Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).
We are surrounded by many rigid items of street furniture which can be unintentionally collided with, resulting in damage not only to the rigid items of street furniture but also to the object (e.g. a vehicle) or in injury to the person who collides with the item of street furniture. This invention relates to the field of item of street furniture and obstacles, particularly those items of street furniture and obstacles which are energy-absorbing and/or impact-resistant.

In the context of the invention the term "item of street furniture" covers, among other things, the following objects (the list is not exhaustive), all of which are either mounted on the ground or secured to a wall, namely:

- Poles or supports of traffic signs;
- Poles or supports of advertising boardings;
- Poles or supports of parking meters;
- Supports of sign boards or canopies;
- Protective posts which stand or are suspended in front of an object to be protected;
- Supports for conveyor belts;
- Supporting posts of guard rail structures or protective brackets;
- Posts for braking falling and/or rolling loads;
- Lamp posts;
- Poles or supports of traffic lights;
- and similar objects.

It is now known from a number of documents that such items of street furniture can be designed so that the consequences of minor collisions, contacts or gusts of wind can be limited. Indeed some items of street furniture bend completely so that the object or person which/who caused the collision is/are able to move over the item of street furniture. It is possible that such items of street furniture are energy-absorbing, but they are not impact-resistant in all cases.

However, the invention relates to an item of street furniture which on the one hand will limit this damage and/or injury in a collision/contact with both the item of street furniture and the colliding object or person in the case of minor collisions/contacts (this is the energy-absorbing part), whereupon the item of street furniture springs back into its normal position, whilst on the other hand the item of street furniture still performs a protective function from a defined degree of collision/contact, namely bringing the object or person who/which caused the collision/contact to a standstill (this is the impact-resistant part), without losing its resilient capacity.

The Belgian patent BE-A-1 013 952 (Wolters) already describes such an item of street furniture, namely an impact-resistant and energy-absorbing protective post, an energy-absorbing mechanism being located exclusively above-ground in a sprung pole, and consists of one or more rubber or elastomer disc elements which are compressed under the influence of the tilting movement of the post, caused by the colliding vehicle. This protective post consists of a large number of parts, is difficult to assemble and is expensive to acquire.

DE-U-201 20 311 discloses an item of street furniture comprising all technical features of the preamble of claim 1, and is located above ground level and consists of a post, a base plate and two elastic rings separated from each other. The base plate is provided not only with securing means to fasten the item to a foundation, but also with a tube arranged on the securing means, which tube encloses a hollow space in which both elastic rings are arranged. At the end of the tube, in the direction of the post, the tube is provided with an inwardly directed flange partially sealing the hollow space in the direction of the post, creating thereby an opening providing access to that hollow space. The underside of the post, in the direction of the base plate, is in the form of a flange and is arranged in the hollow space through said opening. The two elastic rings are in the hollow space separated from each other by that flange of the underside of the post. The post, the base plate and the elastic rings are arranged relative to one another in such a manner that at the beginning of a movement of the post relative to the base plate, from the normal position of the item, the elastic rings are able to absorb this first movement without damage to the parts of the item, and that when a defined limit value for the position of the post relative to the base plate is reached, direct contacts are established between the post on the one hand and retaining collars fixed on the base plate on the other, so that a further movement of the post relative to the base plate is no longer possible.

The object of the invention is now just to produce item of street furniture so simply that it can be manufactured from only a few parts and, in addition, is very easy to assemble and position, with the result that a repair - if necessary- can be carried out very easily and cheaply.

This object is achieved by an item of street furniture such as that defined in Claim 1. In such an item of street furniture the number of parts is limited to the absolute minimum and, in addition, it is assembled by simply sliding the post (3), the base plate (2) and the energy-absorbing element (4) into one another and by simply anchoring the base plate to an existing floor or to a wall. The simple sliding of these parts into one another is extremely simple because they are not fastened to one another, but only lie in contact with one another. In this connection it is pointed out that the terms "post" and "base plate", in the context of the invention, must be understood that they can be composed of different parts, parts which when in use form one unit, i.e. they are firmly connected to each other so that when in use no relative movement between these parts is possible.

The absence of parts of the item of street furniture below ground level prevents submersion or the seeping in of water and the associated corrosion. When maintaining or replacing the few parts the item of street furniture can be dismantled in situ with simple tools and parts can be replaced if necessary. The energy-absorbing element is
also located above ground in the item of street furniture in an easily accessible position. Therefore the manufacture and use of the item of street furniture are simple, whilst it can be manufactured and repaired at low cost. It is also important for the post (3) to be the impact-absorbing element, i.e. practically every point on the post (3), throughout its length, can be an active point of application for the external forces which act on the item of street furniture with full retention of the impact and absorbing properties. These external forces may be either a vehicle, a person, the wind or the like. The post may be the only impact-absorbing element, which means that part of the item of street furniture which can be moved by an object, a person or the wind, because the base plate is kept as low as possible, thus enabling a vehicle or a person to collide under normal circumstances only against the post and not against the base plate. The range of the energy absorption of the individual item of street furniture can easily be adapted to changing circumstances by adjusting the energy absorbing element in situ.

The action may take place in two steps, namely a spring action followed, if necessary, by a rigid action, as is also the case in the aforementioned state of the art, namely BE-A-1 013 952.

In the context of the invention the "normal position of the item of street furniture" is the position which the item of street furniture assumes when it is free and unloaded, i.e. without the influence of external forces, and a "rigid whole" is a unit of components or parts which can no longer move relative to one another, i.e. the post (3) and the base plate (2) may both be regarded as a rigid whole.

Claims 2 to 13 inclusive describe further embodiments of the item of street furniture.

In the context of the invention the terms "directed outwards" and "directed inwards" must be viewed from the centre of the item of street furniture, thus on the one hand from the centre viewed towards the outside, and on the other from outside to the centre.

Figures 1 to 13 inclusive describe different embodiments of the invention.

Figures 1 to 4 inclusive describe a first embodiment of an item of street furniture (1) according to the invention, consisting exclusively of a post (3) which is movably connected to a base plate (2), a further energy absorbing element (4) being fitted in the item of street furniture. These three components are not fastened to one another but simply slide into one another so that they only lie in contact with one another, as is clearly seen in Figures 2 and 3.

The base plate (2) is intended to be fastened to a base or the ground (existing flat ground surface 5 or a flat foundation adapted for this purpose), wall (18) or a supporting structure (23). In each case the item of street furniture is not worked into the ground or in the wall but is placed on top of it and secured to the ground or wall surface. The base plate (2) therefore consists of a wall or tube (6) which encloses a hollow space (17) and which is provided at its one end (7) with an inwardly directed flange or collar (8) which partially seals the hollow space (17) in the direction of the post, thereby creating an opening (16) which provides access to this hollow space (17) and which, at its other end (9), is provided with an outwardly directed fastening flange or collar (10), which is provided with bores (11) for fastening the base plate (2) to the ground or wall surface (5, 18) by means of screws or bolts. In this embodiment the wall or tube (6) is cylindrical in shape and the hollow space (17) is arranged centrally. It is clear that other shapes for the wall or tube (6) and other positions of the hollow space (17) in the wall or tube (6) are also suitable in the context of the invention. Although the cross-section of a tube is in most cases circular in shape, this cross-section may also be polygonal or have any other shape in the context of the invention. The choice of the shape of the wall which encloses the hollow space (17) is also completely free. This shape may, for example, be conical (see Figure 13), bent, spherical, hemi-spherical etc., in which case such shapes, in the direction of the post (3), may terminate in the opening (16) of the hollow space (17), that is without a separate flange or collar (8). In a preferred design, the flanges and collars are directed radially. The flanges or collars (15 and 8) interacting with one another may extend radially and outwardly or inwardly respectively. The length of the wall or tube (6) of the base plate (2) must be so small that practically all points of the post (3) may be an active point of application for the external forces which act on the item of street furniture, and not the base plate (2). It is also possible to arrange the opening (16) non-centrally, or to make it non-circular. For example, the opening (16) may have such a shape that the post (3), on impact, is guided in a direction other than the direction of impact (see Figure 12). This may be advantageous if the space which is available for the item of street furniture to avoid the impact is small. Because of the shape of the opening (16) a well-defined displacement of the post can be achieved, e.g. as a function of the distance to an object or area to be protected.

The base plate (2) may be both an assembly of different elements, such as, for example, tube sections, flanges etc. which together do form a rigid whole, and may be cast in one piece.

The post (3), in the embodiment shown, is cylindrical. All other shapes for the post are of course possible, and no limits are set with regard to the cross-section either, and the post may also be solid or hollow. This shape-independence provides the possibility of adapting the strength of the post to the conditions. The post (3) has, on its side facing the base plate (2), an outwardly directed flange or collar (15) which may also be arranged radially. When assembled, this flange or collar (15) is located in the hollow space (17) so that the post (3) projects through the opening (16), and this flange or collar (15) hooks on behind the inwardly directed flange or collar (8) of the base plate (2) because the outside diameter D of the flange or collar (15) is greater than the inside di-
The dimensions of these interacting flanges and collars (8 and 15) looking into one another (first direct contact between the post (3) and the base plate (2)) are such that there is not only sufficient clearance between the two parts, namely the flanges or collars of post (3) and base plate (2) to make possible a hinging movement between the post (3) and the base plate (2) inside the hollow space (17), but it is also such that after a defined limit value for the position of the post (3) relative to the foot (2) is reached, and after a relative movement of the post (3) and base plate (2) relative to one another, the post (3) comes into contact with the inner edge of the flange or collar (8) of the base plate (2), thereby creating a second direct contact between the post (3) and the base plate (2), and so that, as a result of the first and second direct contact, a rigid whole is formed by the post (3) and the base plate (2) and this whole can only be moved further as a unit under the influence of a collision/impact. For this purpose the shape of the inner edge of the flange or collar (8) can be adapted to the shape of the post (3) to obtain a better contact (second direct contact). The adaptation may be achieved by bevelling the flange or collar (8).

An energy absorbing element (4) is provided in the hollow space (17) and is arranged in this hollow space (17) so that, when assembled, the post (3) and the base plate (2) always press against one another in order to bring and maintain the item of street furniture in the normal position, i.e. the energy absorbing element has a resilience, the absorbed energy being re-released when the external forces disappear. Because of this pressing against one another a first direct contact is established between the post (3) and the base plate (2). The energy absorbing element (4) is in this embodiment positioned between the post (3) on the one hand and the ground or floor surface (5) to which the base plate (2) is secured on the other. Alternatively, the base plate (2) can be provided with a bottom plate (19) which seals the hollow space (17) in the base plate (2) at the bottom (see Figure 9). This bottom plate (19) must be releasably connected to the rest of the base plate (2) to enable the post (3) to be inserted through the opening (16) when the item of street furniture is assembled. The post (3) may lie with its underside directly against the energy absorbing element (4). The energy absorbing element (4) can be assembled in different ways and can have all kinds of shapes. For example, it may be a homogeneous block manufactured from one rubber or another, elastomer or any other material with resilient and/or damping properties, or it may be constructed in different layers of elastic material with varying elasticity and/or damping properties. In certain cases it may be interesting to use an elastic material (4) which is elastically deformable, but incompressible or hardly compressible, so that during the deformation under an impact only the shape of the elastic material is changed, whilst its volume remains un-
The item of street furniture being broken. Of course the post (3) and the base plate (2) will move relative to one another as a result of the compression and deformation of the energy absorbing element (4). This relative movement between the post (3) and the base plate (2) is made impossible once a defined limit value for the position of the post (3) relative to the base plate (2) is reached. At that moment the post (3) lies with its outside against the inner edge of the flange or collar (8) of the base plate (2), thereby creating a second direct contact between the post (3) and the base plate (2). Because the energy absorbing element (4) always attempts to press the flange or collar (15) of the post (3) against the flange or collar (8) of the base plate (first direct contact), and because, as a result of the impact, the post (3) tilts so that at a certain time it comes into contact, on its outside, with the flange or collar (8) of the base plate (2) (second direct contact), we have a rigid whole because firstly the flanges (8 and 15) have a contact pivot with one another (first direct contact), and because secondly a contact (second direct contact) is established between the outside of the post (3) and the inner edge of the flange or collar (8) of the base plate (2). This contact pivot (first direct contact) and that contact (second direct contact) together prevent further movement of the post (3) relative to the base plate (2). Such a condition is represented in Figure 4. One advantage of this rigid whole is that the energy absorbing element (4) cannot be deformed further and no plastic destruction takes place, as otherwise the resilience of the energy absorbing element (4) would be lost. The energy absorbing element (4) in the hollow space in the base plate (2) therefore forms, in fact, a type of hinge with a damping action, wherein, when a force is exerted transversely to the item of street furniture, the energy absorbing element (4) is deformed in such a manner that the post (3) undergoes from this hinge an angular distortion relative to the unloaded condition until a defined limit value is reached. It is clear that when the energy absorbing element (4) consists of less compressible materials, more force will be required to obtain deformation, so that such materials should preferably be used in applications where the impact may be great or the movement between the post (3) and the base plate (2) is to be considerably limited. Conversely in the case of easily compressible materials (4) it will require relatively little force to obtain deformation of the energy absorbing element (4), so that the so-called defined limit value for the position of the post (3) relative to the base plate (2) is reached very quickly.

A further advantage of the item of street furniture according to the invention is that the energy absorbing element (4) is enclosed in the hollow space (17), thereby protecting it from weather conditions so that it is not greatly subject to weathering and/or degeneration, which means that its energy absorbing capacity, as well as its resilience, are not lost.

In the example shown, the item of street furniture is constructed symmetrically so that the behaviour of the item of street furniture is always the same in the event of a collision from any direction. According to the invention, of course, this need not always be the case, and the material of the energy absorbing element (4) could be different in a certain direction from the material used in another direction in order to ensure that the item of street furniture behaves differently in different directions.

The item of street furniture according to the invention has a very simple structure since it consists only of a post (3), a base plate (2) and an energy absorbing element (4). It can therefore be manufactured and repaired very inexpensively and is therefore suitable for all kinds of applications. The assembly of the item of street furniture is also extremely simple since the three parts are not fastened to one another but simply lie against one another. In fact, the three parts are simply slid into one another. Because there is a mechanical limitation, because of the first and second direct contact, which emerges into a rigid whole of the post (3) and base plate (2), the degree of deformation of the energy absorbing element is limited, of course, below the maximum permissible degree of deformation of the energy absorbing element (4). As a result of this the energy absorbing element (4) always has the same action and does not lose its resilience.

Figures 5 and 6 show a further embodiment of an item of street furniture according to the invention, wherein the item of street furniture is fastened by means of its base plate (2) to a wall (18). This embodiment is very suitable, for example, for use as a support beam of a porch, e.g. by ensuring that the item of street furniture begins to move before the bending load of the supporting beam of the porch is reached. This may prevent, for example, the supporting beam from suddenly buckling under a heavy load, e.g. a snow load.

Figures 7 and 8 show that the post (3) may assume all kinds of shapes. Other shapes are not excluded, of course, and other cross-sections are possible.

Figure 9 shows that the base plate (2) is provided with a bottom plate (19) which is secured to the fastening flange or collar (10).

If the item of street furniture has to be mounted in solid ground a foundation or supporting structure (23) must be provided to which the item of street furniture can be secured above ground. The foundation or supporting structure must be anchored in the ground (see Figure 10).

Figure 11 shows an energy absorbing element (4) with a centring ring (20) and with a disc-shaped part (21) which interacts with a groove (22) on the inner surface of the wall or tube (6) of the base plate (2). The position of the centring ring (20) and the disc-shaped section (21) on the energy absorbing element (4) may be freely selected. It will be clear that it is even sufficient to have, instead of a centring ring (20), a plurality of centring elements which are arranged on the energy absorbing element (4) in order to centre the energy absorbing element (4) in the hollow space (17). In the embodiments shown in Figures 5 to 10, centring elements or one or more centring rings
The item of street furniture may be used not only in the technical fields indicated in the preamble of the description but may also be used, for example, in locations with slow traffic, such as in car parks and in shopping centres, to protect machines and installations, for all kinds of internal and external transport equipment, and even for protecting against vandalism, due to its blocking function.

The invention is by no means limited to the items of street furniture described as examples and shown in the figures, but items of street furniture according to the invention may also be realised in many different ways.

Claims

1. An item of street furniture which is located exclusively above ground level wherein the item of street furniture consists exclusively of a post (3), a base plate (2) and an energy absorbing element (4); wherein only the base plate (2) is provided with securing means (10, 11) to fasten the item of street furniture directly to an existing ground surface (5), to a foundation adapted for this purpose, to a wall (18) or to a supporting structure (23); wherein the base plate (2) is also provided with a wall or tube (6) arranged on the securing means (10, 11), which wall or tube (6) encloses a hollow space (17) in which the energy absorbing element (4) is arranged and which is partially sealed in the direction of the post (3), creating thereby an opening (16) providing access to this hollow space (17); wherein the underside (15) of the post (3), in the direction of the base plate (2), is arranged in the hollow space (17) through said opening (16); and wherein the post (3), the base plate (2) and the energy absorbing element (4) are arranged relative to one another in such a manner that at the beginning of a movement of the post (3) relative to the base plate (2), from a normal position of the item of street furniture, the energy absorbing element (4) is able to absorb this first movement without damage to the parts of the item of street furniture, characterized in that:

either one end (7) of the wall or tube (6) is provided with an inwardly directed flange or collar (8) partially sealing the hollow space (17) in the direction of the post (3), creating thereby said opening (16), or one end of the wall (6), which shape is completely free and may be conical, bent, spherical, hemi-spherical, etc., in which case said end of the wall (6), in the direction of the post (3), may, terminate in said opening (16) of the hollow space (17), that is without a separate flange or collar (8), and wherein either the edge of the flange or collar (8), or the edge of the wall (6) terminating in the opening (16), is used to create with the post a second direct contact, when the post is tilted and reaches a defined limit value for its position; wherein the energy absorbing element (4), located in the hollow space (17), is arranged between and remains in direct contact at all times with the underside (15) of the post (3) on the one hand and with the ground surface (5), the foundation, the wall (18), the supporting structure (23) or a bottom plate (19) of the base plate (2) on the other, so that the post (3) and the base plate (2), are both pressed together at all times, thereby creating a first direct contact between the post (3) and the base plate (2), as a result of which the item of street furniture is brought and maintained in the normal position, i.e. the energy absorbing element (4) releases the absorbed energy when the external forces (F) disappear, and that when a defined limit value for the position of the post (3) relative to the base plate (2) is reached, a second direct contact is established between the post (3) on the one hand and either the inner edge of said inwardly directed flange or collar (8), or the inner edge of said wall (6) terminating in said opening (16) on the other, and a further movement of the post (3) relative to the base plate (2) is no longer possible because, with further movement of the post (3) from this defined position, a rigid whole is formed consisting of the post (3) and the base plate (2) by means of the first and second direct contact between the post (3) and the base plate (2), as a result of which the energy absorbing element (4) is not additionally loaded.

2. The item of street furniture according to claim 1, characterized in that the post (3), the base plate (2) and the energy absorbing element (4), when in use, are simply slid into one another so that they only lie against one another without being fastened to one another.

3. The item of street furniture according to any one of the preceding claims, characterized in that the securing means of the base plate (2) consist of an outwardly directed fastening flange or collar (10) which is provided with borings (11).

4. The item of street furniture according to any one of claim 3, characterized in that the wall or tube (6) is connected to the inner edge of the fastening flange or collar (10).

5. The item of street furniture according to claim 4, characterized in that the hollow space (17) is ar-
ranged centrally in the wall or tube (6).

6. The item of street furniture according to claim 4, characterised in that the wall or tube (6) is cylindrical.

7. The item of street furniture according to claim 1, characterised in that the opening (16) is shaped so that during the movement of the post (3) relative to the base plate (2) the post (3) is forced in a direction other than in the direction of the exerted force (F).

8. The item of street furniture according to claim 1, characterised in that a part (20) of the energy absorbing element (4) is provided for centring the energy absorbing element (4) in the hollow space (17).

9. The item of street furniture according to any one of the preceding claims, characterised in that the underside of the post (3) terminates laterally in an outwardly directed flange or collar (15).

10. The item of street furniture according to claim 9, characterised in that the energy absorbing element (4), in the normal position of the item of street furniture, presses the outwardly directed flange or collar (15) of the post (3) against the inwardly directed flange or collar (8) of the base plate (2) in order to maintain the item of street furniture in its normal position.

11. The item of street furniture according to claim 1, characterised in that the energy absorbing element (4) is shaped so that from the beginning of the movement of the post (3) relative to the base plate (2) until the defined limit value for the position of the post (3) relative to the base plate (2) is reached, a deformation of the energy absorbing element (4) is possible in the hollow space (17).

12. The item of street furniture according to any one of the preceding claims, characterised in that the energy absorbing element (4) is arranged relative to the post (3) and the base plate (2) so that in the normal position of the item of street furniture the energy absorbing element (4), in addition to the function of pressing the post (3) and base plate (2) against one another, causes an additional resistance which can delay the beginning of the movement of the post (3) relative to the base plate (2) when the item of street furniture is loaded.

13. The item of street furniture according to claim 12, characterised in that the energy absorbing element (4) is provided with the additional resistance because a part of the energy absorbing element (4) is received, in the normal position of the item of street furniture, in a groove (22) on the inner surface of the wall or tube (6) of the base plate (2).

Patentansprüche

1. Gegenstand eines Straßenmobiliars, der sich ausschließlich über Bodenniveau befindet, wobei der Gegenstand eines Straßenmobiliars ausschließlich aus einer Stange (3), einer Grundplatte (2) und einem Energieabsorptionselement (4) besteht; wobei nur die Grundplatte (2) mit einem Sicherungsmittel (10, 11) zur Befestigung des Gegenstandes eines Straßenmobiliars direkt an der vorhandenen Bodenfläche (5), an einem für diesen Zweck ausgebildeten Fundament, an einer Wand (18) oder an einer Trägerstruktur (23) versehen ist; wobei die Grundplatte (2) auch mit einer Wand oder einem Rohr (6) versehen ist, die bzw. das auf dem Sicherungsmittel (10, 11) angeordnet ist, wobei die Wand oder das Rohr (6) einen Hohlraum (17) umschließt, in dem das Energieabsorptionselement (4) angeordnet ist und der teilweise in die Richtung der Stange (3) abgedichtet ist, wodurch eine Öffnung (16) erzeugt wird, die einen Zugang zu diesem Hohlraum (17) bereitstellt; wobei die Untereite (15) der Stange (3) in der Richtung der Grundplatte (2) in dem Hohlraum (17) durch die Öffnung (16) angeordnet ist; und wobei die Stange (3), die Grundplatte (2) und das Energieabsorptionselement (4) relativ zueinander derart angeordnet sind, dass zu Beginn einer Bewegung der Stange (3) relativ zur Grundplatte (2) aus einer normalen Position des Gegenstandes eines Straßenmobiliars das Energieabsorptionselement (4) instande ist, diese erste Bewegung ohne Beschädigungen an den Teilen des Gegenstandes eines Straßenmobiliars zu absorbieren; dadurch gekennzeichnet, dass:

entweder ein Ende (7) der Wand oder des Rohres (6) mit einem nach innen gerichteten Flansch oder Kranz (8) versehen ist, der den Hohlraum (17) in die Richtung der Stange (3) abdichtet, wodurch die Öffnung (16) gebildet wird, oder ein Ende der Wand (6) eine vollständig freie Form aufweist und konisch, gebogen, sphärisch, hemisphärisch usw. sein kann, wobei in diesem Fall das Ende der Wand (6) in der Richtung der Stange (3) in der Öffnung (16) des Hohlraumes (17) enden kann, der keinen separaten Flansch oder Kranz (8) aufweist; und wobei entweder der Rand des Flansches oder Kranzes (8) oder der Rand der Wand (6), die in der Öffnung (16) endet, zur Bildung eines zweiten direkten Kontaktes mit der Stange verwendet wird, wenn die Stange geneigt wird und einen bestimmten Grenzwert für ihre Position erreicht;
wobei das Energieabsorptionselement (4), das sich im Rohr (17) befindet, zwischen der Unterseite (15) der Stange (3) einerseits und der Bodenfläche (5), dem Fundament, der Wand (18), der Trägerstruktur (23) oder einer Bodenplatte (19) der Grundplatte (2) andererseits angeordnet ist und jederzeit in direktem Kontakt mit diesen bleibt, so dass die Stange (3) und die Grundplatte (2) beide jederzeit zusammengepreßt werden, wodurch ein erster direkter Kontakt zwischen der Stange (2) und der Grundplatte (2) erzeugt wird, infolgedessen der Gegenstand eines Straßenmobiliars in die normale Position gebracht und in dieser gehalten wird, d.h., das Energieabsorptionselement (4) setzt die absorbierte Energie frei, wenn die äußeren Kräfte (F) verschwinden, und dass, wenn ein bestimmter Grenzwert für die Position der Stange (3) relativ zur Grundplatte (2) erreicht ist, ein zweiter direkter Kontakt zwischen der Stange (3) einerseits und entweder dem inneren Rand des nach innen gerichteten Flansches oder Kranzes (8) oder dem inneren Rand der Wand (6), die in der Öffnung (16) endet, andererseits hergestellt wird und eine weitere Bewegung der Stange (3) relativ zur Grundplatte (2) nicht mehr möglich ist, da bei einer weiteren Bewegung der Stange (3) aus dieser bestimmten Position mit Hilfe des ersten und zweiten direkten Kontakts zwischen der Stange (3) und der Grundplatte (2) ein starrer Ganzes gebildet wird, das aus der Stange (3) und der Grundplatte (2) besteht, wodurch das Energieabsorptionselement (4) nicht zusätzlich belastet wird.

2. Gegenstand eines Straßenmobiliars nach Anspruch 1, **dadurch gekennzeichnet, dass** die Stange (3) und die Grundplatte (2) und das Energieabsorptionselement (4) in Gebrauch einfach ineinander geschoben werden, so dass sie nur gegeneinander liegen, ohne aneinander befestigt zu sein.

3. Gegenstand eines Straßenmobiliars nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das Sicherungsmittel der Grundplatte (2) aus einem nach außen gerichteten Befestigungsflansch oder -kranz (10) besteht, der mit Bohrungen (11) versehen ist.

4. Gegenstand eines Straßenmobiliars nach Anspruch 3, **dadurch gekennzeichnet, dass** die Wand oder das Rohr (6) mit dem inneren Rand des Befestigungsflansches oder -kranges (10) verbunden ist.

5. Gegenstand eines Straßenmobiliars nach Anspruch 4, **dadurch gekennzeichnet, dass** der Hohlraum (17) zentral in der Wand oder in dem Rohr (6) angeordnet ist.

6. Gegenstand eines Straßenmobiliars nach Anspruch 4, **dadurch gekennzeichnet, dass** die Wand oder das Rohr (6) zylindrisch ist.

7. gemäß dem erteilten Anspruch nach Anspruch 1, **dadurch gekennzeichnet, dass** die Öffnung (16) so geformt ist, dass die Stange (3) während der Bewegung der Stange (3) relativ zur Grundplatte (2) in eine Richtung gepresst wird, die nicht die Richtung der ausgeübten Kraft (F) ist.

8. Gegenstand eines Straßenmobiliars nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Teil (20) des Energieabsorptionselement (4) zum Zentrieren des Energieabsorptionselementes in dem Hohlraum (17) vorgesehen ist.

9. Gegenstand eines Straßenmobiliars nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Unterseite der Stange (3) seitlich in einem nach außen gerichteten Flansch oder Kranz (15) endet.

10. Gegenstand eines Straßenmobiliars nach Anspruch 9, **dadurch gekennzeichnet, dass** das Energieabsorptionselement (4) in der normalen Position des Gegenstandes eines Straßenmobiliars den nach außen gerichteten Flansch oder Kranz (15) der Stange (3) gegen den nach innen gerichteten Flansch oder Kranz (8) der Grundplatte (2) preßt, um den Gegenstand eines Straßenmobiliars in seiner normalen Position zu halten.

11. Gegenstand eines Straßenmobiliars nach Anspruch 1, **dadurch gekennzeichnet, dass** das Energieabsorptionselement (4) so geformt ist, dass vom Beginn der Bewegung der Stange (3) relativ zur Grundplatte (2) bis zum Erreichen des bestimmten Grenzwertes für die Position der Stange (3) relativ zur Grundplatte (2) eine Verformung des Energieabsorptionselementes (4) in dem Hohlraum (17) möglich ist.

12. Gegenstand eines Straßenmobiliars nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das Energieabsorptionselement (4) relativ zu der Stange (3) und der Grundplatte (2) so angeordnet ist, dass das Energieabsorptionselement (4) in der normalen Position des Gegenstandes eines Straßenmobiliars zusätzlich zu der Funktion zum Zusammenpressen der Stange (3) und der Grundplatte (2) einen zusätzlichen Widerstand versucht, der den Beginn der Bewegung der Stange (3) relativ zur Grundplatte (2) verzögert kann, wenn der Gegenstand eines Straßenmobiliars geladen wird.

Revendications

1. Élément de mobilier urbain qui est situé exclusivement au-dessus du niveau du sol, dans lequel l’élément de mobilier urbain consiste exclusivement en un poteau (3), une embase (2) et un élément absorbant l’énergie (4) ; dans lequel seule l’embase (2) est munie de moyens de fixation (10, 11) pour attacher l’élément de mobilier urbain directement à une surface de sol existante (5), à une base conçue à cette fin, à une paroi (18) ou à une structure de support (23) ; dans lequel l’embase (2) est également munie d’une paroi ou d’un tube (6) agencé sur les moyens de fixation (10, 11), laquelle paroi ou lequel tube (6) délimite un espace creux (17) dans lequel l’élément absorbant l’énergie (4) est agencé et qui est partiellement scellé dans la direction du poteau (3), créant de ce fait une ouverture (16) donnant accès à cet espace creux (17) ; dans lequel le dessous (15) du poteau (3), dans la direction de l’embase (2), est agencé dans l’espace creux (17) à travers ladite ouverture (16) ; et dans lequel le poteau (3), l’embase (2) et l’élément absorbant l’énergie (4) sont agencés les uns par rapport aux autres de sorte qu’au début d’un mouvement du poteau (3) par rapport à l’embase (2), à partir d’une position normale de l’élément de mobilier urbain, l’élément absorbant l’énergie (4) est susceptible d’absorber ce premier mouvement sans dégâts aux parties de l’élément de mobilier urbain ; caractérisé en ce que :
l’une ou l’autre extrémité (7) de la paroi ou du tube (6) est munie d’une bride ou d’un collier (8) dirigé vers l’intérieur scellant partiellement l’espace creux (17) dans la direction du poteau (3), créant de ce fait ladite ouverture (16), ou une extrémité particulière de la paroi (6), laquelle forme est complètement libre et peut être conique, courbée, sphérique, hémisphérique, etc., auquel cas ladite extrémité de la paroi (6), dans la direction du poteau (3), peut se terminer dans ladite ouverture (16) de l’espace creux (17), qui est sans bride ou collier (8) distinct, et dans lequel l’un ou l’autre du bord de la bride ou du collier (8), ou du bord de la paroi (6) se terminant dans l’ouverture (16), est utilisé pour créer avec le poteau un second contact direct, quand le poteau est incliné et atteint une valeur limite définie pour sa position ; dans lequel l’élément absorbant l’énergie (4), situé dans l’espace creux (17), est agencé entre et reste en contact direct à tout instant avec le dessous (15) du poteau (3) d’une part et avec la surface de sol (5), la base, la paroi (18), la structure de support (23) ou une plaque de fond (19) de l’embase (2) d’autre part, de sorte que le poteau (3) et l’embase (2) sont tous les deux pressés ensemble à tout instant, créant de ce fait un premier contact direct entre le poteau (3) et l’embase (2), suite à quoi l’élément de mobilier urbain est amené et maintenu dans la position normale, c’est-à-dire que l’élément absorbant l’énergie (4) libère l’énergie absorbée lorsque les forces externes (F) disparaissent, et en ce qu’une valeur limite définie pour la position du poteau (3) par rapport à l’embase (2) est atteinte, un second contact direct est établi entre le poteau (3) d’une part et l’un ou l’autre du bord intérieur de ladite bride ou dudit collier (8) dirigé vers l’intérieur, ou le bord intérieur de ladite paroi (6) se terminant dans ladite ouverture (16) d’autre part, et un mouvement supplémentaire du poteau (3) par rapport à l’embase (2) n’est plus possible parce que, avec un mouvement supplémentaire du poteau (3) à partir de cette position définie, un ensemble rigide est formé constitué par le poteau (3) et l’embase (2) au moyen du premier et du second contact direct entre le poteau (3) et l’embase (2), suite à quoi l’élément absorbant l’énergie (4) ne subit pas de charge supplémentaire.

2. Élément de mobilier urbain selon la revendication 1, caractérisé en ce que le poteau (3), l’embase (2) et l’élément absorbant l’énergie (4), en cours d’utilisation, sont simplement coulissés les uns dans les autres de sorte qu’ils reposent seulement les uns contre les autres sans être attachés les uns aux autres.

3. Élément de mobilier urbain selon l’une quelconque des revendications précédentes, caractérisé en ce que les moyens de fixation de l’embase (2) consistent en une bride ou un collier de fixation (10) dirigé vers l’extérieur qui est muni d’alésages (11).

4. Élément de mobilier urbain selon la revendication 3, caractérisé en ce que la paroi ou le tube (6) est relié au bord intérieur de la bride ou du collier de fixation (10).

5. Élément de mobilier urbain selon la revendication 4,
caractérisé en ce que l'espace creux (17) est agencé au centre dans la paroi ou le tube (6).

6. Élément de mobilier urbain selon la revendication 4, caractérisé en ce que la paroi ou le tube (6) est cylindrique.

7. Élément de mobilier urbain selon la revendication 1, caractérisé en ce que l'ouverture (16) est mise en forme de sorte que pendant le mouvement du poteau (3) par rapport à l'embase (2), le poteau (3) est forcé dans une direction autre que dans la direction de la force exercée (F).

8. Élément de mobilier urbain selon la revendication 1, caractérisé en ce qu'une partie (20) de l'élément absorbant l'énergie (4) est prévue pour centrer l'élément absorbant l'énergie (4) dans l'espace creux (17).

9. Élément de mobilier urbain selon l'une quelconque des revendications précédentes, caractérisé en ce que le dessous du poteau (3) se termine latéralement en une bride ou un collier (15) dirigé vers l'extérieur.

10. Élément de mobilier urbain selon la revendication 9, caractérisé en ce que l'élément absorbant l'énergie (4), dans la position normale de l'élément de mobilier urbain, presse la bride ou le collier (15), dirigé vers l'extérieur, du poteau (3) contre la bride ou le collier (8), dirigé vers l'intérieur, de l'embase (2) afin de maintenir l'élément de mobilier urbain dans sa position normale.

11. Élément de mobilier urbain selon la revendication 1, caractérisé en ce que l'élément absorbant l'énergie (4) est formé de sorte qu'à partir du début du mouvement du poteau (3) par rapport à l'embase (2) jusqu'à ce que la valeur limite définie pour la position du poteau (3) par rapport à l'embase (2) soit atteinte, une déformation de l'élément absorbant l'énergie (4) est possible dans l'espace creux (17).

12. Élément de mobilier urbain selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément absorbant l'énergie (4) est agencé par rapport au poteau (3) et à l'embase (2) de sorte que dans la position normale de l'élément de mobilier urbain, l'élément absorbant l'énergie (4), en plus de la fonction de presser le poteau (3) et l'embase (2) l'un contre l'autre, amène une résistance supplémentaire qui peut retarder le début du mouvement du poteau (3) par rapport à l'embase (2) lorsque l'élément de mobilier urbain subit une charge.

13. Élément de mobilier urbain selon la revendication 12, caractérisé en ce que l'élément absorbant l'énergie (4) est muni de la résistance supplémentaire parce qu'une partie de l'élément absorbant l'énergie (4) est reçue, dans la position normale de l'élément de mobilier urbain, dans une rainure (22) sur la surface intérieure de la paroi ou du tube (6) de l'embase (2).
REFERENCES CITED IN THE DESCRIPTION

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