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(54) **ROADSIDE POST**

STRASSENPOSTEN

POTEAU PLACE AUX ABORDS DE LA ROUTE

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Description

[0001] The invention relates to roadside posts for supporting signage or delineating paths, roadways or boundaries.

[0002] Common examples of roadside posts include sign posts and guide posts, which are usually located on the edge or shoulder of roadways to delineate lanes and direct traffic. Guide posts are particularly effective when visibility is impaired, such as at night on unlit highways. Retro-reflective sheeting is commonly used on delineator guide posts in various grades to reflect light and indicate to motor vehicle drivers the varying contours and directions of the approaching section of road.

[0003] Roadside posts are often impacted and damaged by wayward vehicles and must be replaced or repaired. Timber posts will commonly fracture when impacted and must be replaced. Existing plastic or plastic/rubber composite posts are flexible and resilient enabling them to recover after impact. However, plastic or rubber posts tend to deteriorate due to UV exposure and repeated impacts over time. Steel posts have also been employed and are generally not resilient, plastically deforming upon impact and must be manually restraightened. Some known devices also employ a hinging mechanism between two or more rigid members. The hinging mechanism is typically a flexibly resilient rubber or plastic material. The rubber or plastic components of these posts also deteriorate due to UV exposure and repeated impacts. Other hinging mechanisms are either not resilient or complicated and expensive to manufacture.

[0004] Often the nature of the vehicle impact is a direct wheel-over in which the vehicle wheel rolls directly over the post pressing it flat against the surface of the ground. Known posts are installed in the ground to bend only above the surface of the ground and are therefore, not adapted to bend flat against the ground surface without enduring a tight right angle bend at the surface. During a direct wheel-over, flexible posts are forced to bend substantially at a tight right angle at the ground surface. Subsequently, during a direct wheel-over, crease points can occur in the post at the surface of the ground as the post is forced into a tight right angle bend. Tight right angle bends accelerate fatigue of the post and also increase plastic deformation in metal posts.

[0005] US 3312156, in the name of Pellowski, discloses a highway marking device comprising a strip element made from sheet spring steel and arcuate in cross section, which is adapted to bend over when it is struck by a vehicle in use, and then return to its upright position afterwards. However, the strip element is adapted to be mounted in concrete in a recess formed in a roadway, and has no means for being erected efficiently in soft ground by the side of a roadway.

[0006] It is the object of the present invention to substantially overcome or at least ameliorate one or more of the disadvantages of the prior art.

[0007] Accordingly, in a first aspect, the present inven-

tion provides a roadside post comprising an elongate body comprising a single component formed only from sheet spring steel, said body having a longitudinal axis, a transverse axis transverse to said longitudinal axis, a body front face and a body rear face, transversely extending generally parallel to said transverse axis, said body being elastically bendable through 90 degrees from an unbent state about said transverse axis and having a substantially arcuate transverse cross-section, characterised in which said body includes a mark at a position indicative of the location of the surface of the ground when said post is driven into the ground to a design depth, in which said body comprises a barb located between said mark and a first end of said body and projecting toward an opposing second end of said body, in which said first end of said body is tapered to enable said body to be driven into the ground, and in which said body is formed with a plurality of longitudinally extending ribs, each of said ribs having an apex separated from the apex of an adjacent rib by a trough.

[0008] Preferably, said body is formed from sheet spring steel having a Rockwell hardness of C40 to C47. Further preferably, said spring steel is high carbon steel C1075.

[0009] Preferably, said body has a width of approximately 75 mm to 120 mm. The sheet spring steel may have a thickness of approximately 0.9 mm to 1.5 mm.

[0010] Preferably said arcuate transverse cross-section has a radius of approximately 100 mm to 250mm.

[0011] The apex of each of the ribs is preferably separated by approximately 5 mm to 25 mm and the ribs preferably protrude approximately 0.2 mm to 0.8 mm from the trough between each rib.

[0012] A first end of said body can be adapted to be driven into the ground.

[0013] Typically, said body first end is tapered.

[0014] Further preferably, said mark in said body is a hole. Desirably, said mark is located approximately 50 mm to 150mm longitudinally distal of said first end of said body.

[0015] In a second aspect, the present invention provides a roadside post installation comprising said roadside post of the first aspect in which said post is driven into the ground.

[0016] Preferably, a recess is formed in the ground immediately adjacent said body to allow uninhibited bending of said body, said recess extending across either of said body front face and said body rear face.

[0017] Preferably, two of said recesses are formed in the ground, a first said recess extending across said body front face and a second said recess extending across said body rear face.

[0018] Desirably, said recess extends approximately 50 mm to 150 mm from said transverse axis at the surface of the ground.

[0019] The recess may have a depth of approximately 50 mm to 150 mm.

[0020] In a third aspect, the present invention provides

a method of installing the roadside post of the first aspect in the ground, said method comprising driving said post into the ground.

[0021] Preferably the method further comprises forming a recess in the ground immediately adjacent said body to allow uninhibited bending of said body, said recess extending across either of said body front face and said body rear face.

[0022] Preferred embodiments of the invention will now be described with reference to the accompanying drawings wherein:

Fig. 1 is a front elevation view of a post in an unbent state;

Fig. 2 is a plan view of the post of Fig. 1;

Fig. 3 is a side elevation view of a post installation with the post of Fig. 1 in a bent state;

Fig. 4 is an enlarged partial front elevation view of the post of Fig. 1;

Fig. 5 is an enlarged plan view of the profile of the post of Fig. 1;

Fig. 6 is an exploded detail view of the profile of Fig. 5.

[0023] Figs. 1 to 3 depict a roadside post 110. The post 110 comprises an elongate body 130 having a longitudinal axis L. The body 130 is formed from sheet spring steel, preferably having a Rockwell hardness of C40 to C47. The spring steel may be high carbon steel C 1075. The body 130 has a body front face 131 and a body rear face 133. The body 130 is elastically bendable through 90° about a transverse axis T transverse to the longitudinal axis L of the body 130. The body front and rear faces 131, 133 extend generally parallel to the transverse axis T.

[0024] Fig. 1 is a front elevation view of the post 110 in an unbent state, in which the body 130 extends longitudinally. The post 110 is installed by driving it longitudinally into the ground 100 so that the body 130 projects vertically from the ground 100. When installed to the design depth the body 130 projects 1000mm above the surface of the ground. A depth marker hole 135 is provided on the body 130, and is indicative of the ground surface level when installed to the design depth. The post 110 is accordingly driven into the ground 100 until the hole 135 is aligned with the surface of the ground 100.

[0025] The sheet spring steel from which the body 130 is formed has a thickness of 1.2mm. The arcuate cross section increases the stiffness of the body 130 in the unbent state, so as to inhibit bending of the body 130 under wind loads, including those generated by vehicles driving by, and biases the body 130 to the unbent state.

[0026] Fig.3 is a side view of the post of Fig.1 in a rearwardly bent state, for example, when impacted from front on by a vehicle in a direct wheel-over. When installed in the ground 100, a recess 50 is formed in the ground immediately behind the body 130 to allow uninhibited bending of the body 130. The recess 50 may be formed by removing a portion of the ground and extends

across the body rear face 133. The recess 50 is typically at least 100mm deep and extends at least 100mm rearwardly of the transverse axis L of the body 130 at the ground surface. This allows a bend radius of 100mm for the body 130 compared with a bend radius of near zero for tight right angled bends that occur in prior art post installations. This assists in enabling elastic bending of the body 130 and reduces fatigue, while allowing the body 130 to lie substantially prostrate on the surface of the ground 100 as the vehicle wheel rolls over the body 130. This minimises damage to the wheel, vehicle and post 110. The recess 50 may be filled with sand or another loose or compressible material without significantly affecting the bend radius.

[0027] After impact, the resilience of the spring steel and the bias of the cross section urge the body 130 to return to the undeformed state shown in Fig. 1,

[0028] The body 30 is able to bend through 90° from the vertical when impacted either from the front or the rear, bending about the transverse axis L to either side of the longitudinal axis T. To allow uninhibited bending of the body 130 when impacted from the rear, a further recess 51 may be formed in the ground forward of the body 130, and extending across the body front face 131 as depicted in Fig. 3.

[0029] The post 110 is powder coated to prevent corrosion.

[0030] Referring back to Figure 1, the first end 132 of the body 130 is adapted to be driven into the ground 100.

To facilitate driving of the body first end 132 into the ground, the body first end 132 is tapered. A ground retention barb 137 is formed in the body 130 toward the body first end 132 to assist in retaining the body first end 132 within the ground 100. The ground retention barb 137 is integrally formed with the body 130, being punched from the spring sheet steel. The ground retention barb 137 extends towards the body second end 134. A removal slot 136 is formed in the post body.

[0031] Referring specifically to Figures 4 through 6, the profile of the post body 130 may be formed with longitudinally extending ribs 138, pressed into the sheet spring steel, to form a very slight concertina type profile on the body front and rear faces 131, 133. The apex 138a of each of the ribs 138 may be separated by approximately 10 mm, and protrude by approximately 0.3 mm from the trough 138b between each rib 138. This profile acts to further stiffen the post body 130, and assist in elastic recoil of the post body 130 after being elastically bent.

[0032] Although preferred forms of the present invention have been described, it will be apparent to persons skilled in the art that modifications can be made to the preferred embodiment described above or that the invention can be embodied in other forms without departing from the scope of the claims.

Claims

1. A roadside post (110) comprising an elongate body (130) comprising a single component formed only from sheet spring steel, said body (130) having a longitudinal axis (L), a transverse axis (T) transverse to said longitudinal axis (L), a body front face (131) and a body rear face (133) transversely extending generally parallel to said transverse axis (T), said body (130) being elastically bendable through 90 degrees from an unbent state about said transverse axis (T) and having a substantially arcuate transverse cross-section, **characterised in** which said body (130) includes a mark (135) at a position indicative of the location of the surface of the ground (100) when said post (110) is driven into the ground to a design depth, in which said body (13) comprises a barb (137) located between said mark (135) and a first end (132) of said body (130) and projecting toward an opposing second end (134) of said body (130), in which said first end (132) of said body (130) is tapered to enable said body (130) to be driven into the ground (100), and in which said body (130) is formed with a plurality of longitudinally extending ribs (138), each of said ribs (138) having an apex (138a) separated from the apex (138a) of an adjacent rib (138) by a trough (138b).
2. The roadside post (110) of claim 1 wherein, said body (130) is elastically bendable through 90° from said unbent state about said transverse axis (T) to either side of said longitudinal axis (L).
3. The roadside post (110) of claim 1 wherein said body (130) is formed from sheet spring steel having a Rockwell hardness of C40 to C47.
4. The roadside post (110) of claim 3 wherein said spring steel is high carbon steel C1075.
5. The roadside post (110) of claim 1 wherein said body (130) has a width of approximately 75mm to 120 mm.
6. The roadside post (110) of claim 1 wherein said sheet spring steel has a thickness of approximately 0.9 mm to 1.5 mm.
7. The roadside post (110) of claim 1 wherein said arcuate transverse cross-section has a radius of approximately 100 mm to 250 mm.
8. The roadside post (110) of claim 1 wherein said mark (135) is a hole (135).
9. A roadside post installation comprising the roadside post (110) of any one of claims 1 to 8 in which said post (110) is driven into the ground.
10. The roadside post installation of claim 9 wherein a recess (50) is formed in the ground (100) immediately adjacent said body (130) to allow uninhibited bending of said body (130), said recess (50) extending across either of said body front face (131) and said body rear face (133).
11. The roadside post installation of claim 10 wherein said recess (50) extends approximately 50 mm to 150 mm from said transverse axis (T) at the surface of the ground (100).
12. The roadside post installation of claim 10 wherein said recess (50) has a depth of approximately 50 mm to 150 mm.
13. The roadside post installation of claim 10 wherein two of said recesses (50, 51) are formed in the ground (100), a first (51) of said recesses extending across said body front face (131), and a second (50) of said recesses extending across said body rear face (133).
14. A method of installing the roadside post (110) of any one of claims 1 to 8, said method comprising driving said post (110) into the ground (100).
15. The method of claim 14 wherein the method further comprises forming a recess (50) in the ground (100) immediately adjacent said body (130) to allow uninhibited bending of said body (130), said recess (50) extending across either of said body front face (131) and said body rear face (133).
16. The method of claim 15 wherein said recess (50) extends approximately 50 mm to 150 mm from said transverse axis (T) at the surface of the ground (100).
17. The method of claim 15 wherein said recess (50) has a depth of approximately 50mm to 150 mm.
18. The method of claim 15 wherein two of said recesses (50, 51) are formed in the ground (100), a first (51) of said recesses extending across said body front face (31) and a second of said recesses (50) extending across said body rear face (33).
19. The roadside post of claim 1 wherein said apexes (138a) of said adjacent ribs (138) are laterally separated by approximately 5 mm to 25 mm, and wherein each of said apexes (138a) protrudes by approximately 0.2 mm to 0.8 mm from the trough (138b) between each rib (138).

Patentansprüche

1. Straßenrandpfosten (110) mit einem länglichen Kör-

- per (130) mit einer einzigen Komponente, die nur aus einem Federstahlblech ausgebildet ist, wobei der Körper (130) eine Längsachse (L), eine Querachse (T) quer zur Längsachse (L), eine Körpervorderseite (131) und eine Körperrückseite (133), die sich quer im Allgemeinen parallel zur Querachse (T) erstrecken, aufweist, wobei der Körper (130) aus einem ungebogenen Zustand um 90 Grad um die Querachse (T) elastisch biegsam ist und einen im Wesentlichen bogenförmigen Querschnitt aufweist, **dadurch gekennzeichnet, dass** der Körper (130) eine Markierung (135) in einer Position umfasst, die den Ort der Oberfläche des Bodens (100) angibt, wenn der Pfosten (110) in den Boden in eine Planungstiefe getrieben wird, dass der Körper (13) einen Widerhaken (137) umfasst, der zwischen der Markierung (135) und einem ersten Ende (132) des Körpers (130) angeordnet ist und in Richtung eines entgegengesetzten zweiten Endes (134) des Körpers (130) vorsteht, dass das erste Ende (132) des Körpers (130) verjüngt ist, um zu ermöglichen, dass der Körper (130) in den Boden (100) getrieben wird, und dass der Körper (130) mit einer Vielzahl von sich der Länge nach erstreckenden Rippen (138) ausgebildet ist, wobei jede der Rippen (138) einen Scheitel (138a) aufweist, der vom Scheitel (138a) einer benachbarten Rippe (138) durch eine Mulde (138b) getrennt ist.
2. Straßenrandpfosten (110) nach Anspruch 1, wobei der Körper (130) aus dem ungebogenen Zustand um 90° um die Querachse (T) zu beiden Seiten der Längsachse (L) elastisch biegsam ist.
 3. Straßenrandpfosten (110) nach Anspruch 1, wobei der Körper (130) aus Federstahlblech mit einer Rockwell-Härte von C40 bis C47 ausgebildet ist.
 4. Straßenrandpfosten (110) nach Anspruch 3, wobei der Federstahl Stahl C1075 mit hohem Kohlenstoffgehalt ist.
 5. Straßenrandpfosten (110) nach Anspruch 1, wobei der Körper (130) eine Breite von ungefähr 75 mm bis 120 mm aufweist.
 6. Straßenrandpfosten (110) nach Anspruch 1, wobei das Federstahlblech eine Dicke von ungefähr 0,9 mm bis 1,5 mm aufweist.
 7. Straßenrandpfosten (110) nach Anspruch 1, wobei der bogenförmige Querschnitt einen Radius von ungefähr 100 mm bis 250 mm aufweist.
 8. Straßenrandpfosten (110) nach Anspruch 1, wobei die Markierung (135) ein Loch (135) ist.
 9. Straßenrandpfosten-Installation mit dem Straßenrandpfosten (110) nach einem der Ansprüche 1 bis 8, wobei der Pfosten (110) in den Boden getrieben ist.
 10. Straßenrandpfosten-Installation nach Anspruch 9, wobei eine Aussparung (50) im Boden (100) unmittelbar benachbart zum Körper (130) ausgebildet wird, um ein ungehindertes Biegen des Körpers (130) zu ermöglichen, wobei sich die Aussparung (50) entweder über die Körpervorderseite (131) oder die Körperrückseite (133) erstreckt.
 11. Straßenrandpfosten-Installation nach Anspruch 10, wobei sich die Aussparung (50) ungefähr 50 mm bis 150 mm von der Querachse (T) an der Oberfläche des Bodens (100) erstreckt.
 12. Straßenrandpfosten-Installation nach Anspruch 10, wobei die Aussparung (50) eine Tiefe von ungefähr 50 mm bis 150 mm aufweist.
 13. Straßenrandpfosten-Installation nach Anspruch 10, wobei zwei der Aussparungen (50, 51) im Boden (100) ausgebildet werden, wobei sich eine erste (51) der Aussparungen über die Körpervorderseite (131) erstreckt und sich eine zweite (50) der Aussparungen über die Körperrückseite (133) erstreckt.
 14. Verfahren zum Installieren des Straßenrandpfostens (110) nach einem der Ansprüche 1 bis 8, wobei das Verfahren das Treiben des Pfostens (110) in den Boden (100) umfasst.
 15. Verfahren nach Anspruch 14, wobei das Verfahren ferner das Ausbilden einer Aussparung (50) im Boden (100) unmittelbar benachbart zum Körper (130) umfasst, um ein ungehindertes Biegen des Körpers (130) zu ermöglichen, wobei sich die Aussparung (50) entweder über die Körpervorderseite (131) oder die Körperrückseite (133) erstreckt.
 16. Verfahren nach Anspruch 15, wobei sich die Aussparung (50) ungefähr 50 mm bis 150 mm von der Querachse (T) an der Oberfläche des Bodens (100) erstreckt.
 17. Verfahren nach Anspruch 15, wobei die Aussparung (50) eine Tiefe von ungefähr 50 mm bis 150 mm aufweist.
 18. Verfahren nach Anspruch 15, wobei zwei der Aussparungen (50, 51) im Boden (100) ausgebildet werden, wobei sich eine erste (51) der Aussparungen über die Körpervorderseite (31) erstreckt und sich eine zweite der Aussparungen (50) über die Körperrückseite (33) erstreckt.
 19. Straßenrandpfosten nach Anspruch 1, wobei die

Scheitel (138a) der benachbarten Rippen (138) um ungefähr 5 mm bis 25 mm seitlich getrennt sind und wobei jeder der Scheitel (138a) um ungefähr 0,2 mm bis 0,8 mm von der Mulde (138b) zwischen jeder Rippe (138) vorsteht.

Revendications

1. Poteau (110) de bord de route comprenant un corps allongé (130) comportant un seul élément uniquement fait de tôle d'acier à ressorts, ledit corps (130) ayant un axe longitudinal (L), un axe transversal (T) transversal par rapport audit axe longitudinal (L), une face avant (131) de corps et une face arrière (133) de corps s'étendant transversalement d'une manière globalement parallèle audit axe transversal (T), ledit corps (130) pouvant être cintré élastiquement sur 90° autour dudit axe transversal (T) à partir d'un état non cintré et ayant une section transversale sensiblement arquée, **caractérisé en ce que** ledit corps (130) comporte un repère (135) à un endroit indiquant l'emplacement de la surface du sol (100) quand ledit poteau (110) est planté dans le sol jusqu'à une profondeur donnée, ledit corps (130) comportant un picot (137) situé entre ledit repère (135) et une première extrémité (132) dudit corps (130) et faisant saillie vers une seconde extrémité (134), opposée, dudit corps (130), ladite première extrémité (132) dudit corps (130) étant conique pour permettre audit corps (130) d'être planté dans le sol (100), et ledit corps (130) étant pourvu d'une pluralité de nervures (138) s'étendant longitudinalement, chacune desdites nervures (138) ayant un sommet (138a) séparé du sommet (138a) d'une nervure adjacente (138) par un creux (138b).
2. Poteau (110) de bord de route selon la revendication 1, dans lequel ledit corps (130) peut être cintré élastiquement sur 90° autour dudit axe transversal (T) à partir d'un état non cintré, d'un côté ou de l'autre dudit axe longitudinal (L).
3. Poteau (110) de bord de route selon la revendication 1, dans lequel ledit corps (130) est en tôle d'acier à ressorts à dureté Rockwell de C40 à C47.
4. Poteau (110) de bord de route selon la revendication 3, dans lequel ledit acier à ressorts est de l'acier C1075 à haute teneur en carbone.
5. Poteau (110) de bord de route selon la revendication 1, dans lequel ledit corps (130) a une largeur d'environ 75 mm à 120 mm.
6. Poteau (110) de bord de route selon la revendication 1, dans lequel ladite tôle d'acier à ressorts a une épaisseur d'environ 0,9 mm à 1,5 mm.
7. Poteau (110) de bord de route selon la revendication 1, dans lequel ladite section transversale arquée a un rayon d'environ 100 mm à 250 mm.
8. Poteau (110) de bord de route selon la revendication 1, dans lequel ledit repère (135) est un trou (135).
9. Installation de poteau de bord de route comprenant le poteau (110) de bord de route selon l'une quelconque des revendications 1 à 8, dans laquelle ledit poteau (110) est planté dans le sol.
10. Installation de poteau de bord de route selon la revendication 9, dans laquelle un évidement (50) est formé dans le sol (100) au voisinage immédiat dudit corps (130) pour permettre un cintrage sans entraves dudit corps (130), ledit évidement (50) s'étendant d'un côté à l'autre de ladite face avant (131) du corps ou de ladite face arrière (133) du corps.
11. Installation de poteau de bord de route selon la revendication 10, dans laquelle ledit évidement (50) s'étend à la surface du sol (100) sur environ 50 mm à 150 mm depuis ledit axe transversal (T).
12. Installation de poteau de bord de route selon la revendication 10, dans laquelle ledit évidement (50) a une profondeur d'environ 50 à 150 mm.
13. Installation de poteau de bord de route selon la revendication 10, dans laquelle deux desdits évidements (50, 51) sont formés dans le sol (100), un premier (51) desdits évidements s'étendant d'un côté à l'autre de ladite face avant (131) du corps, et un second (50) desdits évidements s'étendant d'un côté à l'autre de ladite face arrière (133) du corps.
14. Procédé d'installation du poteau (110) de bord de route selon l'une quelconque des revendications 1 à 8, ledit procédé comprenant une étape consistant à planter ledit poteau (110) dans le sol (100).
15. Procédé selon la revendication 14, le procédé comprenant en outre une étape consistant à former un évidement (50) dans le sol (100) au voisinage immédiat dudit corps (130) pour permettre un cintrage sans entraves dudit corps (130), ledit évidement (50) s'étendant d'un côté à l'autre de ladite face avant (131) du corps ou de ladite face arrière (133) du corps.
16. Procédé selon la revendication 15, dans lequel ledit évidement (50) s'étend sur environ 50 à 150 mm depuis ledit axe transversal (T) à la surface du sol (100).
17. Procédé selon la revendication 15, dans lequel ledit évidement (50) a une profondeur d'environ 50 mm

à 150 mm.

18. Procédé selon la revendication 15, dans lequel deux desdits évidements (50, 51) sont formés dans le sol (100), un premier (51) desdits évidements s'étendant d'un côté à l'autre de ladite face avant (131) du corps, et un second (50) desdits évidements s'étendant d'un côté à l'autre de ladite face arrière (133) du corps.

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19. Poteau de bord de route selon la revendication 1, dans lequel lesdits sommets (138a) desdites nervures adjacentes (138) sont séparés latéralement d'environ 5 mm à 25 mm, et dans lequel chacun desdits sommets (138a) fait saillie sur environ 0,2 mm à 0,8 mm depuis le creux (138b) entre chaque nervure (138).

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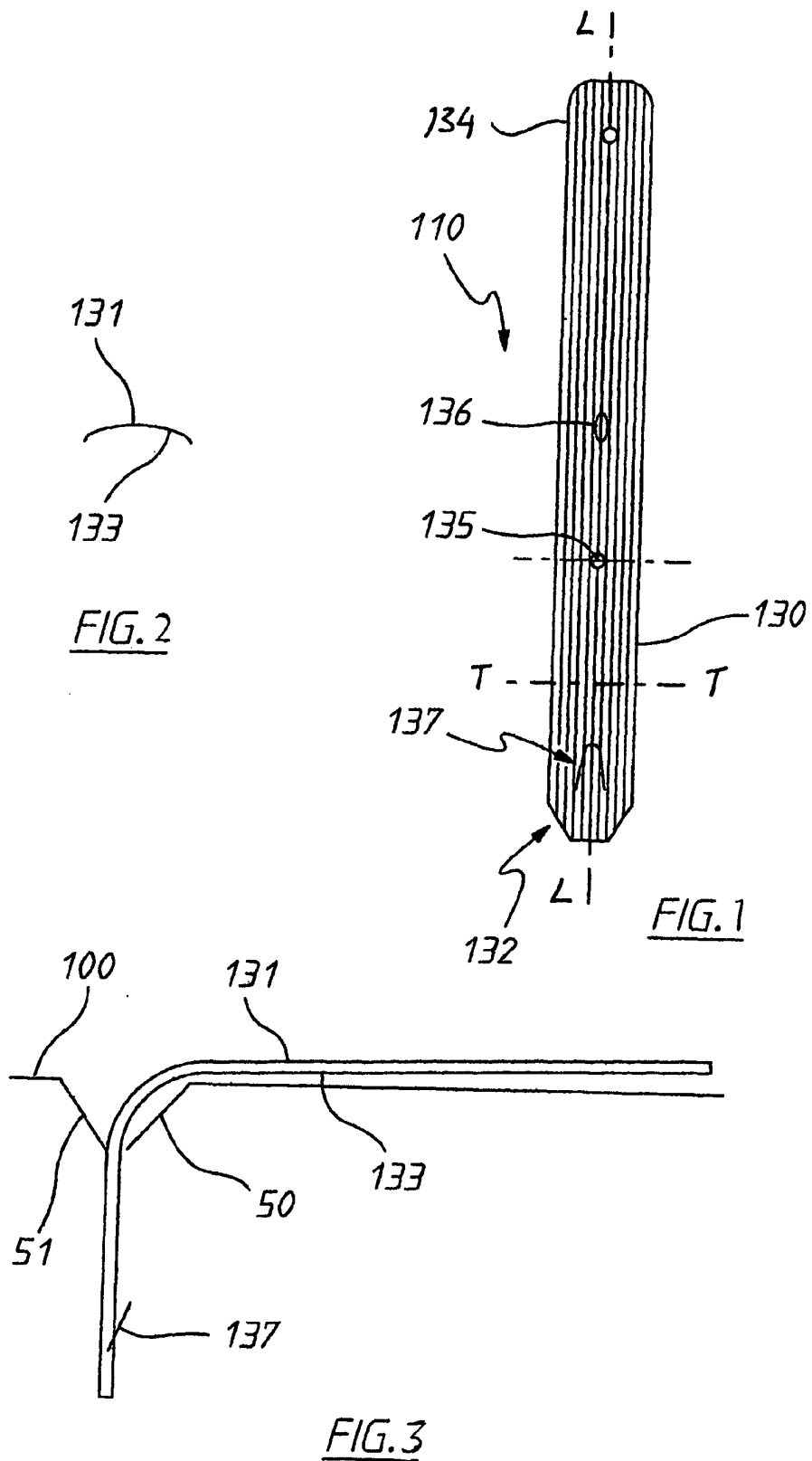
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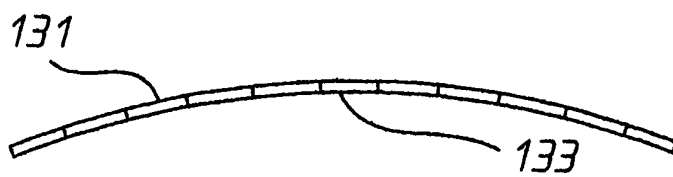


FIG. 5

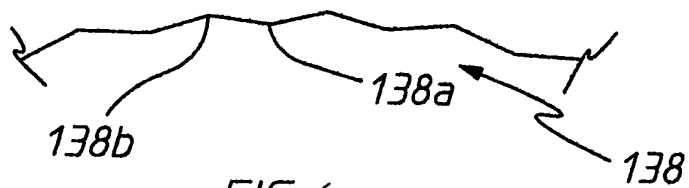


FIG. 6

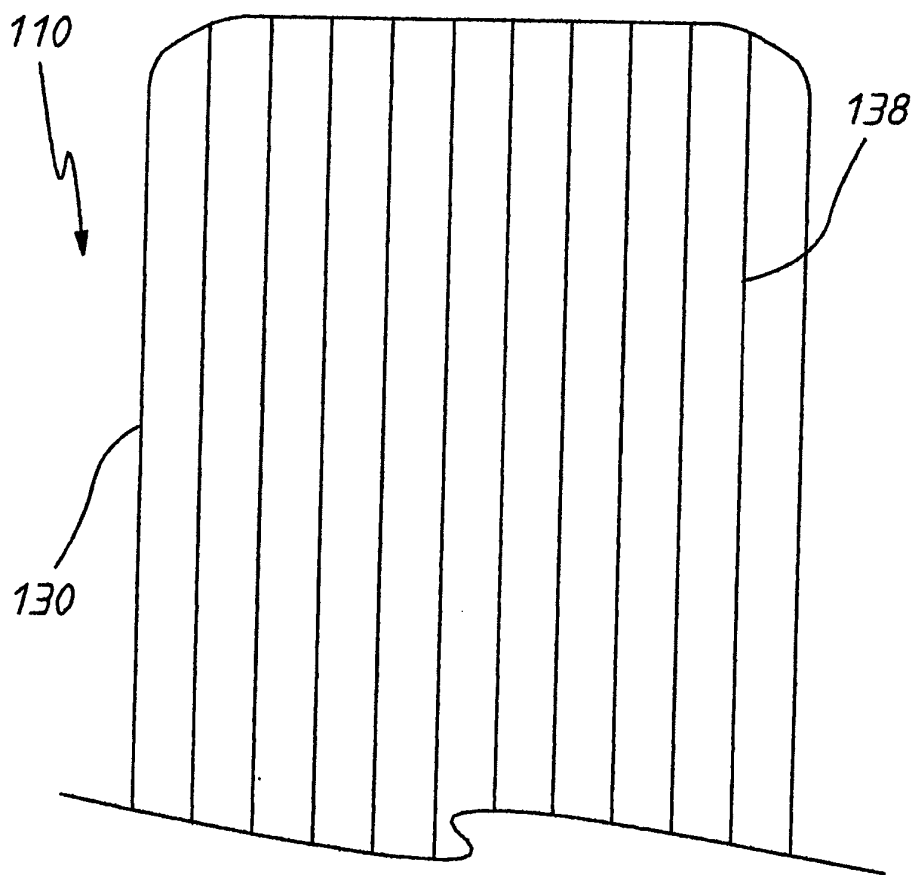


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 3312156 A, Pellowski [0005]