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(54) A mobile antenna for application on vehicle winding windows

(57) The present invention relates to a mobile antenna supported by a magnetic fork comprising two half-shells, each containing a magnet, connected by a bridge made up of a thin plastic strip moulded together with the two half-shells, featuring a short central section with reduced thickness, bordered by a close pair of transversal notches that allow for the bridge hinge-folding.

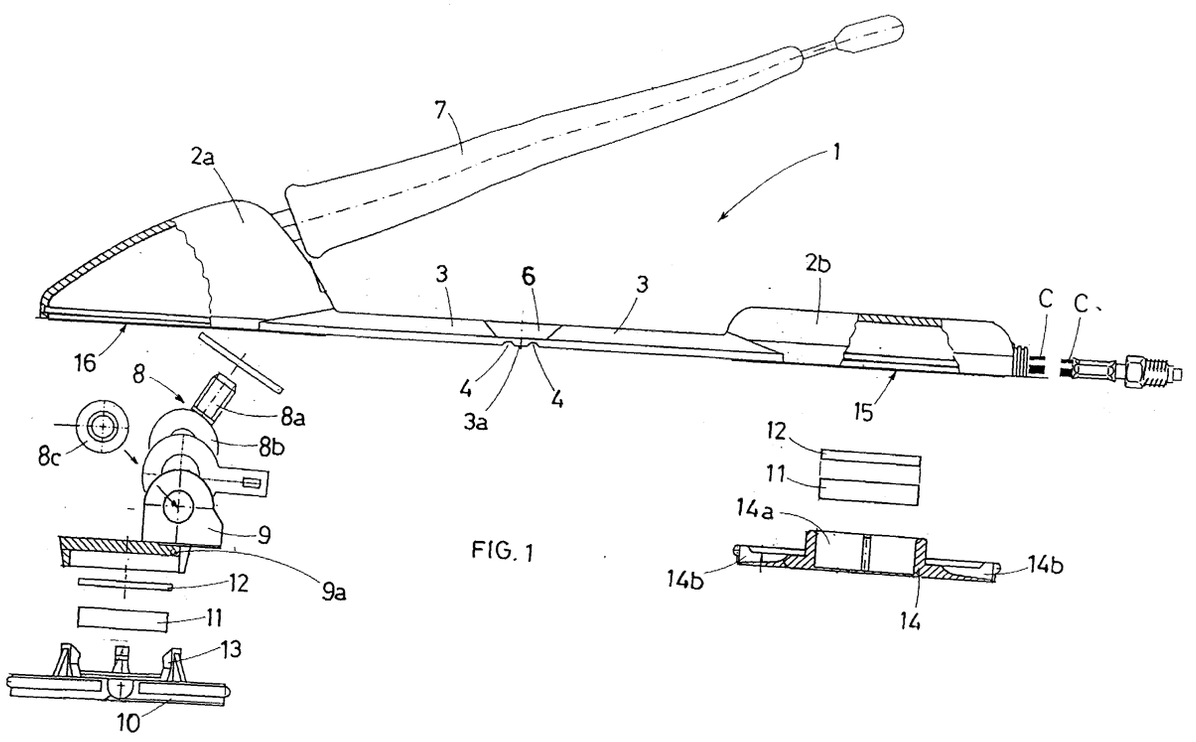

FIG. 1

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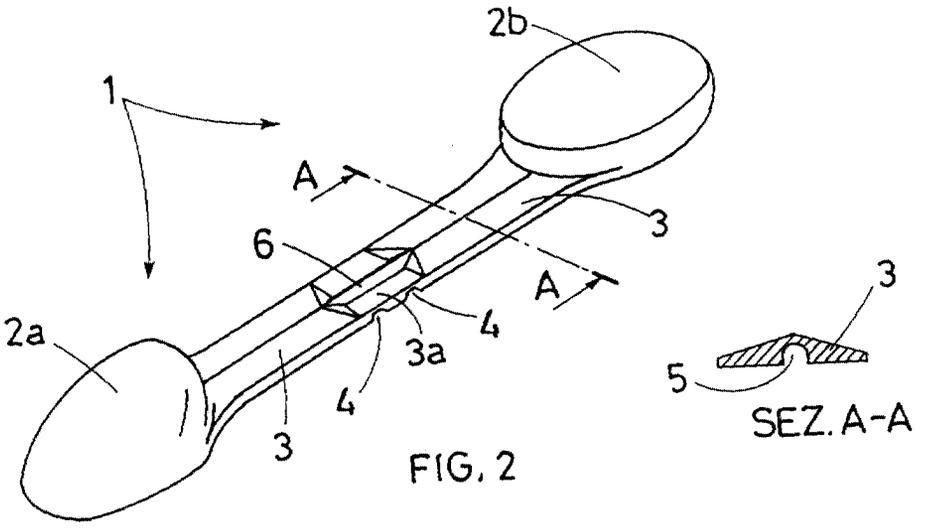

FIG. 2

Description

[0001] The present patent application relates to a mobile antenna supported by a magnetic fork for application astride vehicle winding windows.

[0002] The object of the present invention is to provide an improved model of the known type of antenna.

[0003] The applicant is the owner of the Italian patent no. 1275114, which describes a mobile antenna supported by a fork bracket for installation astride the upper edge of vehicle windows.

[0004] More precisely, the fork bracket is composed of an opposite pair of plastic moulded jaws containing a magnet and hinged with a pin inserted into one or more eyelets made on the upper edge of each jaw during moulding.

[0005] The external jaw - that is the jaw fitted against the external side of the window - is provided with an insertion element for the antenna rod, while the cable used to connect the antenna to the receiver or transmitter sticks out of the internal jaw.

[0006] Once the two jaws have been diverted and placed astride the window, the two magnets will hold them against the window, supporting the antenna in a stable, safe way, even when the vehicle is moving.

[0007] Although extremely practical in the assembling and disassembling operations, this type of mobile antennas is not very reliable, especially because of the reduced mechanical strength of the support fork in the hinge, where cracks or even breakage may occur easily.

[0008] More precisely, the need of reducing the dimensions of the hinge (in order to insert and hold the hinge in the seat of the window upper edge when the window closes completely) also affects the dimensions of the seat of the pivoting pin of the jaws, reducing the mechanical strength and therefore not guaranteeing the reliability of the articulation point.

[0009] The main object of the present invention is to provide an improved model of antenna in order to eliminate any risk of failure for the hinge of the support forks.

[0010] Another object of the present invention is to further reduce the thickness of the hinge, so that, once closed, the glass window can push the hinge into its seat with little effort.

[0011] These objects are achieved by the model of antenna according to the invention, whose support fork is composed of two opposite half-shells, containing a magnet, connected by a bridge that allows for placing them astride the upper edge of vehicle winding windows.

[0012] The bridge is made up of a thin plastic strip moulded together with the two half-shells and featuring a short central section with reduced thickness capable of acting as hinge and joint.

[0013] Apart from achieving the two objects above, this type of hinge also allows for eliminating the cost of the pivoting pin of the jaws, as well as the time and labour that are necessary for pin and jaw assembling in the known models of antenna.

[0014] For major clarity the description of the antenna according to the invention continues with reference to the enclosed drawings, which are intended for purposes of illustration and not in a limiting sense, whereby:

- Fig 1 is an exploded view of all components of the antenna according to the inventions
- Fig. 2 is an axonometric view of the antenna according to the invention;
- Fig. 3 is a view of the antenna according to the invention installed astride a vehicle winding window.

[0015] With reference to Fig. 1, the antenna (1) according to the invention is composed of two opposite half-shells (2a and 2b) connected by a bridge (3) made up of a thin strip of plastic material, which is moulded in a single piece with the two half-shells.

[0016] The bridge (3) has a short central section (3a) with reduced thickness bordered by a close pair of transversal notches (4) made on the lower side of the bridge (3) during moulding. The lower side of the bridge (3) also features a central longitudinal groove (5) ending inside the two half-shells (2a and 2b).

[0017] It appears evident the central section (3a) with reduced thickness and the close pair of transversal notches (4) allow for the central 180° folding of the bridge (3) so that the two half-shells (2a and 2b) can be placed in opposite position one against the other.

[0018] The central section with reduced thickness (3a) externally features a central longitudinal rib (6) with internal groove (5), suitable for housing the connection cable (C) of the antenna rod (7), which is screwed onto the external half-shell (2a) with mechanical joint (8) to allow for angular adjustments of the rod (7).

[0019] The joint (8) includes a threaded pin (8a) and a collar (8b), which is pivoted, by means of a rivet (8c), inside a moulded plastic support fork (9) protruding from a circular support platform (9a), moulded in a single piece with the fork (9).

[0020] The external half-shell (2a) is closed by an externally nickel-plated plastic bottom, whose internal side features a seat (not shown in the enclosed figures) for a neodymium magnet (11) and its magnetic amplifier (12) placed on the first one. An annular series of clips (13) surrounds the seat to engage the platform (9a) that acts as cover for the seat of the magnet (11).

[0021] The object of the external nickel-plating of the plastic bottom (19) is to act as fictitious earth plane for the best operation of the antenna. To this end, the copper plait that screens the cable (C) of the antenna (1) is soldered onto the nickel-plated surface of the bottom (10).

[0022] The internal half-shell (2b) is closed by a plastic bottom (14), whose internal side features a seat (14a) for a second neodymium magnet (11) and its amplifier, placed on the first one.

[0023] The edge of the bottom (14) features two dia-

metrically opposite notches (14b) for the antenna connection cable (C).

[0024] Finally, the edge of the two half-shells (2a and 2b) features a thin soft perimetric lip (16) with anti-slip function, capable of sticking to the window.

[0025] The plastic material used to mould the half-shells (2a and 2b) and the connection bridge (3) must have the following characteristics: abrasion resistance, high flexibility in temperature range, poor thermoplastic memory, oil, grease and solvent resistance and recyclability.

[0026] In view of the above, the most suitable material is the thermoplastic polyurethane produced by Bayer and marketed as "DESMOPAN".

Claims

1. A mobile antenna supported by a magnetic fork, designed for application astride vehicle winding windows, of the type comprising an opposite pair of jaws, connected and held by means of two magnets contained in the jaws, with the rod (7) of the antenna (1) directly fixed on the external jaw, characterised in that the jaws are made up of two half-shells (2a and 2b) closed by bottoms (10 and 14) and connected by a bridge (3), represented by a thin strip of plastic material, which is moulded together with the two half-shells in a single piece and features a short central section (3a) with reduced thickness bordered by a close pair of transversal notches (4) made during moulding on the lower side of the bridge (3), whose lower side also features a central longitudinal groove (5) ending inside the half-shells (2a and 2b), while the central section with reduced thickness (3a) externally features a central longitudinal rib (6), with internal groove (5), suitable for housing the connection cable (C) of the rod (7) of the antenna (1).

2. An antenna according to the previous claim, characterised in that each half-shell contains a neodymium magnet (11) and its magnetic amplifier (12).

3. An antenna according to the previous claims, characterised in that the closing bottoms (10 and 14) of the half-shells (2a and 2b) are made of moulded plastics and feature a seat for the neodymium magnets (11) and their amplifiers (12) on the internal side.

4. An antenna according to claims 1 and 3, characterised in that the external half-shell (2a) contains a mechanical joint (8) including a threaded pin (8a) and a collar (8b), which is pivoted by means of a rivet (8c) inside a moulded plastic support fork (9) protruding from a circular support platform (9a), which is moulded with the fork (9) in a single piece and fitted into an annular series of clips (13) protruding from the internal side of the bottom (10), with nickel-plated surface, on which the copper plait that screens the cable (C) of the antenna (1) is soldered.

5. An antenna according to claim 1, characterised in that the edge of the two half-shells (2a and 2b) features a thin soft perimetric lip (16) with anti-slip function.

6. An antenna according to claim 1 characterised in that the thermoplastic polyurethane produced by Bayer and marketed as "DESMOPAN" is used to mould the half-shells (2a and 2b) and their connection bridge (3).

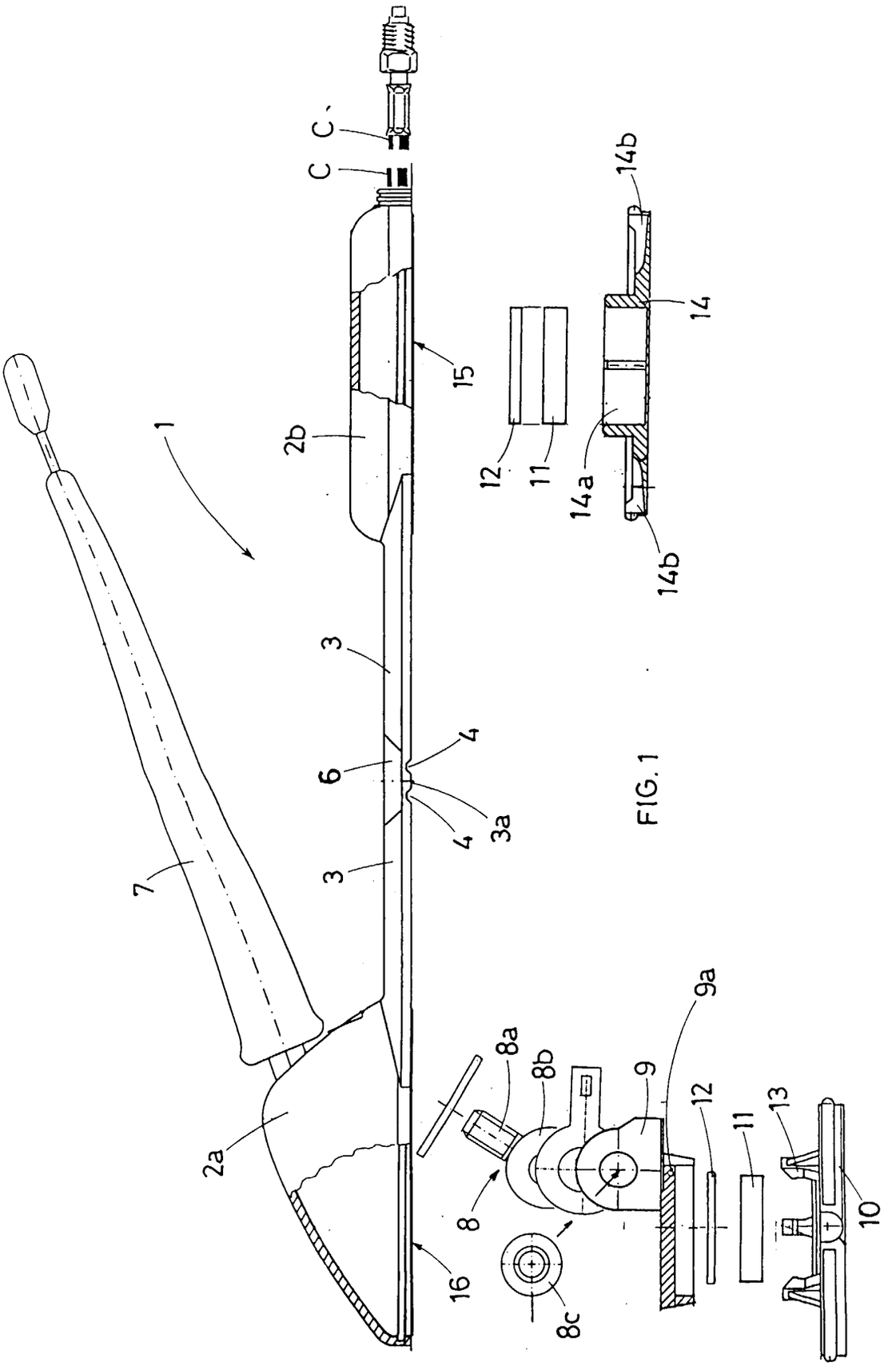
C
C'
1
2b
15
12
11
14b
14
14a
14b
3
4
6
3a
4
3
7
2a
16
8a
8b
9
9a
12
11
13
10
8
8c

FIG. 1

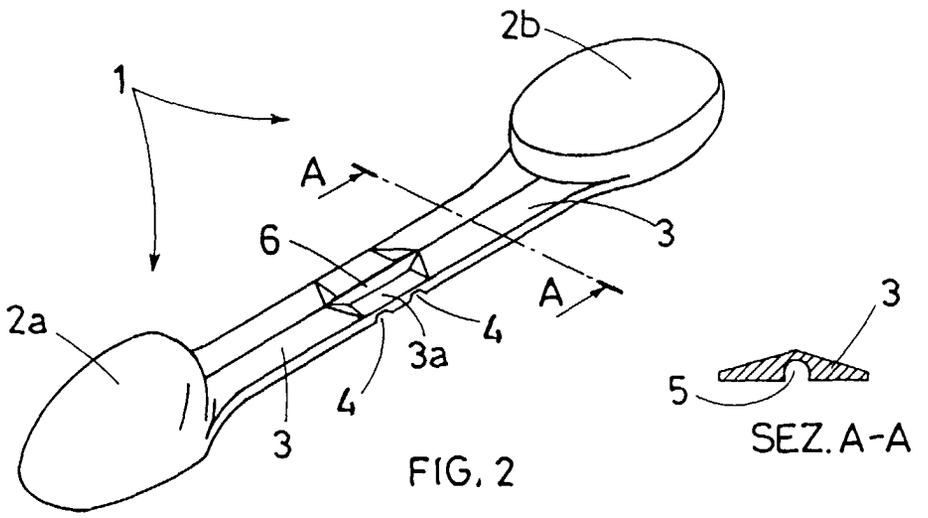

FIG. 2

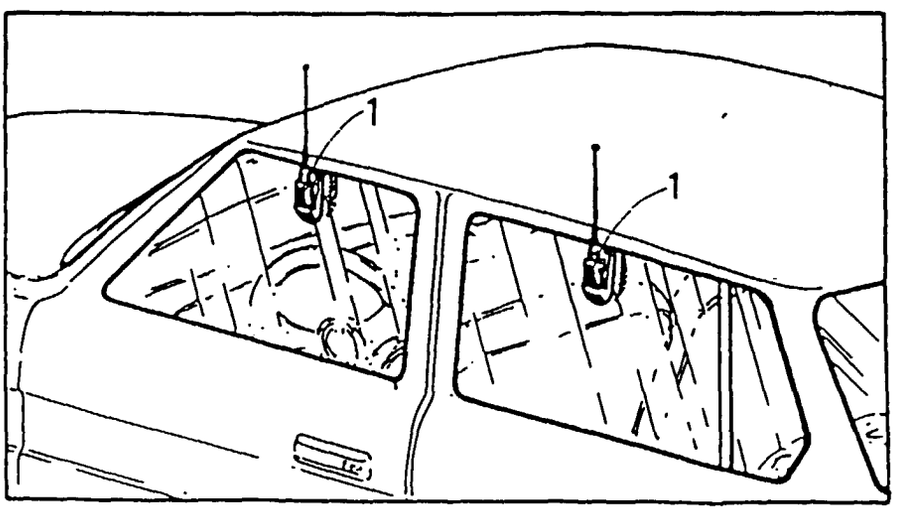

FIG. 3