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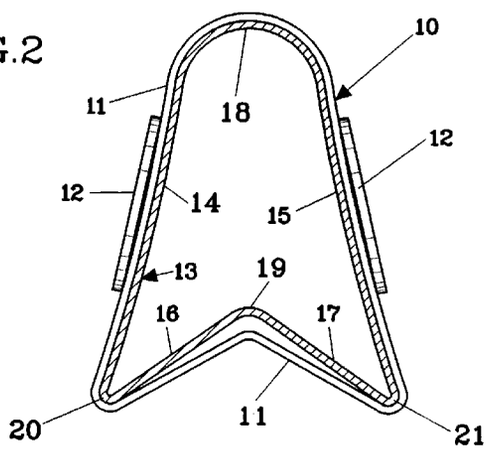
(54) Self restoring pole.

(57) Pole (10) or part of pole for marking road curbs and of the type which after collision is self restoring and which consists of a profile tubular profile with a closed hollow cross section, shaped as an isosceles triangle with sides (14, 15) and base. The hollow profile of the pole is constituted by a homogenous, unbroken limiting wall (13). The base includes two essentially equally long, straight wall portions (16, 17), which meet each other at an angle which is larger than the angle between both sides (14, 15).

FIG.2



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The present invention refers to a pole or part of a pole for marking road curbs, which pole after collision is self restoring and consists of a tubular profile with a closed hollow cross section, designed as an isosceles triangle with sides and a base.

Background of the invention

Poles supporting reflectors or other road signs by the curb of roads are means to enhance the traffic security and improve the visual guidance, especially at night driving.

Poles manufactured in plastic materials with a tubular closed cross section has poor elastic properties and by collision get consisting bending damages and fractural impressions, unless the pole breaks off completely.

Experiments have been done by means of springs, hinges or the like devices at the root of the pole, to give the pole self restoring characteristics, but this entails high manufacturing-and mounting costs, as well as doubtful practical characteristics at collision by normal velocity.

Authorities in different countries have drawn up standards for how a curb pole should be designed, and worked out recommendations regarding the positioning of the poles, such as the distances between them, etc. According to certain standards the pole i.a. should consist of a hollow closed cross section profile, usually with triangular form. According to the standards a verge pole for example should have a lifespan of between five and ten years and be able to withstand various stresses which are caused by the wind, by cleaning equipment and by snow that has been ploughed towards the curbe of a road.

US-A-4596489 discloses a road marking pole which is manufactured as a plastic profile which makes it self restoring after bending. This known pole has a mainly rectangular cross-section with two broad long sides. The shape and the fact that the pole is provided with a number of longitudinal relief grooves at points of deformation, renders it a low bending stiffness and therefore it bends with a radious along a rather long section. This leads to the pole being influenced even by moderate gusts and can be bent downwards out of sight, when it is hit by ploughed snow.

The purpose with the invention and important features

The purpose of the present invention is to provide a pole consisting of a hollow profile which is closed in cross section, which is rigid at bending and which does not bend down until exceeding a predetermined transversal force, for example by collision and stands bending approximately 90 degrees repeated times without permanent deformations. The pole shall be able to be manufactured with simple and cheap manufacturing methods, for example by extruding of an impact resistant plastic material.

These tasks has been solved by the hollow profile being constituted by a homogenous, unbroken limiting wall, and that the base includes two essentially equally long, straight wall sections, which meet each other at an angle which is larger than the angle between the two sides.

Specification of the drawings

An embodiment of the invention now will be described with reference to the enclosed drawings, in which

Fig. 1 shows an embodiment of the pole according to the invention in a lateral view,

Fig. 2 is a section along the line II-II in Fig. 1,

Fig. 3 is a section through the deformed folding section of a pole which has been run down according to Fig. 1-2,

Fig. 4 is a lateral view of the folding section of a conventional round pole, and

Fig. 5 shows in a corresponding way the folding section of a pole designed according to the invention.

Description of prefered embodiments

Fig. 1 shows a first embodiment of a pole 10 according to the invention, as to its external appearance very little differs from road marking poles according to for example German standards. The pole 10 is provided with a day mark 11 which also carries reflecting devices 12, which are shaped with a rectangular and two circular areas respectively depending on which side of the pole 10 being directed against the driving direction.

The pole 10 shown in Fig. 1 is constituted by a closed hollow profile, shown in Fig. 2, with a homogenous, unbroken limiting wall 13 which lacks both inner stiffening means and longitudinal relief grooves. This wall 13 includes four essentially straight wall portions 14-17, of which the two first-mentioned are approximately twice as long as the latter. The cross-section profile of the poles can be surrounded by an isosceles triangle with rounded corners, where the height is bigger than the base.

The two longer wall sections 14, 15 in the cross section of the pole is connected by means of a circular arc section 18 which fixes said wall portions at a certain angle. The two shorter wall sections 16, 17 are mutually connected via a blunt angle section 19 which has a considerably smaller extension than the arc section 18. An angle between the wall sections 14, 15 is considerably smaller than an angle between the wall sections 16, 17. These are connected to the longer wall sections 14, 15 via acute angle sections 20, 21.

The arc shaped portion 18 has a larger radius than the rest of the interconnection portions 19-21 between the straight wall portions 14-17.

The straight wall portions of the pole and the angles and the radii between these accomplish that the hollow profile can be pressed together, such as illustrated by fig. 3. In this condition the pole can be folded to one or the other side, without need for any appreciable force to be applied. The triangular shape of the pole thus makes it initially stiff, but after compressing to the state shown in Fig. 3, the pole is yielding versus transversal load. Through cooperation of the arc section 18 and the angle sections 19-21 the pole strives to restore itself to its original hollow form, which means that the pole immediately again is straightened up.

In Fig. 4 is illustrated how a known pole with closed hole profile is permanently deformed. The wall portions of the pole, which are situated in the length direction of the road, constitutes the web of the profile, therefore provides a big moment of inertia, which at the folding of the pole is crumpled together, which means that the pole becomes permanently deformed.

Fig. 5 shows corresponding folding section for the pole according to the invention according to fig. 1 - 3. As is illustrated by Fig. 5 the folding is controlled, without crumpling together the wall portions, so that the pole after the folding again can be restored. From fig. 5 it can be seen that the folding of the pole occurs locally on a very short part of its length.

Fig. 2 illustrates that the day mark 11 is shaped as a sleeve with the same hollow profile as that of the pole, but with slightly larger measure. The sleeve can be widened by flattening out the angle between both shorter wall sections, whereupon the sleeve can be slided onto the pole and be displaced along this to correct position. When the angle between both shorter wall sections again is allowed to spring back a clamp joint is obtained between the sleeve and pole. The sleeve can finally be fixed to the pole by means of screws for attachment of the reflectors 12.

The pole according to the invention preferably can be manufactured through extruding or injection moulding of an impact resistant, UV-stabilized polypropene plastic material, which can be recycled.

The invention is not limited to the above shown embodiment, but several variants are conceivable within the scope of the following claims. For example the arc section 18 can be flattened.

Claims

1. Pole (10) or part of pole for marking road curbs and of the type which after collision is self restoring and which consists of a profile tubular profile with a closed hollow cross section, shaped as an isosceles triangle with sides (14, 15) and a base, **characterized therein,**
that the hollow profile of the pole is constituted by a homogenous, unbroken limiting wall (13), and that the base includes two essentially equally long, straight wall portions (16, 17), which meet each other at an angle which is larger than the angle between both sides (14, 15).

2. Pole according to claim 1, **characterized therein,**
that both sides (14, 15) meet each other in an arc shaped wall section (18).

3. Pole according to claim 1 or 2, **characterized therein,**
that the arc shaped wall section (18) has a larger radius than the radius between the respective wall portion (16, 17) and the respective side (14, 15).

4. Pole according to any of preceding claims, **characterized therein,**
that the hollow profile includes four essentially flat portions (14-17) and four angle points (18-21), one (19) of which is directed towards the interior of the hollow profile and forms the largest angle.

FIG.1

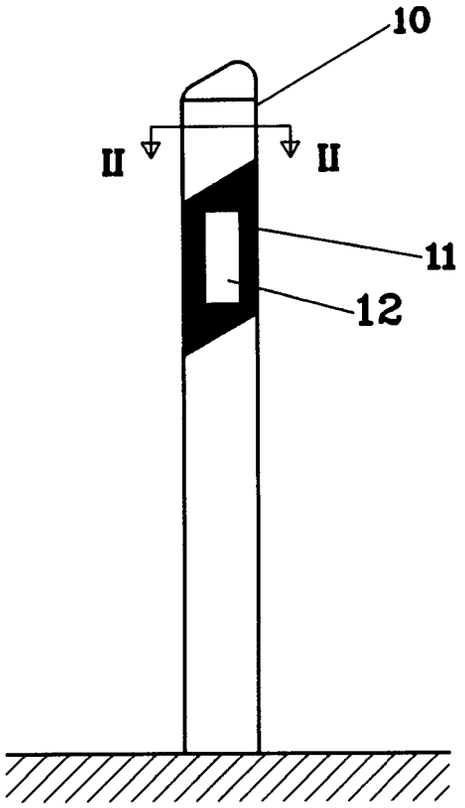


FIG.4

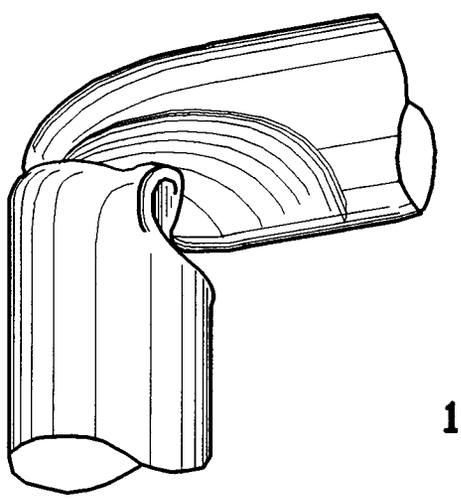


FIG.5

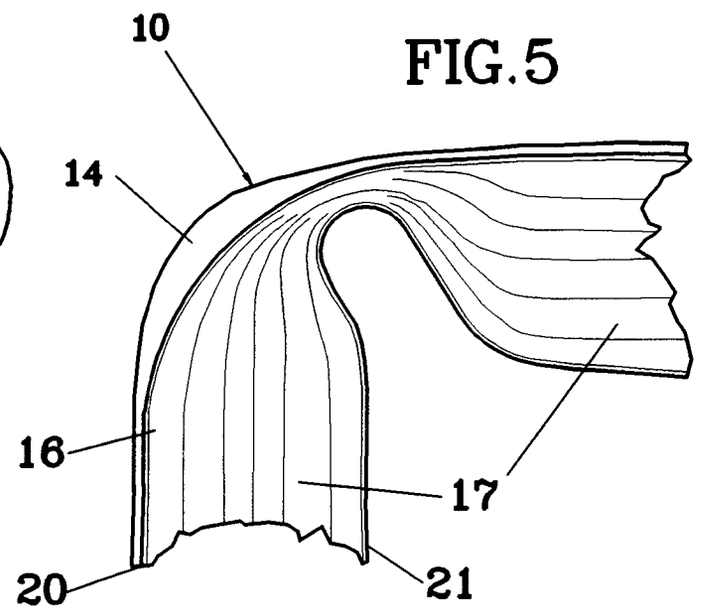


FIG.2

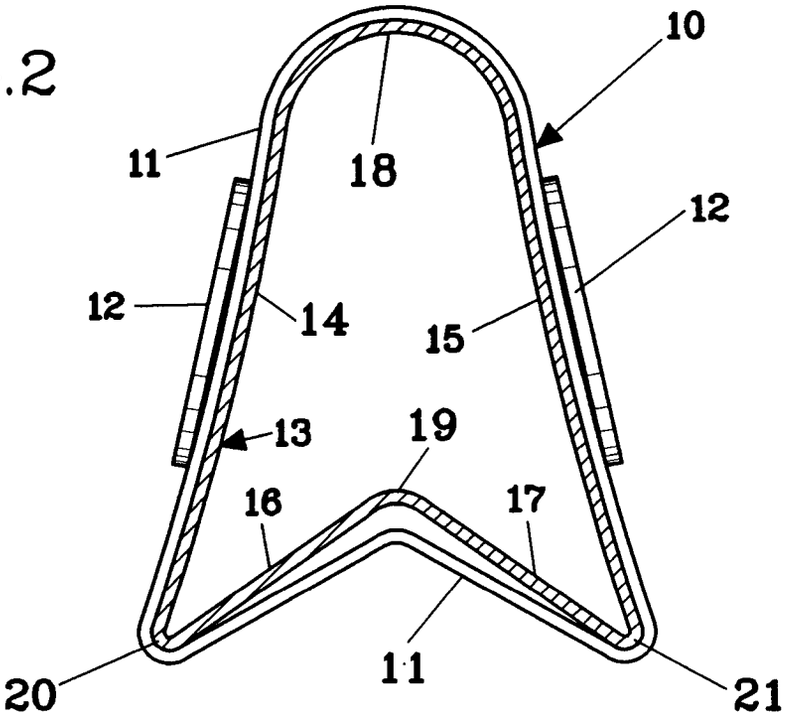
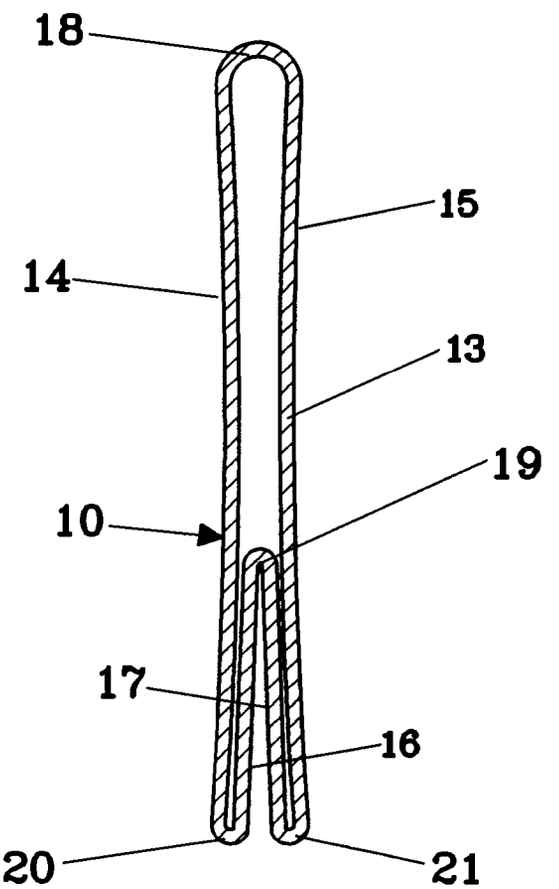


FIG.3



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EUROPEAN SEARCH REPORT

Application Number
EP 92 85 0247

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X Y	DE-B-2 609 222 (E.DÖRING) * column 4, line 24 - line 30; figure 2 *	1 2-4	E01F9/01
Y	FR-A-1 451 671 (M. PASQUIER) * abstract; figures *	2-4	
A	DE-A-3 402 098 (H.G. JÜRGENS) * page 8, line 30 - page 9, line 10; figures 1,2 *	1	
D,A	US-A-4 596 489 (J.F. MARIOL) * abstract; figures 3,5,5A,6 *	1	
A	DE-A-3 413 163 (J. BEILHARZ)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 JANUARY 1993	VERVEER D.

CATEGORY OF CITED DOCUMENTS

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