This invention relates to protective covers for the motor and mountings for rotating television antenna systems. More specifically, this invention relates to a detachable cover for the motor and mountings in an antenna rotor installation which cover serves to both mechanically and electrically protect and shield the motor and mounting parts from the antenna lead wire and from the weather.

The advent of color television and the increased use of UHF channels has greatly increased the use of domestic rooftop directional antenna systems in which the antenna support shaft is rotated by a motor. Usually the housing is fixed to a rooftop support pole. Such systems, which are commonly referred to as "antenna rotors," present certain difficulties relating to the positioning and guidance of the antenna lead wire from the rotating antenna to the fixed guides leading downwardly from the antenna to the signal receiver. Because the antenna is mounted for rotation, the lead wire, which is normally a 300 ohm twin lead, must have sufficient slack between its uppermost fixed point and its point of attachment to the rotating antenna to follow the antenna through its path of movement. With a sufficient amount of slack, two problems are presented. First, this slack portion must be held away or spaced from any fixed projections on the motor housing or housing support pole and secondly, the antenna lead must be spaced from or shielded from the magnetic field of the motor in order to prevent interference with or attenuation of the incoming signal. This latter problem is especially critical in the case of color television where the influence of the motor upon the lead wire may result in an impedance mismatch with the receiver or may cause a slight phase shift in the incoming signal, thus destroying the clarity of the picture received.

One solution to the problem is disclosed in U.S. Patent 2,711,519 in which the fixed end of the antenna is connected to a pair of slip rings which are slidingly associated with commutators leading to the rotating antenna. Another solution is disclosed in U.S. Patent 2,682,609 in which the slack portion or bight of the antenna lead wire is mounted upon a flexible arm which holds the bight clear of the motor housing and associated support pieces.

The devices disclosed in these two prior art patents require the installation of either a completely new rotor system or extensive modification of the existing system.

Accordingly, it is an object of this invention to provide a protective antenna cover for use with the rotor motor housing and mounting devices for rotating antenna systems which will both mechanically and electrically separate the incoming signal lead from the rotor motor and its housing.

It is another object of this invention to provide an economical, removable protective cover which may be attached to the housing of the rotor motor support systems now in use and which will protect and shield the incoming signal leads from the rotor motor and its support installation.

It is still another object of this invention to provide a protective cover of the type described which shields the rotor motor housing and its supporting installation from the corrosive effects of the weather.

Other objects and advantages of this invention will be apparent from the following detailed description of a preferred embodiment thereof, reference being made to the accompanying drawings in which:

FIG. 1 is a view in elevation of a typical antenna rotor system showing the rotor motor housing secured to a fixed support pole by a number of laterally extending bolts or studs projecting from the rotor housing and showing the antenna lead extending from a fixed guide on the support pole to a rotating guide on the antenna support shaft;

FIG. 2 is a plan view of the protective antenna cover of this invention, viewed from the interior side thereof which is placed in contact with the rotor motor housing;

FIG. 3 is a partial view taken along line 3—3 of FIG. 2 showing a portion of the protective cover of this invention in the arcuate configuration it would assume when attached to a rotor motor housing;

FIG. 4 is an end view of the protective cover of this invention, taken along line 4—4 of FIG. 2;

FIG. 5 is a view in elevation, similar to FIG. 1 and showing an antenna rotor with the protective cover of this invention attached thereto; and

FIG. 6 is a top view, taken along line 6—6 of FIG. 5 and showing in phantom, a portion of the antenna cover of this invention prior to being snapped in position.

Referring first to FIG. 1, the rotor motor housing generally designated by reference numeral 10, is secured to a fixed support pole 11 by a flanged bracket 12 which is clamped to the support pole 11 by nuts which are threaded on a plurality of laterally extending bolts or studs 13 extending from the motor housing 10. In all common installations, a pair of studs 13 extends outwardly on each side of the support pole 11 for a substantial distance to accommodate various diameters of poles, depending upon the size of the antenna to be supported. Because these studs do extend a substantial distance in practice, one of the difficulties found in such installations is the fact that the signal lead, designated by reference numeral 14, often becomes hooked or fouled on one of the studs 13 when the antenna is rotated and the upper portion of the signal lead is carried by a rotating guide 15 from its broken line position at 14a and 15a around to its solid line position at 14 and 15. When so fouled by the stud 13, there is insufficient slack in the bight of the antenna lead wire 14 to allow the antenna and its shaft 16 to rotate without stretching or breaking the lead wire 14. Furthermore, as the lead wire 14 becomes hooked on the stud 13, it is drawn across the motor housing 10 where the influence of the motor may cause attenuation of the incoming signal, as previously explained. Accordingly, without some means of holding the lead wire 14 away from the motor housing 10 with a large enough bight to permit full rotation of the antenna and its shaft 15, the signal received by the receiver is impaired if not otherwise destroyed by pulling the lead wire 14 from the antenna.

Referring to FIG. 2, the protective cover of this invention comprises a generally elongate web or band which includes a solid rectangular body 17 at one end with a pair of spaced apart legs 18 and 19 extending therefrom. The legs 18 and 19 are joined by a transverse arm 20 and terminate in a generally spherical ball 21 which is secured to the end of the legs 18 and 19 by a restricted neck portion 22. As best seen in FIG. 3, the rectangular body portion 17 of the cover, when bent in an arcuate position, has a transversely extending channel 23 extending into the inner surface of the cover, that is, the surface which is adapted to be placed adjacent the motor housing 10 and the bracket 12 which is attached to the support pole 11 as previously described.

As best seen in FIG. 2, on each side of the channel 23 a plurality of stud holes or recesses 24 extend into the body portion 17 of the cover from the inner surface
thereof, on either side of the channel 23. These recesses 24 should be deep enough to completely receive the lowest bolt or stud 13 commonly supplied with commercially available rotor installations and should be of a diameter to receive the studs 13 snugly. For instance, a recessed diameter of ½" will accommodate commonly used stud sizes of ¾" and ¾". A number of closely spaced recesses 24 are positioned on either side of the channel 23 to accommodate the various spacings for the positions of the studs in various commercially available rotor installations. Thus, of the 12 recesses shown, only four would receive studs, depending upon the positions of the stud in the particular installation. Referring to FIG. 3, the top portion of each recess 24 has an area of size 25 which receives the nut on each of the studs 13. On each side of the generally flat surface through which the recesses 24 extend is an interlaced flange 26 which forms a pair of recesses to receive the edges of the bracket 12.

Each upper corner of the body portion 17, a restricted opening or socket 27 extends into the body portion from the outer end thereof, as best seen in FIG. 3. A separator portion 28 extends between the socket 27 and maintains them spaced apart a given distance. As best seen in FIGS. 3 and 6, the inner and outer edges of the separator portion 28, designated by reference numerals 29 and 30, extend past the lower side to support the adjacent surfaces of the legs 18 and 19 when the balls 21 are inserted in the socket 27. The antenna cover is preferably molded from a resilient plastic material, such as polyethylene, so that the size of the socket 27 may be made slightly less than the size of the complementary shaped ball 21 and the balls 21, when inserted in the sockets 27, will be held by friction with the restricted portion of the sockets 27 gripping the neck 22 joining the balls 21 to the end of the arm 18 or 19.

Referring to FIG. 6, the protective cover is installed by placing the inner surface of the body portion 17 adjacent the bracket 12 holding the motor housing 10 to the support pole 11 and pushing the studs 13 into the recesses 24. The sides of the bracket 12 may be inserted in the channels formed by the flanges 26 by snapping the flanges 26 over the edges of the bracket 12. The next and final installation step is to wrap the legs 18 and 19 around the motor housing 10 and snap each of the balls 21 into its respective socket 27.

The length of the entire cover portion is made to correspond substantially with the elliptical periphery of the motor housing 10 with the support pole 11 and bracket 12 attached. A single sized protective cover may be used for all commercially used in the invention described provides a universal cover for use with all types of commercially available rotor installations. As best seen in FIGS. 4 and 5, the outer upper and lower edges 31 and 32 extend outwardly from the main body portion 17 of the cover to provide a continuous surface extending around the motor housing 10 with the outer edges of the legs 18 and 19. With the balls 21 of the legs 18 and 19 inserted in place in the sockets 27, the continuous outer surface remains substantially unbroken, as best seen in FIG. 6. Thus a smooth sliding surface is provided to a side around as the antenna turns relative to the support pole 11. In addition, the antenna lead wire 14 is at all times spaced from and not in contact with the metal parts of the motor housing 10, the support pole 11 and the bracket 12.

It will be seen that the protective cover of this invention as described has several advantages. Firstly, it is adaptable to use with all commercially available antenna rotor installations. Secondly, because the protective cover covers the threaded installation of the motor housing 10 on the support pole 11, it protects the studs 13 from the corrosive elements to which they would be exposed and thus enables a serviceman to remove the unit for servicing or replacement without the necessity of sawing off corroded bolts, etc. Thirdly, the continuous outer surface of the installed protective cover provides a smooth sliding guide surface for the signal wire lead 14 as it is led around the rotor installation by the turning of the antenna relative to the support pole 11 and lastly, its covering over the signal wire 14 from the metal parts and the influence of the motor field.

It may be desirable to completely encompass the motor housing 10 to protect it from the weather and cut down radiation effects of its field, etc. Thus a second preferred embodiment would be similar to that described but with no open space between the legs 18 and 19, that is, with the web 20 enlarged to extend substantially from the neck portion 22 to the body portion 17 of the protective cover.

Various modifications of the above described preferred embodiment of the invention will be apparent to those skilled in the art and it is to be understood that such modifications may be made without departing from the scope and tenor of the accompanying claims.

I claim:

1. A removable cover for an antenna rotor housing secured to a support pole and having a plurality of spaced apart projecting members extending from one side thereof, said cover comprising an elongate web of flexible material having an inner and an outer major surface, a plurality of spaced apart recesses in said inner surface extending into said web and adapted to receive said projecting members of said rotor housing, at least one first attachment member in the outer surface of said web at one end thereof and at least one second attachment member extending from the other end of said web and adapted to join with said first attachment member, said first and second attachment members spaced apart a distance substantially equal to the peripheral distance around said rotor housing and support pole whereby, when said projecting members are received by said recesses with said inner major surface of said web adjacent said rotor housing, said web may be wrapped around said housing and support pole and said attachment members joined to one another to hold said cover tightly around the periphery of said rotor housing and support pole.

2. The removable cover of claim 1 wherein said elongate web includes a generally rectangular portion at said one end with a pair of spaced apart first attachment members in the outer surface thereof and a pair of elongate legs extending away from said sockets to said other end of said elongate web with a second attachment member on the end of each of said elongate legs.

3. The removable cover of claim 2 which further includes at least one reinforcing arm extending between and substantially normal to said elongate legs.

4. The removable cover of claim 1 wherein said first attachment member is a restricted socket extending into said web in the outer surface at said one end thereof and said second attachment member is a complementarily shaped ball adapted to be received and held by said socket.

5. The removable cover of claim 4 wherein said socket extends into said web at one end thereof in a direction substantially perpendicular to the surface of said web.

6. The removable cover of claim 1 which further includes a recessed channel in said inner major surface extending normal to the major axis of said elongate web intermediate said plurality of spaced apart recesses.

7. The removable cover of claim 1 wherein said plurality of spaced apart recesses comprise a series of cylindrical
8. The removable cover of claim 1 which further includes a flange on each side of said plurality of recesses, each of said flanges extending normal to the axis of said elongate member and projecting inwardly of said inner major surface.