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(54) **Boundary box with locking mechanism for cover**

(57) A surface box (8) is used for flush installation in a street, pavement, floor or open terrain to hide underground installed elements in such a way that these elements remain accessible. The surface box comprises a

bottomless casing (10) having an internal cavity (15). The casing is provided with a lid (30) closing said cavity (10) at an upper side thereof. Said lid is preferably formed of plastic and is provided with means (40,52,72) which hold said lid in place.

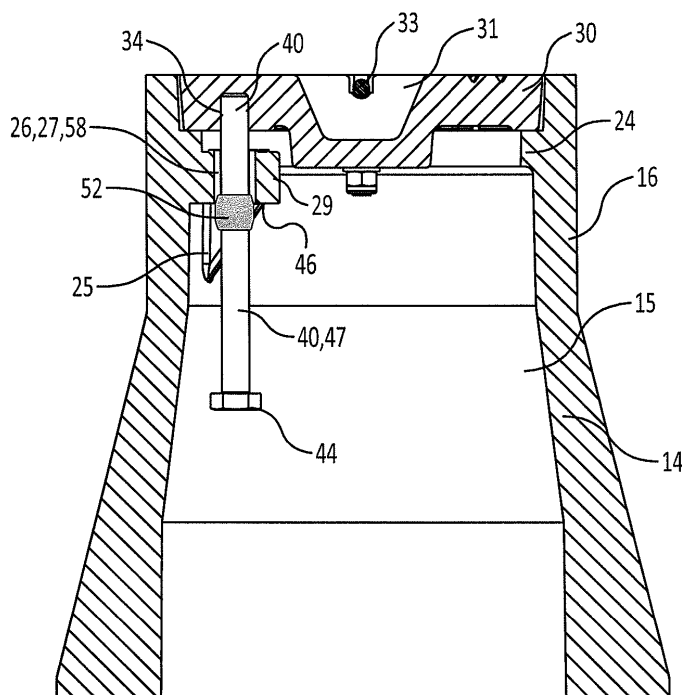


Fig.3

Description

[0001] The present invention relates to a surface box suitable for installation in a street, pavement, floor or open terrain to hide underground installed elements in such a way that these elements remain accessible, comprising a casing with a bottomless cavity, which is provided with a lid closing said cavity at an upper side thereof.

[0002] Surface boxes are installed substantially plane in the pavement of streets or sidewalks in relation to the construction of underground networks for water, sewage, gas or district heating, in order to enable access to closing valves or hydrants below street level. Underground installed metering points are also protected by means of street surface boxes. The elements to be protected are situated in an excavated pit which pit is filled afterwards. The surface can then be asphalted or paved. The surface box levels plane with the surface of the street; it should preferably neither protrude above nor sink below the surface of the street.

[0003] The surface box is often a casted element with a round, rectangular or oval form and with an sunken lid of cast iron, which has a bridge for lifting the lid. The lid of the surface box must have a minimum weight, in order to resist the suction effect when cars pass over the surface box and to prevent an uncontrolled raising and removing of the lid.

[0004] Documents DE 100 09 871 A1 and DE 94 21 800 U1 describe surface boxes, which have a security pin for lifting and turning the surface box aside. Several locking mechanisms, like screw connections, prevent the lid of the surface box to be opened. The lid can be mounted rotationally on a vertically positioned screw bolt, which is fixed to the surface box. When tightening a nut the lid will be drawn against a protrusion being formed within the internal cavity of the casing. In this way, the lid is tensioned against the casing. When unscrewing the nut, the lid can be lifted and be turned aside.

[0005] Surface boxes can also be made of plastic. Utility model 20 2006 004 541 U1 discloses a plastic surface box, which has a tensioning mechanism for holding the lid in the casing, such that the lid will not be removed from the casing by the suction effect of a car when it passes over the surface box. The spring of the tensioning mechanism can be dimensioned such, that it simulates the weight of a usual lid of a street surface box, like a cast iron lid. Plastic surface boxes can be produced much cheaper and are easier to handle.

[0006] The surface boxes mentioned above have the disadvantage, that the locking mechanism has not been constructed in an optimal way and that opening and closing of the surface boxes is often complicated.

[0007] It is an aim of the present invention to remedy the disadvantages of the prior art and to present a surface box which, firstly, can be opened easily and, secondly, has a lid which will not be removed from the casing by the suction effect of cars when they pass over the lid. Moreover, it is an aim of the invention to present such a

surface box which is difficult accessible for unauthorized people, but can be opened by authorized people without any problem.

[0008] To this end a first embodiment of a surface box as described in the opening paragraph according to the invention is **characterized in that** a shaft extends from said lid into said cavity and is provided with a snap-in member, in that said casing is provided with a snap guidance, and in that said snap-in member engages said snap guidance upon closing of the surface box. The snap-in member has the advantage that the lid can be lifted and closed easily. The lid can only be opened against the force of the snap-in mechanism. Because the snap-in member is provided at the shaft, the lid can firmly interlock with the snap guidance in the casing, so that the lid cannot be loosened, not even by the suction effect of a car when it passes over the lid.

[0009] Because the lid is tensioned against the casing, it need not be very heavy in order to resist lifting or removing. Thus, the lid can be made of a relatively light material, like for instance plastic. However, the lid should have sufficient statical stability, for instance by the provision of strengthening ribs.

[0010] It is particularly advantageous when the snap-in member is resilient, because then the snap-in member can very easily snap into the provided snap guidance. When locking or unlocking, the snap-in member will only be deformed insignificantly. Depending on the elasticity of the snap-in member, a corresponding force is needed to open the lid. Additional locking means for the surface box are not necessary, because the resilient snap-in member firmly holds the lid on the casing.

[0011] A further preferred embodiment has a spring-loaded snap-in member. The spring enables the snap-in member to snap into the snap guidance with tension. In this case, the above mentioned elasticity of the snap-in member is no longer necessary. However, a snap-in member which is spring-loaded and at the same time resilient can of course also be used. The lid can only be opened against the force of the spring. When such spring is made of metal, it has the advantage that it is not susceptible to temperature fluctuations and provides, based on the properties of the metal, a durable and undisturbed function. Therefore, there is no need for additional locking mechanisms when spring loaded snap-in members are used.

[0012] In a further preferred embodiment the surface box according to the invention is **characterized in that** said snap-in member traverses said snap guidance to a side across from said lid upon closing of said lid. In this manner the snap-in member will slip behind the snap guidance once the lid is in a closed position, rendering an easily noticeable locked state of the lid.

[0013] In a still further preferred embodiment, the surface box according to the invention is **characterized in that** said lid carries a bolt extending substantially transversely into said cavity and being received through a bolt guidance of said casing, and in that said bolt com-

prises a bold head at its free end which blocks a further passage of said bolt through said bolt guidance upon opening of the surface box to access said cavity. In a further advantageous construction, the snap guidance is formed by the bolt guidance. This measure guarantees that opening and closing of the surface box can be done in a very simple way. The bolt guidance will keep the bolt in position during opening and closing of the surface box. The bolt will be guided vertically down through the bolt guidance, so that jamming of the bolt during opening or closing of the surface box will be avoided. Consequently, additional measures for locking the bolt to the casing of the surface box are not necessary.

[0014] In a further advantageous construction, the bolt has a recess in which the snap-in member is accommodated. This means that the bolt has two functions. Firstly, the bolt has the function of assisting lifting the lid of surface box, and, secondly, the bolt is provided with the snap-in member to lock said lid in place. Therefore, no additional elements in the surface box are necessary for the provision of the snap-in member. The snap-in member will be kept in an easy and permanent way in its position at the bolt.

[0015] In a preferred construction the snap-in member has a cylindrical form and surrounds the bolt in a firm and close manner. The cylindrical form of the snap-in member guarantees a close connection between the bolt and the snap-in member with a uniform contact. The snap-in member can also be elastic; it can for instance be made of rubber or plastic.

[0016] It is particularly appropriate, when at least one end portion of the cylindrical snap-in member tapers down, and particularly has a conical shape. With such shape of the snap-in member, the locking action into the snap guidance of the bolt will follow rather easily, because the snap-in member is guided as a result of its tapered shape into the snap guidance without the risk of blocking against edges or rims. If both ends of the cylindrical snap-in member are provided with a tapering or conical shape, then both the locking action and the un-

locking action can be carried out easily.

[0017] It is advantageous, when the snap guidance is formed in a projection of the casing in which the snap-in member can interlock with the snap guidance. The snap guidance can for instance also be constructed such that, in stead of the bolt guidance, one or more guiding pins form the snap guidance, being arranged within the internal cavity of the casing. The projection can be arranged anywhere in the casing and can, depending on its form, give the bolt additional stability.

[0018] In a further advantageous construction the surface box according to the invention is provided with a locking-out mechanism in order to loose the snap-in member from the snap guidance. The locking-out mechanism can for instance be unlocked by means of a special key or a special tool in order to open the lid. Such locking-out mechanism makes it extra difficult for unauthorised people to open the lid. Preferably said special key more-

over enables the operation of a closing valve or other member inside the surface box. Moreover, a locking-out mechanism makes it more easy to loose the snap-in member.

5 **[0019]** In order to provide for such a locking-out mechanism, a surface box as described in the opening paragraph is, according to a further aspect of the invention, **characterized in that** in that the lid carries a bolt which extends through a bolt guidance within said cavity and
10 through a bore in said lid, in that said bolt is provided which a spiral guidance and in that at least one guidance projection is provided within said bore to cooperate with said spiral guidance of the bolt in order to lock the surface box.

15 **[0020]** In a specific embodiment a bush is provided within said bore of said lid and said bush comprises said at least one guidance projection, which cooperates with said spiral guidance of the bolt in order to lock the surface box. Such locking mechanism is particularly advantageous, because the guidance projection fits perfectly into the spirally formed guidance of the bolt and because the lid is firmly connected with the bolt. The bush is situated in the bore of the lid, and provides for extra stability during opening and closing of the surface box. Thus, the bolt
25 will not only be supported by the bolt guidance, but also by the bush, so that the bolt will not be jammed when opening or closing the surface box. The bush and the spirally formed guidance can be made of plastic or metal. Rigid materials, like metal, are less subject to wear; plastic materials offer, when it is frosty outside, a protection
30 against icing of the closing mechanism and, moreover, is not prone to corrosion.

[0021] It is particularly advantageous that the closing mechanism is situated entirely in the lid. If the closing mechanism should be defective, the lid may be exchanged without any problem.

35 **[0022]** In an advantageous construction of the invention the guidance projection of the bush is formed as a guidance pin and the spiral guidance of the bolt is formed as a groove. When the bolt is rotated, the guidance pin interlocks with the groove of the spiral guidance. This effects a close connection between guidance projection and spiral guidance and consequently a close connection between the bolt and the lid.

40 **[0023]** It is particularly advantageous, when the guidance projection of the bush is formed as an inside thread and the spiral guidance of the bolt as an outside thread. The guidance projection being formed as an inside thread interlocks with the spiral guidance of the bolt being
45 formed as an outside thread. The bolt will, when being rotated, move in a vertical direction. Depending on the choice of the material for the outside and inside thread, the bolt can be rotated almost without friction.

[0024] In a preferred construction, the lid has a hole, through which the bolt is accessible from the outside. In this way, it is guaranteed that the bolt is easily accessible for authorized persons, in order to open or close the surface box.

[0025] In a further advantageous construction, the bolt has coupling means in order to enable a corresponding operating tool to open or to close the lid. Such coupling means can for instance be a machined out recess for a wrench or an inner hexagonal for a hexagonal tool. Rotation tools, like a wrench or a hexagonal tool, move the bolt in the bush in an upward or downward direction. The coupling means can also be formed in such a way that only special tools can be used for rotating the bolt.

[0026] It is particularly advantageous when the bolt has a closing and/or a snap-in member. Because the bolt can snap-in in the closed position, the lid is firmly connected to the bolt. This measure guarantees that the lid cannot be removed by unauthorised people and moreover will not rattle when closed.

[0027] In a further advantageous construction the surface box has a spring, which tensions the bolt in its axial moving direction. The spring keeps the lid firmly on the casing and avoids that the lid will loosen spontaneously by the suction effect of cars passing over the surface box or other external causes.

[0028] Further technical details and advantages will be clear from the dependent claims and from the drawings together with the corresponding description. The invention will be described in further detail below with reference to a number of explanatory embodiments and an accompanying drawing, in which:

- Fig. 1 shows a plan view of a first embodiment of a surface box according to the invention, being closed by a lid;
- Fig. 2 shows a perspective cross-sectional view of the surface box of figure 1, showing a snap-in member according to the invention;
- Fig. 3 shows a schematic cross-section of the surface box of figure 1 and 2;
- Fig. 4 shows a three-dimensional view of the snap-in member as applied in the surface box of figure 1 and 2;
- Fig. 5 shows a detailed view of the snap-in member of figure 4;
- Fig. 6 shows in a schematic cross-section of a second embodiment of a surface box according to the invention;
- Fig. 7 shows a plan view of the surface box of figure 6;
- Fig. 8 shows a three-dimensional detail of a bolt as applied in the surface box of figure 6 and 7;
- Fig. 9 shows a three-dimensional detail of a bush as applied in the surface box of figure 6 and 7;
- Fig. 10 shows a three-dimensional detail of the bolt of figure 8 with the bush of figure 9 in a mutually unlocked orientation; and
- Fig. 11 shows a three-dimensional detail of the bolt of figure 8 with the bush of figure 9 in a mutually locked state.

[0029] Corresponding parts in the drawings have been

provided with same reference signs.

[0030] Figure 1 shows a plan view of a first surface box 8 with a lid 30. Figure 2 shows a perspective cross-sectional view of the surface box 8. In figures 1 and 2 reference sign 10 indicates a casing made of plastic. The casing 10 has a jacket form, surrounding an internal cavity 15, and is, in the present embodiment conically converging in the upward direction. The casing 10 has at its lower end a radially outward extending annular foot 12, where a truncated cone 14 is joined. The truncated cone 14 is followed by a cylindrical part 16. The cylindrical part 16 has circumferential ribs 18 and 20, and an outward projecting rim 22 at the upper end. The rim 22 has a step 24 at its inner side, on which step 24 the lid 30 is resting. For strengthening purposes the casing 10 has longitudinal ribs 28.

[0031] The lid 30 is formed as a circular plate, which has a downward projecting rim 32 for resting upon the step 24 of the casing 10. Although the lid may be made of any suitable material, like particularly of cast iron, in this embodiment the lid 30 is a relatively light weight corrosion free plastic element which can be produced in a simple manner, for instance by means of injection moulding. The lid 30 has a slot 34 with an inside thread, in which a bolt 40 has been screwed. The bolt 40 is guided through a bolt guidance 26 and then screwed in said slot 34. This bolt guidance 26 is formed by a vertical bore 27 being made in a projection 29. Strengthening ribs 25 are provided in order to strengthen the bolt guidance 26. The bolt guidance 26 is situated within the internal cavity 15 of the casing 10. The bolt 40 has a bolt head 44 at its end. The bolt 40 is rotationally mounted in the bolt guidance 26 and can be displaced vertically until the bolt head 44 will bounce against a stop 46.

[0032] The lid 30 can be removed from the casing 10. A recess 31 in the lid 30 is bridged by a bridge 33. An opening tool can be put under the bridge 33 for lifting the lid 30. The lid 30 can however only be lifted in vertical direction as far as the bolt 40 enables such lifting. The stop 46 being formed by the bolt guidance 26 avoids that the lid 30 will be lifted over a distance being more than the length of the bolt 40. The lid 30 will be kept in a vertical orientation by the bolt 40. Because the bolt is connected to the lid excentrically, the lid can, in the lifted position, be turned aside around the axis 50 of the bolt 40. A snap-in member 52 is provided in a recess 56 of the bolt 40. The snap-in member 52 has a cylindrical form and surrounds the bolt 40 where the recess 56 is formed.

[0033] Figure 3 shows the snap-in member 52 in a detailed view. The bolt 40 is guided by the bolt guidance 26. The snap-in member 52 is provided in the recess 56 of the bolt 40. Upon opening of the lid 30, the snap-in member 52 will be pushed into the recess 56 of the bolt 40. If the snap-in member 52 is constructed to be resilient, then the snap-in member 52 will completely disappear into the recess 56 of the bolt 40. Upon closing of the lid 30, the bolt 40 will be pushed downward and the snap-in member 52 will interlock with a snap guidance 58.

[0034] In this embodiment, the snap guidance 58 is formed by the bolt guidance 26. In order to be unlocked, the snap-in member 52 must pass through the bore 27 in an upward direction. Correspondingly, in order to be locked, the snap-in member 52 must pass through the bore 27 of the bolt guidance in a downward direction. The snap guidance 58 can however also be formed as in another projection and be situated at any place within the internal cavity 15 of the casing 10. Such projection can also be constructed in such a way that it additionally stabilizes the bolt 40. The snap-in member 52 has a conical shape in both end portions 54 towards the frontal faces 55.

[0035] Figures 4 and 5 show the snap-in member 52 in a detailed sketch. In this embodiment the snap-in member 52 is constructed as a cylinder which converges conically in the portions 54 towards both frontal faces 55. A cylindrical form of the snap-in member 52 enables a very close connection between the bolt 40 and the snap-in member 52. It is particularly advantageous, when the conically converging portions 54 of the snap-in member 52 have an angle 53 of about 70° with respect to the frontal face 55. With such conical construction the snap-in member 52 can very easily be inserted into the snap guidance 58.

[0036] The snap-in member 52 can be made of different materials. Rigid materials, like metal, are very resistant to wear. Temperature fluctuations have no influence on the durability of the rigid snap-in members 52. Therefore, they have a better durability as flexible materials. On the other hand, such rigid snap-in members 52 must sometimes have a spring loaded construction, in order to be able to pass through the small bore 27 of the bolt guidance 26.

[0037] Flexible materials, like rubber or soft plastic, do not need additional springs; such materials enable opening and closing of the lid 30 with very less friction, because the snap-in member 52, when passing through the bore 27, yields in a flexible way.

[0038] Depending on the constructional form of the snap-in member 52 there are various mechanisms for unlocking the snap-in member. Rigid snap-in members 52 can for instance be pushed into and out of the recess 56 of the bolt 40 by means of a spring loaded member. Flexible snap-in members 52 can be pushed into the recess 56 just by pressure, for instance when opening the lid 30. When closing the lid 30 the snap-in member 52 will automatically snap into the snap guidance 58.

[0039] The snap-in member 52 allows opening and closing of the lid 30 of a surface box 8 in a very quick and uncomplicated way. Separate opening tools are not necessary and an extra safety lock of the lid 30, for instance by means of screws, can also be left out. By locking the snap-in member 52 into the snap guidance 58 the lid 30 will be firmly held into the surface box 8, so that even a suction effect when cars pass over the surface box will not cause lifting or opening of the lid 30.

[0040] Figures 6 and 7 show in a principal sketch a

cross-section and a plan view, respectively, of a second embodiment of a surface box 8 according to the invention with a lid 30 in place. The surface box 8 consists of a casing 10 which is closed by the lid 30. The casing 10 and the lid 30 are made of corrosion resistant plastic. However, especially the lid may alternatively be formed of cast iron or any other suitable material as well. The lid 30 rests in a rim 22 of the casing 10 at an upper side thereof and is plane with the casing 10. A recess 31, which is bridged by a bridge 33, enables the lid 30 to be lifted out of this rim of the casing. An opening tool can be put under the bridge for lifting the lid 30.

[0041] A bolt 40 is positioned excentrically in a bore 35 of the lid 30. Coupling means 49 on the bolt 40 enable the bolt 40 to be unlocked. The bolt 40 is received in a bolt guidance 26, which is formed by a vertical bore 27 through a projection 29 of the casing 10. The projection 29, together with the bolt guidance 26, is situated at the inner side of the casing 10 where it comprises an internal cavity 15. The bolt 40 is rotationally mounted in the bolt guidance 26 and can move in a vertical direction. At its free end, the bolt 40 is provided with a bolt head 44.

[0042] The bolt 40 is guided by a metal bush 71 within the lid 30, having at least one guidance projection 72 which cooperates with a spirally formed guidance 48 on the bolt 40. The bush 71 is mounted in a bore 35 of the lid 30 which extends throughout the lid 30 and provides for an additional stability. A spring 76, which is situated at the lower end of the bolt 40 between the bolt head 44 and the projection 29, tensions the bolt 40 in its axial direction as the bolt 40 is rotated in a clock-wise direction in the bolt guidance 26 to close the lid 30.

[0043] To unlock the bolt 40 from the lid 30 a turning tool is put into coupling means 49 of the bolt 40. The bolt 40 will be unlocked by rotating the turning tool in a counter clockwise direction until the projection 72 is entirely released by the spiral bolt guidance 48,74. Said turning tool can for instance be a hexagonal tool which will be inserted into the hexagonally formed coupling means 49 of the bolt 40. The opening motion of the bolt is assisted by the spring tension of the spring 76, which relaxes as the bolt head 44 is forced downwards away from the projection 29 thereby giving space to the spring. When the spiral guidance 48 of the bolt 40 releases the projection 72 inside the bush 71, the bolt 40 is completely rotated out of the lid 30 and the lid 30 may be removed completely from the bolt 40 and, hence, from the casing 10 to expose the cavity 15 inside the surface box 8.

[0044] Figure 8 shows the bolt 40 with the inventive spiral guidance 48. The bush 71 is not shown. The bolt 40 consists of the bolt head 44, a bolt shaft 47 and the spiral guidance 48 at the upper side. The bolt 40 has at its upper end coupling means 49, suitable to be connected with a turning tool, in order to rotate the bolt 40 out of or into the bush 71,72. The spiral guidance 48 is situated at the outside of the bolt 40 and consists in this embodiment of an outside thread 74. Other guidance forms in stead of the spiral guidance are possible. The outside

spiral thread 48,74 ends in a snap-in member 75 for firmly locking the bolt 40 over a projection 72 with the lid 30 in place.

[0045] Figure 9 shows the inventive bush 71 in detail. This bush has at its inner side a guidance projection 72, which has in this embodiment the form of a pin. This pin fits like an inside thread into the outside thread of the spiral guidance 48 and snaps into the snap-in portion 75.

[0046] Figure 10 shows the bolt 40 in the position where the lid 30 is opened. The bush 71, positioned in a bore 35 of the lid 30, is released from the spiral guidance 48 on the bolt 40, so that the lid 30, together with the bush 71, may be lifted. When unlocking the bolt 40 from the lid 30 the bolt 40 rotates spirally in an downward direction, around its axis, over the outside thread 74 of the spiral guidance 48. When unlocking is complete, the guidance projection 72 is released from the spiral guidance 48 and the lid 30 is unlocked from the bolt 40. Figure 11 shows the bolt 40 in the closed position of the lid 30. The spiral guidance 48 is rotated maximally into the bush 71 over the projection 72 until the projection 72 snaps into the snap-in portion 75 of the guidance 48,74. In this state, the lid 30 is firmly connected to the bolt 40.

[0047] Although the invention has been described in greater detail with reference to only a few embodiments it will be appreciated that the invention is by no means limited to the embodiments provided. On the contrary may alternative embodiment are feasible for a skilled person without departing from the true scope and spirit of the present invention. As such the spiral lock of the second embodiment may be combined with the snap-in lock of the first embodiment in a surface box to provide both guiding and snapping at one side as well as more permanently locking at another. Also the casing and the lid may both be made of (cast) iron, a suitable plastic or any combination. In the embodiments given, the casing has a circular plan cross section. However, other forms of the casing and corresponding lid are also feasible, like for instance an oval shape or a rectangular form.

Claims

1. A surface box (8) suitable for installation in a street, pavement, floor or open terrain to hide underground installed elements in such a way that these elements remain accessible, comprising a casing (10) with a bottomless cavity (15), which is provided with a lid (30) closing said cavity at an upper side thereof **characterized in that** a shaft (40) extends from said lid into said cavity and is provided with a snap-in member (52), **in that** said casing is provided with a snap guidance (58), and **in that** said snap-in member (52) engages said snap guidance (58) upon closing of the surface box.
2. A surface box according to claim 1 **characterized in that** said snap-in member (52) traverses said snap

guidance (58) to a side across from said lid (30) upon closing of said lid.

3. A surface box according to claim 1 or 2 **characterized in that** said lid carries a bolt extending substantially transversely into said cavity (15) and being received through a bolt guidance (26) of said casing, and **in that** said bolt comprises a bolt head (44) at its free end which blocks a further passage of said bolt through said bolt guidance upon opening of the surface box to access said cavity (15).
4. A surface box according to claim 3 **characterized in that** said bolt comprises said shaft (40) and **in that** said bolt guidance (26) comprises said snap guidance (58).
5. A surface box according to anyone of the preceding claims, **characterised in that** the snap-in member (52) is resilient.
6. A surface box according to anyone of the preceding claims, **characterised in that** the snap-in member (52) is spring loaded.
7. A surface box according to anyone of the preceding claims, **characterised in that** the snap-in member (52) comprises a cylindrical body on said shaft (40).
8. A surface box according to claim 7 **characterized in that** said body tapers down in a portion (54) towards a frontal face (55) thereof, particularly in a conical slope, more particularly at a slope of about 70 degrees with respect to said frontal face (55).
9. A surface box according to claim 7 or 8, **characterised in that** the shaft (40) has a recess (56) which accommodates the snap-in member (52).
10. A surface box according to anyone of the preceding claims, **characterised in that** the snap guidance (58) extends through a projection situated in the casing (10).
11. A surface box (8) according to anyone of the preceding claims, **characterised by** a mechanism for loosening the snap-in member (52) from the snap guidance (58).
12. A surface box (8) suitable for installation in a street, pavement, floor or open terrain to hide underground installed elements in such a way that these elements remain accessible, comprising a casing (10) with a bottomless cavity (15), having a lid (30) at an upper side thereof which closes said cavity (15), **characterized in that** the lid (30) carries a bolt (40) which extends through a bolt guidance (26) within said cavity (15) and through a bore (35) in said lid (30), **in**

that said bolt (40) is provided which a spiral guidance (48) and **in that** at least one guidance projection (72) is provided within said bore (35) to cooperate with said spiral guidance (48) of the bolt (40) in order to lock the surface box.

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13. A surface box according to claim 12 **characterised in that** a bush (71) is provided within said bore (35) of said lid (30) and **in that** said bush (71) comprises said at least one guidance projection (72) which co-operates with said spiral guidance (48) of the bolt (40). 10
14. A surface box according to claim 12 or 13, **characterised in that** said at least one guidance projection (72) comprises at least one guidance pin and **in that** said spiral guidance (48) of said bolt (40) comprises a spiral groove. 15
15. A surface box (8) according to claim 12 or 13, **characterised in that** the guidance projection (72) within said bore (71) comprises an internal spiral thread and **in that** the spiral guidance (48) on said bolt (40) comprises an external thread. 20
25
16. A surface box (8) according to anyone of the claims 12 to 15, **characterised in that** the bolt (40) comprises coupling means (49) at an exposed surface thereof requiring a corresponding operating tool to open or to close the lid. 30
17. A surface box (8) according to anyone of the claims 12 to 16, **characterised in that** the bolt (40) is provided with a closing and/or a snap-in member (75). 35
18. A surface box (8) according to one of the claims 12 to 17, **characterised in that** said bolt (40) is provided with a spring (76), which tensions the bolt (40) in its axial direction in a locked state of said lid. 40
19. A surface box according to anyone of the preceding claims **characterized in that** said lid (30) is made of plastic. 45

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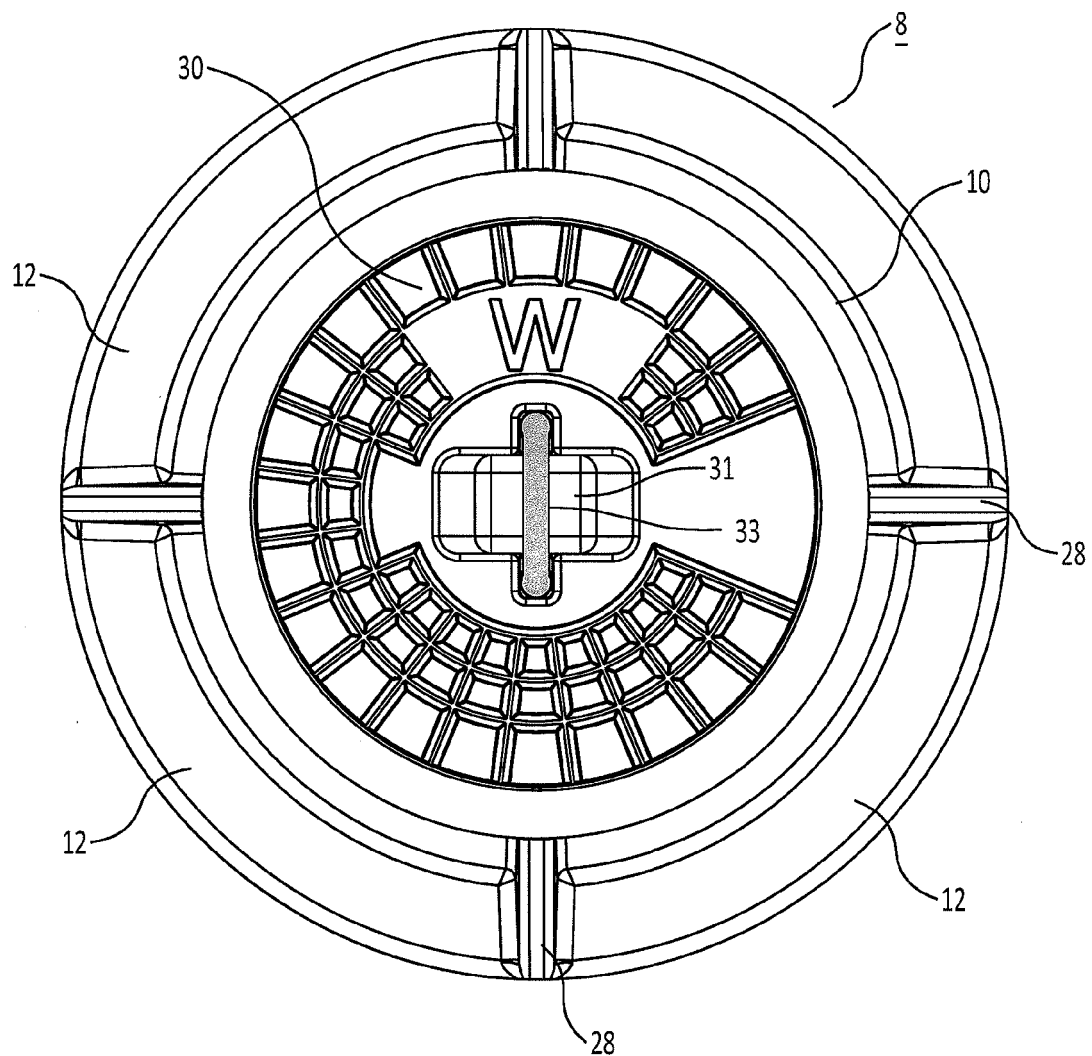


Fig.1

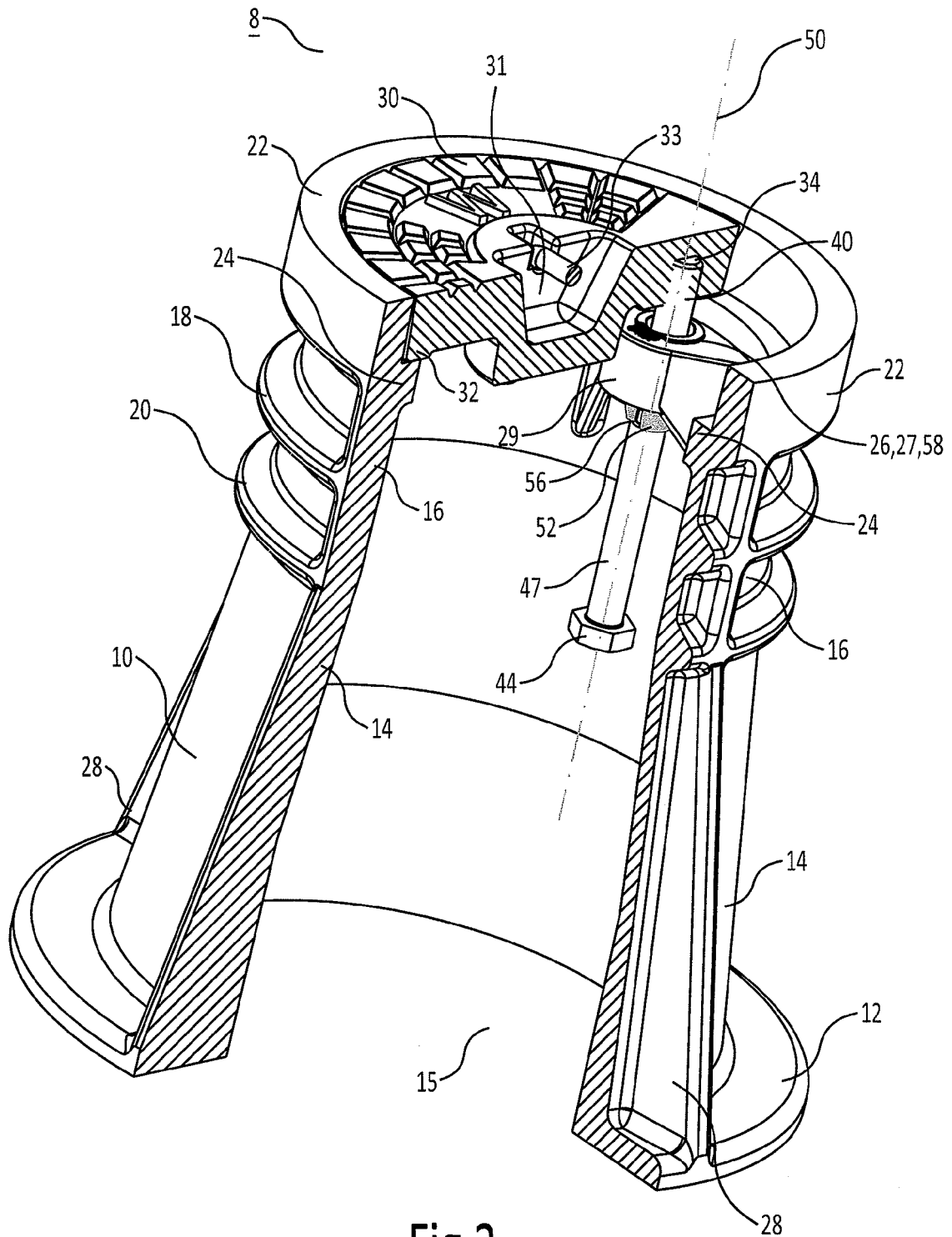


Fig.2

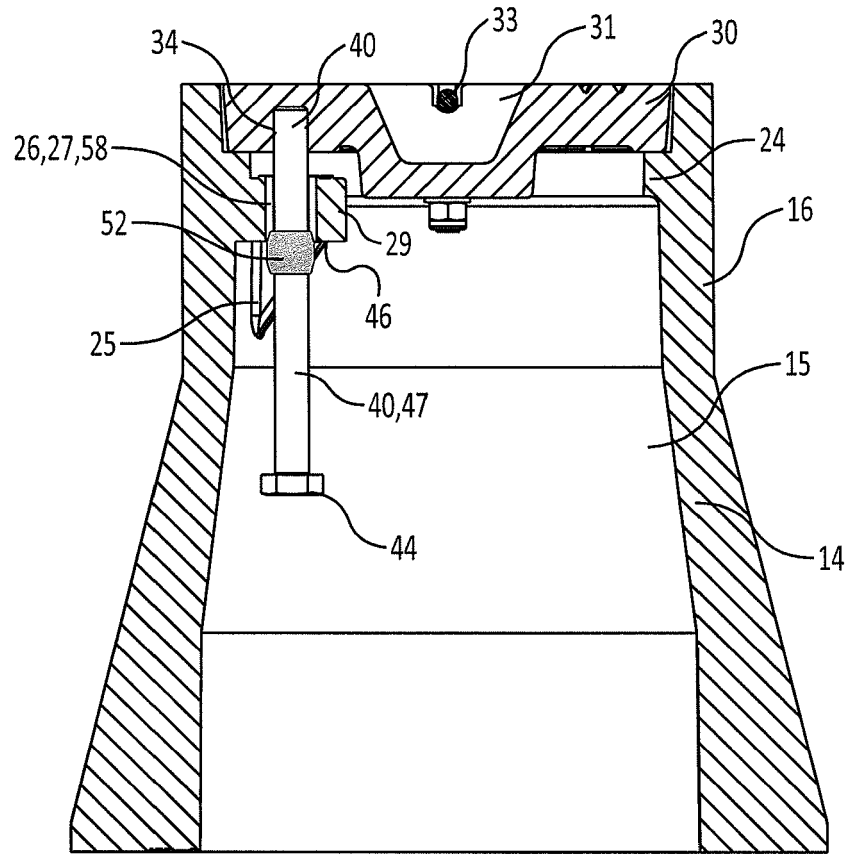


Fig.3

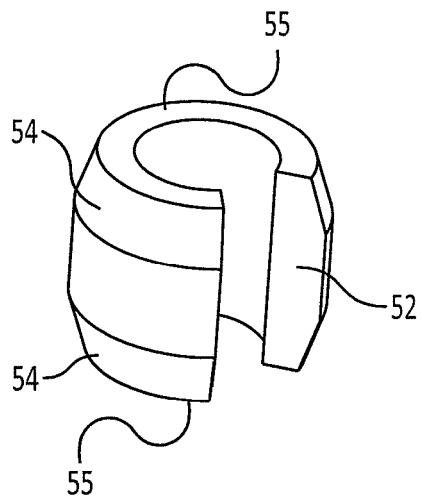


Fig.4

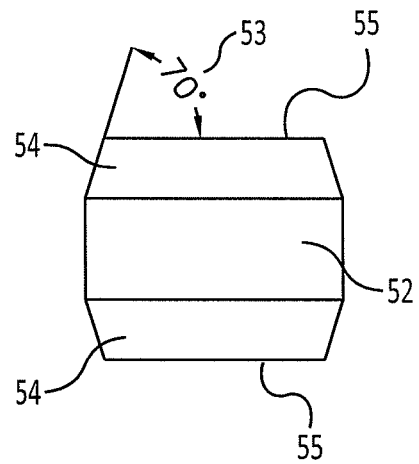


Fig.5

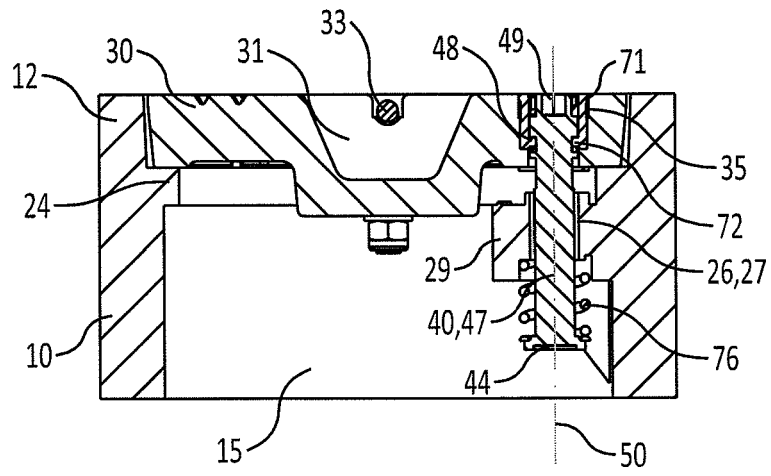


Fig.6

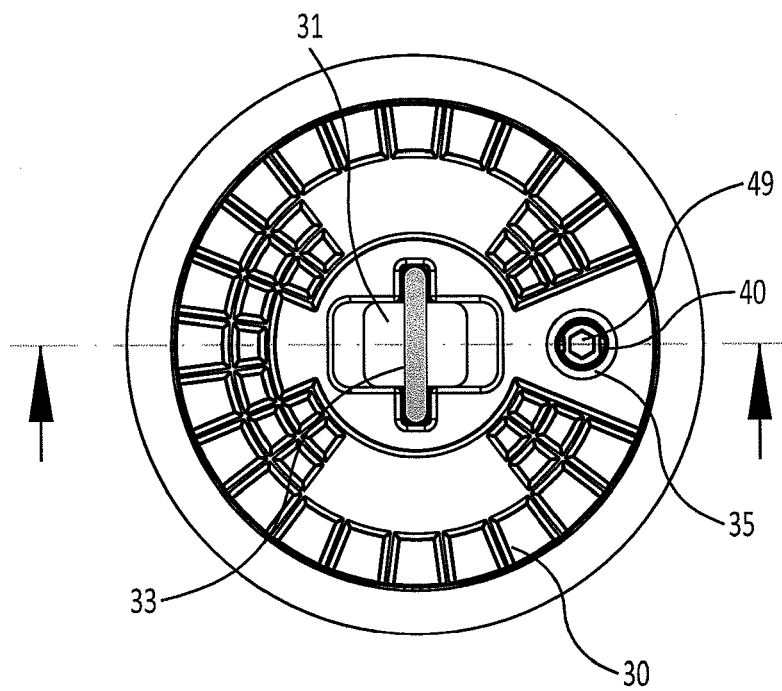


Fig.7

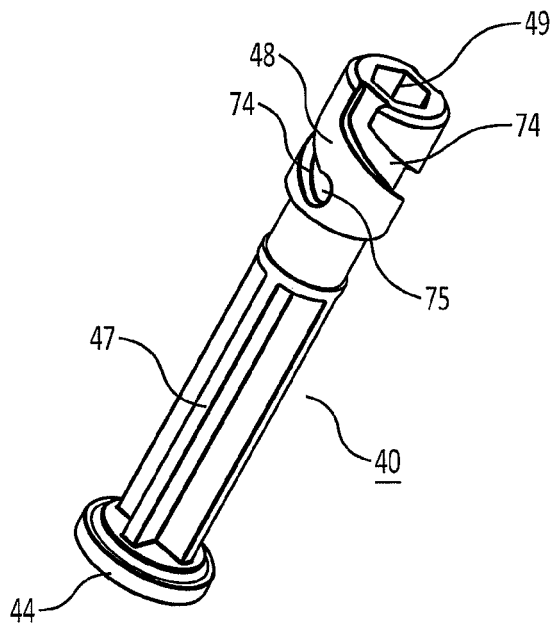


Fig. 8

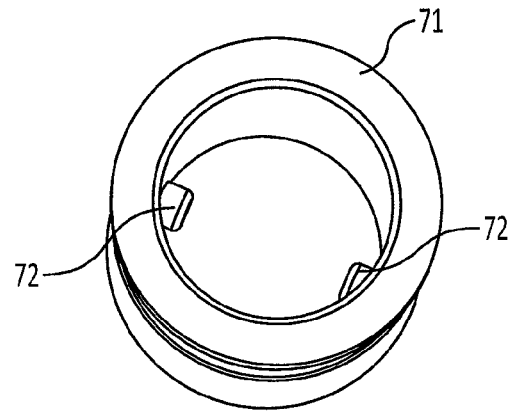


Fig. 9

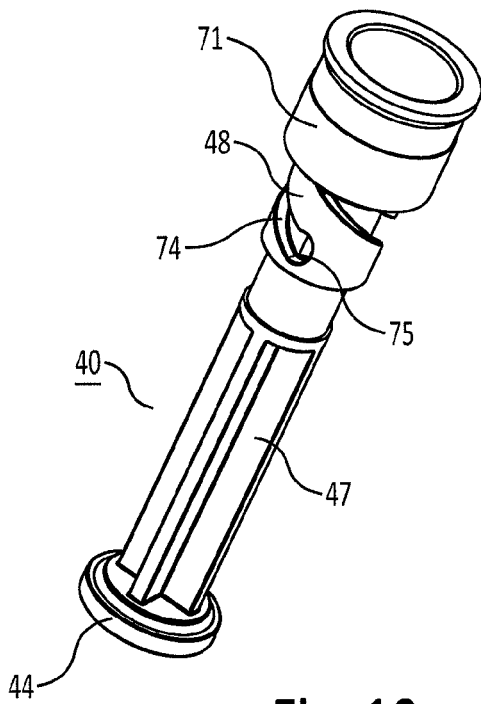


Fig. 10

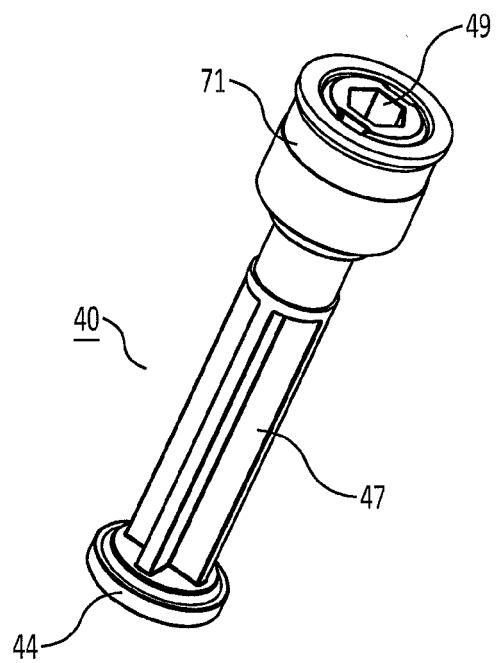


Fig. 11

REFERENCES CITED IN THE DESCRIPTION

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