodiment illustrated in Figure 5, the flange 7 has four holes 10 arranged equidistant from each other according to a circular symmetry with respect to the longitudinal axis 9, although it is understood that alternative embodiments are possible comprising a different number of holes 10 and respective screws 11, for example three or five, depending on the characteristics of the connection to be made.

[0048] The support element 2 has a threaded seat 12, internally threaded.

[0049] The threaded seat 12 is blind and extends centrally along the body 8, parallel to the longitudinal axis 9.

[0050] The threaded seat 12 is configured to be selectively engaged by a threaded element which protrudes from a bottom end of the connecting element 5, to allow the connection or removal of the pole 4 relative to the support element 2, screwing or unscrewing the pole 4 itself.

[0051] The connecting element 5 includes an engagement portion 13, configured to engage a hollow bottom end of the pole 4, and a flanged portion 14 configured to abut against the hollow bottom end of the pole 4.

[0052] The engagement portion 13 and the flanged portion 14 are constrained to each other to define a single body.

[0053] The engagement portion 13 is cylindrical and extends along an engagement direction which, in an assembly configuration, i.e. with the pole 4 connected to the support element 2, corresponds to the longitudinal axis 9 (see Figures 2 and 3).

[0054] The flanged portion 14 defines a stop for the hollow bottom end of the pole 4 in order to establish an end position for the engagement portion 13 along the pole 4.

[0055] In practice, the flanged portion 14 prevents the connecting element 5 from being accidentally inserted completely inside the pole 4 itself.

[0056] The flanged portion 14 also has a flat or at least partially flat abutment surface opposite the side from which the engagement portion 13 extends.

[0057] The abutment surface is configured to abut against the flange 7 of the support element 2, with the connecting element 5 connected to the latter (see for example Figure 3), ensuring a firm and secure bond between these components.

[0058] The engagement portion 13 has an annular seat 15 (see Figures 2-4) accessible laterally, configured to allow the mechanical connection between the connecting element 5 and the pole 4, as better described below.

[0059] The pole 4 is bound to the connecting element 5 by means of a retaining element 16.

[0060] More in detail, the retaining element 16 engages the pole 4 and is at least partially in engagement along the annular seat 15. The retaining element 16, when is in at least partial engagement along the annular seat 15, mutually blocks the connecting element 5 and the pole 4 along an axial direction parallel to the engagement axis 9.

[0061] In practice, the retaining element 16 prevents the pole 4 from slipping off the connecting element 5.

[0062] The retaining element 16 synergistically with the annular seat 15 define a rotating connection, configured to guide the relative rotation between the pole 4 and the engagement element 13 around the longitudinal axis 9, as better described below.

[0063] The retaining element 16 includes a connecting screw 17 which engages an opening 18 made through the bottom end of the pole 4 and a bushing 19 configured to engage the annular seat 15 and to be engaged by the connecting screw 17.

[0064] Optionally, the pole 4 comprises a bush not shown in the attached Figures, which engages the opening 18 and is configured to be engaged in turn by the connection screw 17. In practice, the bush prevents direct contact between the connection screw 17 and pole 4 avoiding a damage to the latter.

[0065] The annular seat 15, when the engagement portion 13 is inserted in the hollow bottom end of the pole 4, faces an internal surface of said pole 4 (see for example Figure 2).

[0066] In practice, with the engagement portion 13 inserted in the hollow bottom end of the pole 4, the bushing 19 is positioned along the annular seat 15, interposed between the pole 4 and the engagement element 13 itself.

[0067] The bushing 19 is configured to slide or roll along the annular seat 15 being configured, for example, as a bushing or a bearing or a nut.

[0068] The engagement portion 13 acts as a collar to guide the rotation of the pole 4 relative to the connecting element 5 around the longitudinal axis 9.

[0069] The engagement portion 13 is partially hollow (see Figures 2 and 3) to limit the overall weight of the connecting element 5. The shape of the engagement portion 13 is in any case such as to ensure a stable connection capable of distributing stresses which act at the bottom portion of the pole 4, a portion which in use is more subject to stresses.

[0070] The connecting element 5 defines a central threaded seat 20 which passes through the entire engagement portion 13 and the flanged portion 14.

[0071] The central threaded seat 20 extends along a direction which, with the support system 1 in the assembled configuration, coincides with the longitudinal axis 9.

[0072] As mentioned, the connecting element 5 includes a threaded element that protrudes from the bottom portion of the connecting element 5 itself.

[0073] More in detail, the connecting element 5 comprises a threaded pivot 21 configured to engage the threaded central seat 20 so as to extend for at least a portion outside the connecting element 5 itself, through the flanged portion 14 (see Figure 3).

[0074] The portion of the threaded pivot 21 that extends outside the connecting element 5 is configured to engage at least a portion of the connection seat 12 of the support element 2.

[0075] A washer 22 is interposed between the threaded pivot 21 and the engagement portion 13, to ensure a stable connection of the threaded pivot 21 along the central threaded seat 20. For example, the washer 22 is of the security type. In practice, the threaded pivot 21 is bound to the connecting element 5.

[0076] It is understood that according to an alternative embodiment, not shown in the attached Figures, instead of a threaded pivot 21, the connecting element 5 comprises a threaded rod which engages the central threaded seat 21 and extends for at least a portion of the of the connecting element 5, through the flanged portion. The threaded bar is bound to the connecting element 5 through a permanent constraint, such as welding.

[0077] The support system 1 comprises a locking element 23 positioned along the annular seat 15 configured to define a selective abutment for the retaining element 16 along the annular seat 15 itself, so as to limit the rotation of the pole 4 relative to the connecting element 5 around the longitudinal axis 9.

[0078] The locking element 23 is configured as a screw or a pivot or a pin or a similar element provided along the annular seat 15 (see the sectional views illustrated in Figures 3 and 4).

[0079] More in detail, the locking element 23 has a portion which engages a seat 24 delimited along the bottom of the annular seat 15 and a head portion which extends inside the annular seat 15 and remains within the overall plan dimensions of the annular seat 15 itself, so as not to interfere with the pole 4.

[0080] The locking element 23 is configured to selectively limit the movement of the retaining element 16 and, consequently, the rotation of the pole 4 relative to the connecting element 5, selectively binding them to each other. By constraining the relative rotation between the pole 4 and the connecting element 5, it is possible to connect or remove the pole 4 to the support element 2, by screwing or unscrewing the pole 4 and then the threaded pivot 21 relative to the threaded seat 12.

[0081] Preferably, the locking element 23 is configured to allow the rotation of the pole 4 relative to the connecting element 5 by almost 360° or in any case less than 360° and around this value.

[0082] The support system 1 comprises a socket screw or dowel 25 engaged along said threaded seat 12 and configured to occlude an access opening inside it, to prevent the entry of dirt or foreign bodies which could compromise or avoid the connection of the threaded pivot 21 into the threaded seat 12 itself.

[0083] The socket screw 25 has a head portion delimiting a recess 26 configured to be selectively engaged, by means of a shape coupling, by a free end 27 of the threaded pivot 21 (see Figures 2 and 3).

[0084] In practice, after the engagement between the free end 27 and the recess 26, the rotation of the threaded pivot 21 around the longitudinal axis 9 causes the rotation of the socket screw 25 and therefore the advancement thereof inside the seat connection 12, along the longitudinal axis 9.

[0085] The direction of advancement of the socket screw 26 along the connection seat 12 depends on the direction wherein the pole 4 and, therefore, the threaded pivot 21 are rotated.

[0086] Below is a brief description of the assembly of the support system 1 to an anchoring surface 3.

[0087] A support element 2 is installed at a through opening 6 made along an anchoring surface 3, by inserting the body 8 inside this through opening 6 and binding the flange 7 by means of the screws 11.

[0088] The support element 2 has the threaded seat 12 occluded by the socket screw 25.

[0089] A pole 4 having the connecting element 5 at one end of it, bound to the pole 4 itself, is provided and the free end 27 of the threaded pivot 21, which protrudes from the bottom of the connecting element 5, is brought in engagement in the recess 26, connecting them reciprocally.

[0090] Then, keeping the pole 4 aligned with the longitudinal axis 9, the pole 4 itself is rotated around the longitudinal axis 9 keeping the free end 27 engaged in the recess 26.

[0091] Following the rotation of the pole 4 around the longitudinal axis 9, in screwing, the relative rotation is determined between the pole 4 itself and the connecting element 5, causing the sliding of the bushing 19 inside the annular seat 15.

[0092] The bushing 19 advances in its rotation around the longitudinal axis 9 until it abuts against the locking element 23.

[0093] The further rotation of the pole 4, screwing it, causes the rotation of the connecting element 5, due to the contact between the bushing 19 and the locking element 23, causing the rotation of the threaded pivot 21 around the longitudinal axis 9. The threaded pivot 21 driven in rotation around the longitudinal axis 9 determines the rotation of the socket screw 25, screwing it and making it advancing along the threaded seat 12.

[0094] The screwing of the pole 4 is continued so that

the threaded pivot 21 engages, by screwing, the threaded seat 12 of the support element 2, until the abutment surface of the flanged portion 14 is firmly abut against the flange 7 of the support element 2.

[0095] When tightening between the connecting element 5 and the support element 2 is completed, the pole 4 is free to rotate around the longitudinal axis 9, in the opposite direction with respect to the stop position previously assumed during the screwing phase, wherein the bushing 19 was in abutment against the locking element 23, to allow the pole 4 to align itself with the direction along which the stresses transmitted by the awning act.

[0096] To disconnect the pole from the support element 2, proceed in reverse order to what was previously described, unscrewing the pole 4.

[0097] The pole 4 is configured for the connection with at least one top of the awning in a manner within the reach of the person skilled in the art. Furthermore, the pole 4 is configured to be operationally connected to a hoist configured to regulate the tension of the rope and, consequently, the tension of an awning connected to it.

[0098] It should be noted that the connection of the rope to the pole 4 or the presence of a hoist or further elements for connecting and adjusting the tension of the rope have not been intentionally illustrated in the attached Figures, as they do not form a specific object of the present invention and, therefore, they will not be described further.

[0099] The connecting element 5, according to a preferred embodiment, comprises an eyebolt 28 engaged in a blind seat 29 made at a head portion of the threaded pivot 21 (see Figure 3).

[0100] It should be noted that in the attached Figure 2 the eyebolt 28 has been intentionally omitted to facilitate a better understanding of the internal structure of the support device 1.

[0101] The eyebolt 28 is housed inside the pole 4 and provides an internal connection point to which at least one rope or an element for adjusting the tension of a rope can be operatively connected to which a portion of the awning can be operatively connected in a manner within the reach of the skilled person in the art.

[0102] The object of the present invention is a support kit for an awning comprising a plurality of support systems 1 previously described. The number of support systems 1 depends on the size and shape of the awning.

[0103] The person skilled in the art will easily understand how a support system 1 according to the invention is able to achieve the intended purposes.

[0104] The support system 1, in fact, requires the realization of a hole with limited dimensions through an anchoring surface 3 for its installation and determines an extremely limited space below it.

[0105] The support element 2, which acts as a constraint to which the pole 4 is connected, has a limited extension along the longitudinal axis 9, extremely reduced compared to that of the prior art solutions.

[0106] In fact, in the support system 1, the pole 4 is connected to the support element 2 by means of a threaded connection, which has a reduced overall dimension along the longitudinal axis 9 and in plan, compared to that of traditional solutions which provide for the realization of a support element that delimits a seat into which the bottom end of the pole must be inserted. It is quite clear that the size of a threaded stem is objectively smaller than that of the diameter of a support pole for an awning.

[0107] Furthermore, the support system 1 does not provide for the realization of a drainage since, unlike the traditional type solutions, it has no seat wherein to house the lower end of the pole to ensure the support of the latter and, therefore, it has no cavity wherein stagnation can form.

[0108] The threaded seat 12 of the support element 2 is protected both when the pole 4 is not connected to the support element 2 itself, by means of the socket screw 25 which closes the hole delimited by the threaded seat 12, and when the pole 4 is screwed to the support element 2, since the threaded pivot 21 occludes the hole delimited by the threaded seat 12. The coupling between the pole 4 and the support element 2 defines a seal, preventing liquids or dirt from accumulating in the inside of the support element 2.

[0109] The installation and removal of the pole 4 relative to the support element 2 is practical and easy to perform, favoring the use of the support system 1 by any user.

[0110] Furthermore, the support system 1 allows the pole 4 to rotate selectively around the longitudinal axis 9 and to align itself with the stresses transmitted by the awning, ensuring a high resistance in correspondence with the connection with the support element 2, i.e. in correspondence of the bottom end of the pole 4 which, in use, is the one most subjected to stresses.

[0111] In the foregoing, the preferred embodiments have been described and variants of the present invention have been suggested, but it is understood that those skilled in the art will be able to make modifications and changes without thereby departing from the relative scope of protection, as defined by the claims attached.

Claims

1. Support system (1) configured to be coupled to an anchoring surface (3), wherein the support system (1) comprises:

   a support element (2) configured to be connected to said anchoring surface (3),
   a pole (4),
   a connecting element (5) engaged at a hollow bottom end of said pole (4),
   a retaining element (16) which removably connects said pole (4) and said connecting element (5) to each other, so that said pole (4) is con-

strained to said connecting element (5) along a longitudinal axis (9) and is selectively rotatable with respect to said connecting element (5) around said longitudinal axis (9),
wherein said connecting element (5) comprises an engagement portion (13) which removably engages said hollow bottom end of said pole (4), wherein said engagement portion (13) defines an annular seat (15) engaged at least partially, in a removable way, by said retaining element (16), when said pole (4) is connected to said connecting element (5),
wherein said connecting element (5) defines a threaded central seat (20) which extends passing through said engagement portion (13), wherein said engagement portion (13) ends with a flanged portion (14) through which said connecting element (5) is configured to abut with said support element (2), said central threaded seat (20) being engaged by a threaded pivot (21) which extends for at least a portion outside said connecting element (5), through said flanged portion (14).

2. Support system (1) according to claim 1, wherein said retaining element (16) comprises a connecting screw (17) which removably engages an opening (18) made through at said hollow bottom end of said pole (4) and comprises a bushing (19) configured to removably engage said annular seat (15) and to be removably engaged, in turn, by said connecting screw (17).

3. Support system (1) according to claim 2, wherein said bushing (19) is interposed between said pole (4) and said annular seat (15).

4. Support system (1) according to any one of claims 1 to 3, comprising a locking element (23) positioned along said annular seat (15) and configured to define a selective abutment for said retaining element (16) along said annular seat (15) and to limit the rotation of said pole (4) relative to said connecting element (5) around said longitudinal axis (9).

5. Support system (1) according to claim 4, wherein said locking element (23) has an engagement portion which engages a seat (24) delimited along said annular seat (15) and a head portion which extends inside said annular seat (15) and remains within the plan dimensions of said annular seat (15) so as not to interfere with said pole (4).

6. Support system (1) according to any one of claims 4 or 5, wherein said locking element (23) limits the relative rotation between said pole (4) and said connecting element (5) to an angle equal to or less of 350°.

7. Support system (1) according to claim 1, wherein when said pole (4) is connected to said support element (2), said threaded pivot (21) engages at least a portion of a delimited threaded seat (12) along said support element (2).

8. Support system (1) according to claim 7, comprising a socket screw (25) engaged along said threaded seat (12) occluding an access opening inside said threaded seat (12), wherein said socket screw (25) has a head portion delimiting a recess (26) configured to be selectively engaged, by means of a shape coupling, by a free end (27) projecting from said threaded pivot (21).

9. Support kit for an awning comprising a plurality of support systems (1) according to any one of claims 1 to 8.

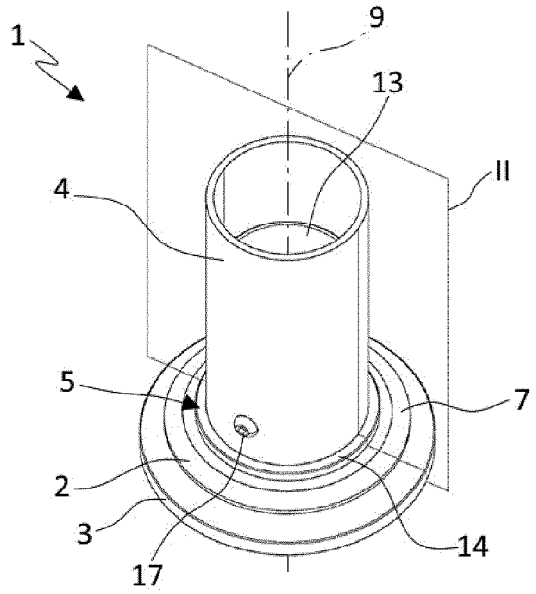

FIG.1

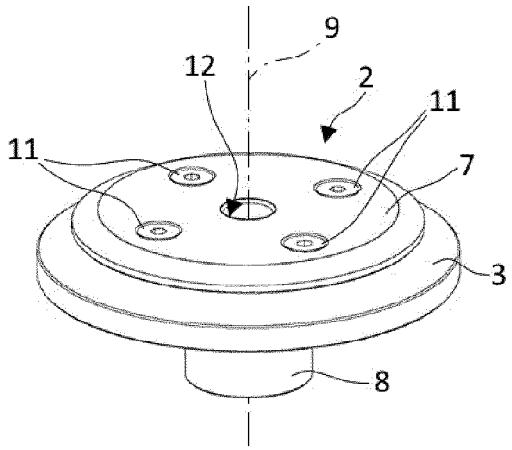

FIG.5

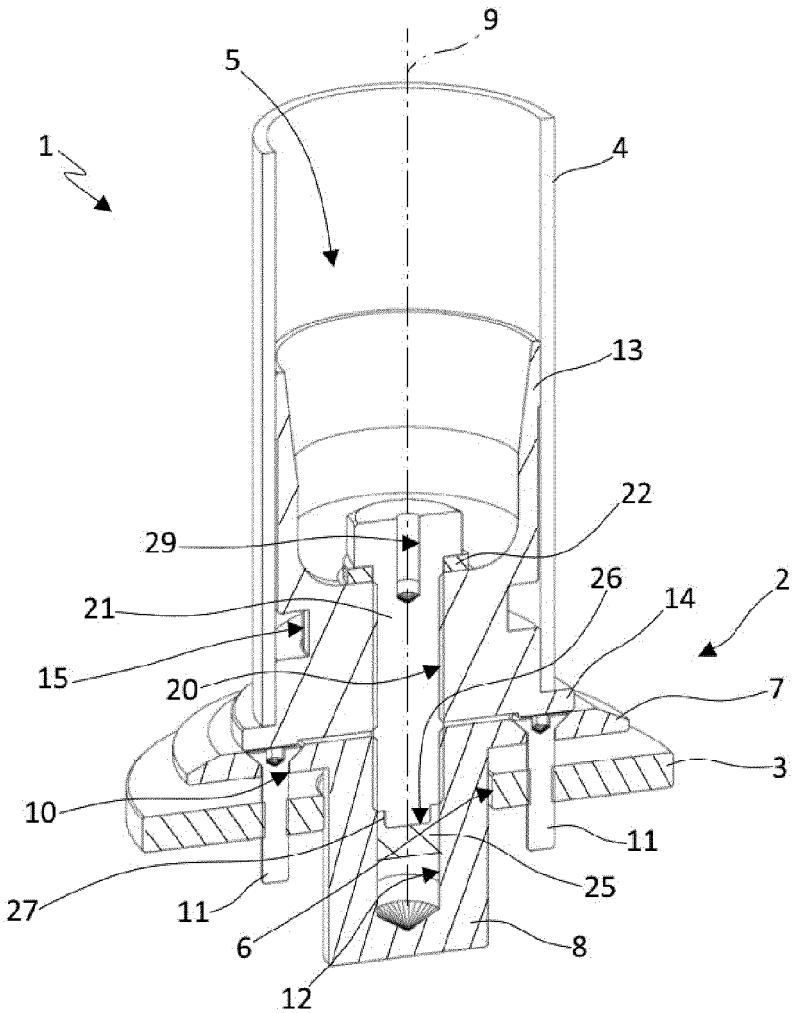

FIG.2

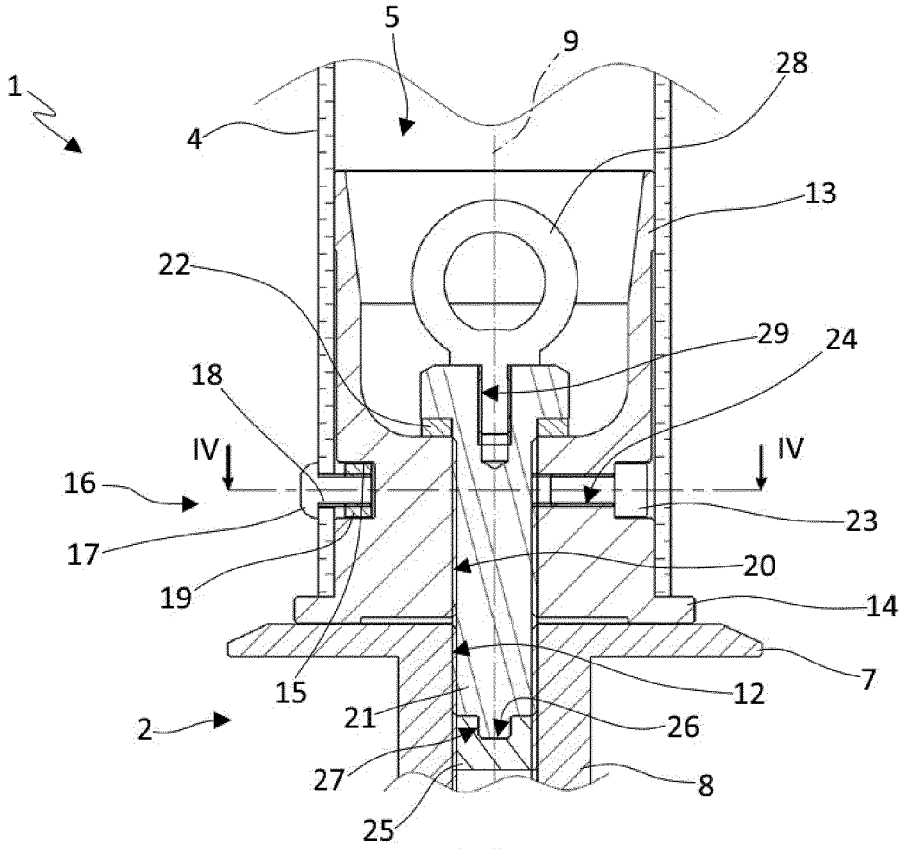
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FIG.3

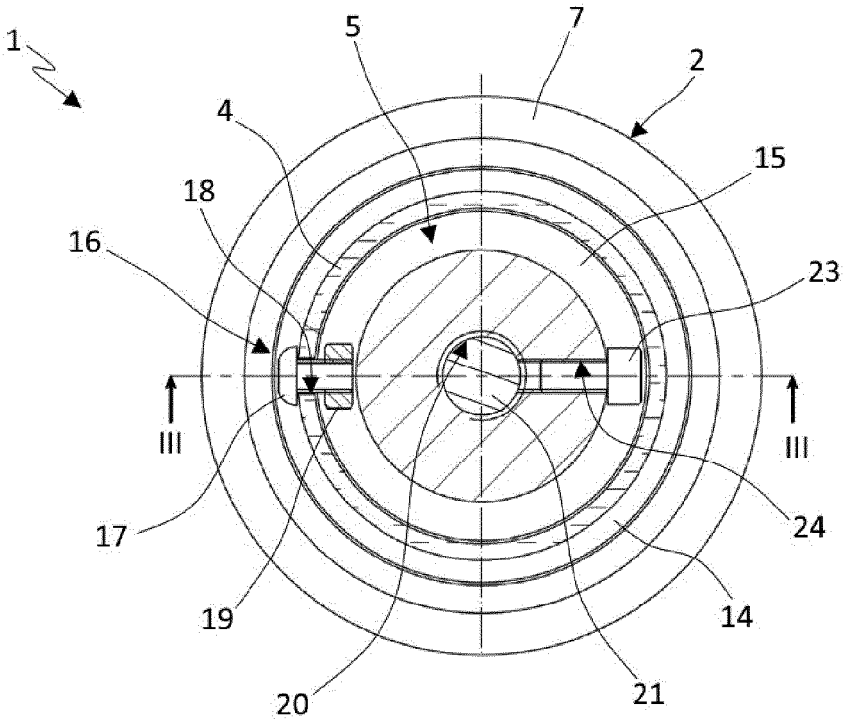
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FIG.4

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EUROPEAN SEARCH REPORT

Application Number
EP 21 20 9398

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	US 7 093 558 B1 (MANDANICI GLENN [US]) 22 August 2006 (2006-08-22) * abstract * * figures *	1-9	INV. B63B17/02
A	US 2009/189038 A1 (JAMES TIMOTHY R [US]) 30 July 2009 (2009-07-30) * abstract * * figures *	1-9	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 March 2022	Gardel, Antony

CATEGORY OF CITED DOCUMENTS

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17-03-2022

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