ABSTRACT: An automobile antenna is formed by laminating an electroconductive wire, between two layers of a clear synthetic tape. One surface or side of the tape is self-adhering and is capable of adhering to a window surface. The tape is clear and will not yellow thereby not interfering with visibility. The electroconductive wire is electrically connected to a cable adapted to be inserted into the antenna receptacle in the automobile radio.
FIG. 1.

FIG. 2.

FIG. 3.

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ANTENNA FOR USE WITH AN AUTOMOBILE

BACKGROUND OF THE INVENTION

This invention relates to an automobile antenna, and more particularly, to an automobile antenna capable of easy installation.

Classically, automobile antennas include projecting telescoping metallic electroconductive members suitable for mounting on the front or rear fender. Unfortunately, such antennas are frequently the object of vandals' destructive actions which require their replacement when they are bent or broken. Further, the mounting for the automobile antenna frequently becomes loose requiring frequent repair. In order to eliminate the above-mentioned damage resulting from vandals, the automotive industry has adopted a self-retracting automatic automobile antenna. Such an antenna is relatively expensive, complex and frequently unsightly, often resulting in frequent malfunctions requiring expensive and frequent repair.

Another approach of the automobile industry has been to place the antenna within a portion of the automobile body thereby hiding it from vandals. As illustrative of such an approach, a U.S. Patent No. 3,208,070, issued to J. H. Boicey on Sept. 21, 1965 entitled AUTOMOBILE WINDSHIELD OF LAMINATED GLASS HAVING EMBEDDED ANTENNA WIRES, discloses a laminated glass with an antenna embedded therein. Such an approach eliminates the problems of the projecting-type automobile antenna, but the Boicey device has attendant serious disadvantages. For instance, with the antenna wire being embedded in the laminated glass, the entire glass must be replaced if for some reason the antenna wire becomes broken. Additionally, it is suggested that the antenna wire be located in the front window. It is obvious that such an approach while eliminating one problem, that is the vandalism problem, introduces several others, among them the need to replace a relatively expensive windshield if the embedded automotive antenna is not properly functioning. Further, the windshield is also frequently the object of vandalism's unmandated actions and thus, the replacement of a windshield having an embedded antenna wire is more expensive than the replacement of a conventional front window; and further, it is frequently more difficult to obtain such a window having the embedded antenna wires.

An object of the present invention is to provide an improved automobile antenna.

Another object of the present invention is to provide such an antenna which is relatively inaccessible to vandals.

Still another object of the present invention is to provide such an antenna which is relatively invisible.

Yet another object of the present invention is to provide such an antenna which is capable of easy installation.

Still another object of the present invention is to provide such an antenna which is capable of easy and relatively inexpensive replacement.

Another object of the present invention is to provide such an antenna which may be replaced and installed by the average consumer.

Yet another object of the present invention is to provide such an antenna which is capable of being attached or secured to a portion of the automotive body, such as the front windshield.

Other objects, advantages, and features of the present invention will become more apparent from the following description.

SUMMARY OF THE INVENTION

In accordance with the principles of the present invention, the above objects are accomplished by providing a self-adhering transparent or clear synthetic tape including two layers with an electroconductive wire laminated between the layers to form the antenna. The tape preferably is a crystal-clear polypropylene film and one of the outer surfaces of the laminated layers is provided with a self-adhering surface to enable the laminated or layer assembly to be attached or secured to the inside of the front windshield. The tape is so constructed as not to obstruct visibility and exhibits the characteristic of not yellowing with age. Additionally, the laminated layer assembly will not dry out with age, thereby enabling the tape to be securely fastened and attached to the inner surface of the front window.

The electroconductive wire preferably is thin so as not to obstruct the driver's vision. However, a wire of any suitable thickness could be utilized as a conductor of radio signals within the laminated tape assembly. The wire is flexible enough to permit installation over the dashboard and on the window surface. The length of tape running across the window may be as long as desired to permit AM reception. For FM reception, a length of no more than 44 inches is desirable since a greater length would not provide for adequate FM reception.

The laminated tape assembly will not crack, yellow or dry out in the severest of ambient temperature conditions. It may be seen that the present invention provides a relatively simple automobile antenna capable of easy installation for use with conventional AM and FM automobile radios. The self-adhering nature of the laminated clear plastic assembly permits easy installation on the inner surface of the front window. If for some reason, the antenna is inoperative or becomes defective, it may easily be replaced by merely removing the laminated layer assembly, as contrasted with the prior art requirement of replacing the entire front windshield. By securing the tape to the inner surface of the front windshield, the antenna is not accessible to vandals. To provide for ease of installation, the antenna is electrically connected to a shielded cable which terminates in a plug suitable for insertion into the antenna receptacle commonly found in the rear panel of automobile radios. A fastening lug suitable for grounding purposes is also provided on the shielded cable to enhance the reception obtained with the present automotive antenna.

IN THE DRAWINGS

FIG. 1 is a fragmentary view of the front dashboard and windshield assembly conventionally found in automobiles.

FIG. 2 is a perspective view of the automotive antenna of the present invention including a shielded cable and connecting plug.

FIG. 3 is a sectional view taken along lines 3-3 of FIG. 2 showing the laminated assembly of the present invention.

DETAILED DESCRIPTION

Referring to the Figures, and particular FIGS. 2 and 3, which illustrate an embodiment of the present invention, while FIG. 1 illustrates its method of usage, the automobile antenna is provided with a shielded cable 10 having an antenna lug 14 securely attached to one end of the shielded cable. A grounding lug 14 is secured around the other end of the shielded cable 10 for attachment to a ground point on the automobile. A suitable sheet metal screw is utilized for attaching the metal lug 14 to the automobile body. The shielded cable 10 generally includes an outer coating of shielding which covers the ground lug 14 and is electrically connected. The two inner conductors of the cable are separated in a pad member 16 which is connected to the lug end of the shielded cable 10. The inner conductors are then connected to an electroconductive wire which is laminated between two clear or transparent layers or strips, 20 and 22, having equal width forming a laminated assembly which carries the electroconductive wire therein. Each layer of the laminated layer assembly preferably, is a crystal-clear polypropylene film having adhering characteristics. The outer surface 32 of upper or first layer 22 preferably is nonadhering, while the inner surface 28 is adhering and does adhere to a nonadhering inner surface 30 of lower or second layer 20. The outer surface 26 of lower layer 20 is provided with a suitable adhesive or securing means to facilitate the securing of the laminated assembly to the front.
windshield of an automobile. Thus the polypropylene plastic film layers are connected to one another to form the laminated electroconductive assembly. The polypropylene film is a clear synthetic tape which is clear enough not to obstruct driver vision and which possesses the property of not yellowing with age. Further, the adhesive material used therewith, will not dry out under severe hot and cold ambient conditions. The laminated layer assembly is supplied in roll form for easy storage, unrolling and attachment to the front windshield.

FIG. 1 illustrates the present automobile antenna being connected to a radio 40. The antenna plug 12 is inserted into the antenna receptacle (not shown) in the rear of the radio. The grounding lug 14 is fastened to any available screw fitting under the dashboard to insure that the shielded cable is properly grounded. The adhering surface of the tape is then secured along the outer edge of the front windshield 42 in the manner shown in FIG. 1. Preferably, the antenna is secured along the right and upper edges of the window and, the antenna should not extend any longer than 44 inches if FM reception is desired. For AM reception only, the length of the antenna will not seriously detract from the reception achieved. The wire is of any thickness desirable, but should be sufficiently flexible to permit the installation of the antenna over the dashboard and on the inside surface of the front windshield.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above method and apparatus without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. An automotive radio antenna for attachment to an automobile windshield, comprising,
   a. a fine electroconductive wire,
   b. a first transparent strip of uniform width and being adhesive along one surface thereof,
   c. a second transparent strip of uniform width substantially of the same magnitude as the width of said first transparent strip, said second transparent strip being adhesive along one surface thereof,
   d. said first and second strips being secured in substantially juxtaposed coincident relation with said electroconductive wire therebetween with the confronting surfaces of said strips comprising the adhesive surface of said first strip and the surface other than the adhesive surface of said second strip,
   e. whereby a laminated assembly is formed having outer surfaces comprising, respectively, the adhesive surface of said second strip and the nonadhesive surface of said first strip, said laminated assembly being securable to said windshield surface along the adhesive surface of said second strip to define an antenna for said automobile.

2. An automotive radio antenna as set forth in claim 1, wherein said first and second transparent strips comprise polypropylene film tape.

3. An automotive radio antenna as set forth in claim 1, wherein there is provided cable means connected at one end thereof to said electroconductive wire and adapted to be connected at the other end thereof to an automobile radio.

4. An automotive radio antenna as set forth in claim 3, wherein said cable means comprises a shielded cable having a grounding lug, said grounding lug being electrically connected to the shield of said shielded cable and being adapted for securement to the body of the automobile.

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