

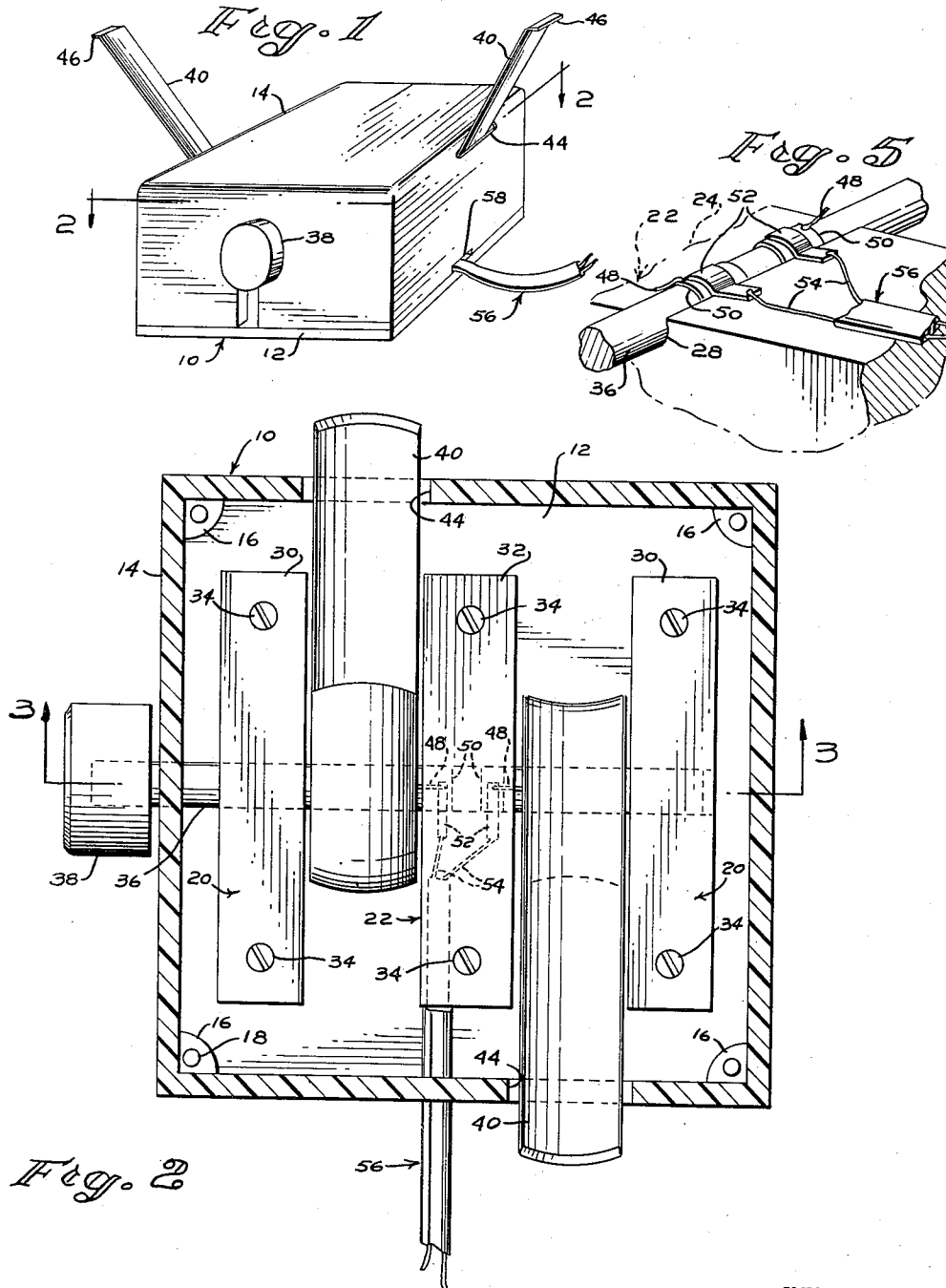
Jan. 15, 1957

C. DORCSJAK
PORTABLE ANTENNA

2,778,017

Filed Jan. 21, 1955

2 Sheets-Sheet 1



INVENTOR.

CHARLES DORCSJAK
BY

McMURROW, Berman & Davidson
ATTORNEYS

Jan. 15, 1957

C. DORCSJAK
PORTABLE ANTENNA

2,778,017

Filed Jan. 21, 1955

2 Sheets-Sheet 2

Fig. 3

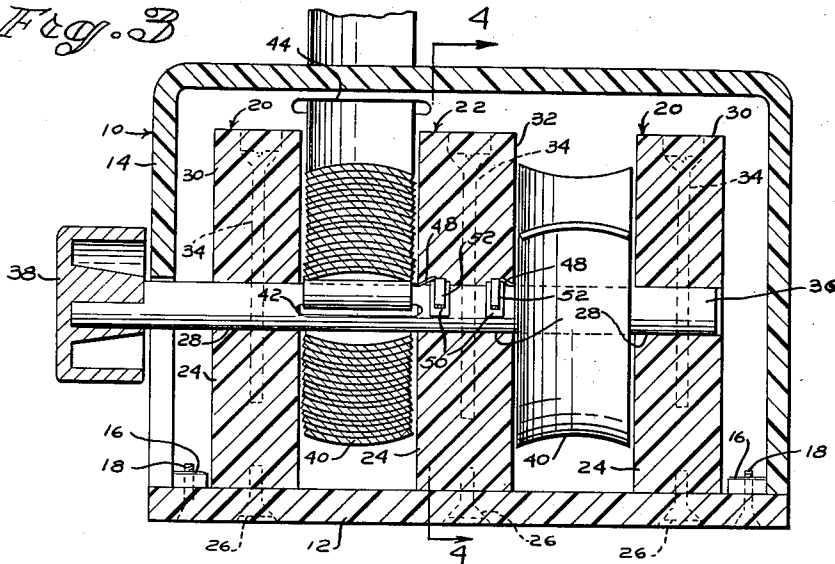


Fig. 1

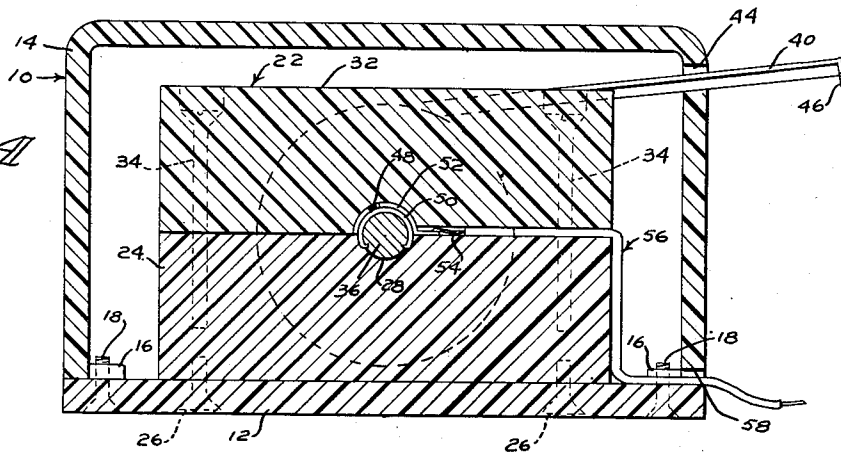
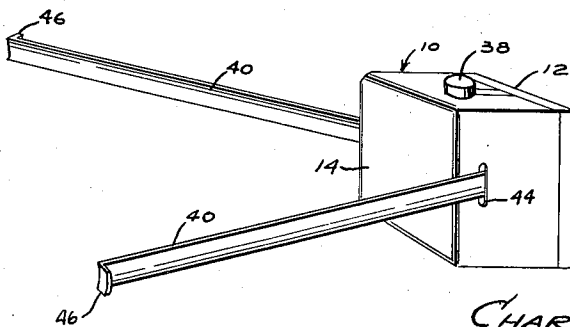


Fig. 6



INVENTOR.

CHARLES BY DORCSTAK

McMorrow, Berman & Davidson
ATTORNEYS

1

2,778,017

PORTABLE ANTENNA

Charles Dorcsjak, Cranford, N. J., assignor to Marjo Technical Products Co., Linden, N. J., a corporation of New Jersey

Application January 21, 1953, Serial No. 332,225

2 Claims. (Cl. 343—823)

This invention relates to an improved portable indoor antenna for but not necessarily restricted to association with, a television receiver.

Summarized briefly, my invention is an antenna that includes a housing having a manually rotatable shaft journaled therein, a pair of spaced, conductive tapes wound around the shaft and to be wound upon or unwound from the shaft responsive to rotation of the shaft in opposite directions. The tapes have free ends extending through openings formed in opposite walls of the housing, and thus, when the shaft is rotated in one direction, the free ends of the tapes, constituting antenna arms, are projected outwardly from the housing in opposite directions to selected lengths. Conversely, when the shaft is rotated in a tape-winding direction, the antenna arms can be retracted until they are disposed entirely within the housing, with the exception of small, flanged tips on the free ends of said arms.

A well known type of indoor television antenna in widespread use today includes telescopic arms of rod material. Even when said arms are telescoped to their maximum extent, they remain of substantial length, presenting an unsightly appearance and making inconvenient the handling and storage of the antenna.

One important object of the present invention is to provide an antenna in which the extensible arms are fully retractile into a small, box-like housing.

Further, a conventional indoor antenna of the type noted above requires that the antenna arms be gripped manually to extend or retract them. A second important object of the present invention is to provide for extension or retraction of the antenna arms by rotation of a knob, which knob is fully insulated from the conductive tapes that form the arms, so that effects of body capacitance of the operator during adjustments of the arms are eliminated.

Yet another object is to provide an antenna construction in which both the antenna arms are adjusted as to length simultaneously, and to the same extent. It is a fundamental principle in the construction of television antennae that both arms should be of equal length at all times. Obviously, a telescopic type antenna in which one arm is manually adjusted independently of the other arm makes it difficult to retain the arms at lengths equal to one another, in selected positions of adjustment.

Still another important object of the invention is to provide a portable antenna device which can be adjusted bodily to a position in which it will receive efficiently ultra-high frequency signals. Thus, it is proposed that the antenna will be well adapted to receive not only very high frequency signals, but also signals in the ultra-high frequency range.

A still further object of importance is to provide an antenna formation which, though possessing the several desirable features noted above, is capable of manufacture at relatively low cost, is trouble free in operation, and attractive in appearance.

Other objects will appear from the following descrip-

2

tion, the claims appended thereto, and from the annexed drawings in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a perspective view of a portable antenna formed in accordance with the present invention;

Figure 2 is an enlarged sectional view taken substantially on line 2—2 of Figure 1;

Figure 3 is a sectional view taken substantially on line 3—3 of Figure 2;

Figure 4 is a sectional view on line 4—4 of Figure 3;

Figure 5 is a fragmentary perspective view showing the means for maintaining an electrical connection between the antenna arms and a lead-in cable; and

Figure 6 is a perspective view showing the antenna as it appears when positioned to receive ultra-high frequency signals.

The illustrated antenna of the present invention includes a hollow, rectangular, box-like housing designated generally at 10 and formed of molded plastic or other electrically insulative material. The housing 10 has a flat, rectangular base 12 and a cover 14 formed with a peripheral, depending flange that defines side walls and end walls of the housing. Within the several corners of the cover, enlargements 16 are formed, said enlargements being disposed in contact with the base 12 and having threaded openings receiving connecting screws 18 that extend through smooth walled openings formed in the corners of the base. Thus, the cover is detachably connected to the base, and can be readily removed whenever access to the interior of the housing is desired.

Upon the base, there are secured a plurality of shaft supports, said shaft supports including end supports 20 near and spaced from the housing end walls 19, and a middle shaft support designated generally at 22 (Figure 2). The middle shaft support is disposed in the space between the end supports, and is spaced equidistantly from the respective end supports.

Each of the supports 20, 22 is formed of a lower block and an upper block, the lower blocks of all three supports being identically formed and being designated by the reference numeral 24. The lower blocks are of solid formation, and are of rectangular, relatively elongated shape. Each lower block has a threaded recess formed in the underside thereof, adjacent its respective ends, and connecting screws 26 are engaged in said recesses, said connecting screws extending through smooth walled openings formed in the base 12. Thus, the several lower blocks 24 are fixedly connected to the base 12, during the assembly of the device.

In the upper surface of each lower block 24, medially between the opposite ends thereof, a transversely disposed, half-round, bearing recess 28 is provided, the several recesses 28 being aligned coaxially, for a purpose to be made presently apparent.

The end supports 20 have upper blocks 30, that overlie the lower blocks of said end supports, while the middle support 22 is provided with an upper block 32, which differs slightly in construction from the upper blocks 30. The upper blocks 30 have, in their undersides, transversely disposed, half-round, bearing recesses opposing the recesses 28 of their associated lower blocks, so as to cooperate with said associated lower blocks in forming transverse bearing openings in the end supports 20.

The upper block 32 also has, in its underside, a transversely extended bearing recess half-round in cross sectional configuration, but the recess of the block 32 is slightly greater in respect to the radius thereof than are the recesses of the blocks 30. The purpose of this arrangement is to provide a clearance space for a pair of brushes or contact elements, to be described in detail hereinafter.

In any event, it is seen that the construction illus-

trated and described provides a plurality of shaft supports, all of which have transversely disposed, coaxially aligned bearing openings. It may be noted, in this regard, that after the upper blocks are positioned upon their associated lower blocks, they are fixedly secured thereto by elongated screws 34 (Figure 4), said screws 34 extending downwardly through smooth walled openings formed in the opposite ends of the respective upper blocks, and being threadedly engaged in aligned, complementarily threaded recesses extending downwardly from the top surfaces of the lower blocks 24.

Journalled in the several bearing openings of the shaft supports is a shaft 36 of electrically insulative material, one end of said shaft projecting through an opening formed in one end wall of the housing, and being fitted with a knob 38. The knob 38 is secured to the shaft 36 in any suitable manner, for the purpose of rotating the shaft whenever antenna adjustments are to be effected. The projecting end of the shaft can, for example, be of half-round formation, with the knob 38 having a complementary, half-round recess receiving the projecting portion of the shaft.

In the spaces defined between the middle shaft support and the respective end shaft supports, coiled tapes 40 of conductive material are disposed. The tapes 40 are of spring steel, in a preferred embodiment of the invention, and are concaved transversely, so as to cause any portion of the tape that is unwound to extend as a rigid member, this construction being nevertheless well adapted to permit the tapes to be wound or unwound, as necessary.

As will be noted from Figure 3, the tapes are relatively wide as compared to the thickness thereof, it having been found that this permits better reception, since there is more surface area than is obtained by the use of metal tubular rods or the like.

Both of the coiled tapes 40 are secured to the shaft 36 at their inner ends, and to illustrate one manner in which the inner ends of the coiled tapes can be secured to the shaft, there is shown, in Figure 3, a longitudinal slot 42 formed in the shaft 36 for each coil. The slots 42 extend diametrically through the shaft, opening upon diametrically opposite sides of the shaft, and extending through each slot is the inner end of each tape, said end being bent about the shaft after being passed through the slot. Thereafter, the tape is coiled about the shaft, and is wound or unwound from the shaft responsive to the rotation of the shaft in opposite directions.

In the side walls of the housing at opposite sides of the shaft 36, I form slot-like apertures 44, said apertures being spaced a substantial distance above the base 12, adjacent the top portion of the cover 14. This location of the apertures is desirable, since said apertures are thus disposed above the periphery of each tape, when the tape is fully wound. As a result, when the free ends of the respective tapes are extended through the apertures 44 in the manner shown in the several figures of the drawing, unwinding of the tape coils will be effective to extend said free ends of the tapes upwardly and outwardly from the opposite side walls of the housing through which the tapes project.

As will be readily observed from Figures 1, 4, and 6, the projecting, free ends of the tapes 40 have small, downturned lips 46, said lips defining abutments which prevent complete retraction of the tapes into the housing, by reason of engagement of the abutments against the side walls of the housing in which the apertures 44 are formed. However, with the lips 46 engaging said side walls, the free ends of the tapes, that constitute the antenna arms, are substantially invisible, and the overall bulk of the device is substantially defined by the size of the housing alone.

It should be noted that both of the tapes are coiled upon the shaft 36 in the same direction, and therefore, both tapes will be simultaneously wound or simultaneous-

ly unwound, depending upon the direction in which the shaft is rotated.

That part of the shaft 36 that extends through the bearing opening of the middle shaft support 22 is provided with a pair of longitudinally spaced circumferential contacts 50 to which leads 48 are soldered and which are severally connected to the shaft-attached inner ends of the coiled tapes. The contacts 50 are shown to particular advantage in Figures 3, 4, and 5. Each contact 50 is formed as an arcuate piece of metal material, the ends of which are clinched into or otherwise embedded in the material of the shaft.

Engaging each contact 50 is a brush 52, said brushes being of electrically conductive material. The purpose of forming the half-round recess provided in the underside of the upper block 32 of the middle support 22 to a greater diameter than the corresponding recesses of the upper blocks 30, is to provide a clearance space for said brushes, this construction being best shown in Figure 4.

The brushes 52 are arcuate and conformably engage the contacts 50 in any position to which the shaft 36 is rotated, due to the length of the contacts 50. The brushes 52 have ends which are attached permanently to leads 64 of a lead-in cable 56, that extends out of the housing through a slot 58 formed in one side wall of the cover 14. The underside of the middle upper block 32 is secured as necessary to accommodate the lead-in cable 56, and the cable is to be connected to a television receiver or the like, not shown.

In Figure 6, I have shown the antenna device turned bodily out of the erect position thereof shown in Figure 1, to a reclining position in which that end wall opposite the knob 38 rests upon a support, such as an associated television receiver. In this position of the antenna, the arms 40 are disposed horizontally, and it has been found that this arrangement results in an efficiently operating ultra-high frequency antenna, this being considered to be an important characteristic of the invention.

It is also thought to be an important characteristic of the construction that the device is attractive, and when not in use, takes up a minimum of space, due to the complete retractibility of the antenna arms. At the same time, a marked degree of efficiency is obtained during use.

It is also believed important to note that the knob 38 and/or the antenna arms can be calibrated as to length, channel number, wave length, etc. This is believed to be sufficiently obvious as not to require special illustration, and it is contemplated that in commercial embodiments of the device, such calibrations might well be desirable.

It is also thought worthy of note that dimensions, materials, etc., might be varied within the scope of the appended claims, and the antenna could, for example, be of any suitable material such as steel, Phosphor bronze, plastic coated with electrically conductive material, and the like.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. In a portable antenna, an insulative flat base having ends and sides and an upper surface, a removable insulative cover comprising a top wall and end walls and side walls depending from said top wall, said walls having lower edges removably resting upon the upper surface of the base, means removably securing the cover to the

base, end supports secured to and rising from the upper surface of the base near to and spaced from the end walls of the cover, a middle support secured to and rising from the upper surface of the base between and spaced from said end supports, said supports comprising lower blocks having upper edges provided with longitudinally aligned semi-circular bearing recesses and upper blocks having lower edges resting upon the upper edges of the lower blocks, said lower edges having semi-circular bearing recesses registered with the bearing recesses of the lower blocks, a non-conductive shaft journaled in the registered bearing recesses, one of said cover end walls having an opening aligned with the bearing recesses and said shaft having an end portion extending out of the cover through said opening, a knob on said end portion, each of the cover side walls having a slot in line with the space between an end support and the middle support, the slots being located on a level above said shaft, a flexible resilient conductive tape extending through each of said slots, the tapes having inner ends wound around and secured to the shaft between the middle support and related end supports and outer ends, stops on the outer ends of the tapes for engagement with related side walls of the cover, the inner ends of the tapes being wound in the same direction on the shaft, and contact means connected to the inner ends of the tapes and arranged to be connected to a lead-in cable.

2. In a portable antenna, an insulative flat base having ends and sides and an upper surface, a removable insulative cover comprising a top wall and end walls and side walls depending from said top wall, said walls having lower edges removably resting upon the upper surface of the base, means removably securing the cover to the base, end supports secured to and rising from the upper surface of the base near to and spaced from the end walls of the cover, a middle support secured to and rising from the upper surface of the base between and spaced from said end supports, said supports comprising lower blocks

having upper edges provided with longitudinally aligned semi-circular bearing recesses and upper blocks having lower edges resting upon the upper edges of the lower blocks, said lower edges having semi-circular bearing recesses registered with the bearing recesses of the lower blocks, a non-conductive shaft journaled in the registered bearing recesses, one of said cover end walls having an opening aligned with the bearing recesses and said shaft having an end portion extending out of the cover through said opening, a knob on said end portion, each of the cover side walls having a slot in line with the space between an end support and the middle support, the slots being located on a level above said shaft, a flexible resilient conductive tape extending through each of said slots, the tapes having inner ends wound around and secured to the shaft between the middle support and related end supports and outer ends, stops on the outer ends of the tapes for engagement with related side walls of the cover, the inner ends of the tapes being wound in the same direction on the shaft, and contact means connected to the inner ends of the tapes and arranged to be connected to a lead-in cable, said contact means comprising a pair of longitudinally spaced circumferential arcuate contacts fixed on said shaft within the registered bearing recesses of said middle support, a pair of arcuate brushes conformably and severally engaged with said contacts within the registered bearing recess of said middle support, leads severally connecting the contacts with the inner ends of the tapes, and leads on the brushes for connection to a lead-in cable.

References Cited in the file of this patent

UNITED STATES PATENTS

2,565,661	Lidz	Aug. 28, 1951
2,568,465	Scott	Sept. 18, 1951
2,569,810	Hamel et al.	Oct. 2, 1951
2,574,733	Ehrlich	Nov. 13, 1951
2,589,174	Wargo	Mar. 11, 1952