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(54) **Radiant-slot television aerial, especially for indoor use.**

(57) Indoor radiant slot television aerial, comprising in combination, a plate (1), having an electrically conducting surface, with a radiant slot (2) which extends along two sides, leading off from a narrowed central area, and in which a reflecting screen (4) is placed at a distance from, and to the rear of the conducting plate (1); a coaxial cable (5) is connected to the edges of the radiant slot (2), laying coplanarly or orthogonally to the plate (1).

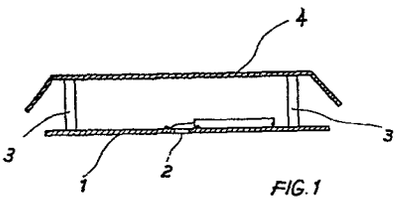

FIG. 1

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Radiant-slot television aerial, especially for indoor use

This invention concerns a radiant slot television aerial, especially for indoor use, suitable for connecting to a televisor by means of a coaxial cable.

The working principle of radiant slot aerials, in which the electromagnetic field is picked up by a slot made in a conducting surface, is known. Very few uses have been found for aerials based on the aforementioned principle in highly specialized sectors, however they have never been considered and they have never been used for picking up television signals, especially for aerials to be located directly in the environment in which the television set itself is situated, due to the fact that their characteristics depend strictly upon the frequency of the electromagnetic signal, thus proving to be wholly unsuitable for this specific sector.

From tests carried out, it was noted with surprise that the use of the radiant slot aerial principle in the television sector proved to be very interesting due to the fact that by using suitably shaped and suitably arranged slots, it is possible to obtain aerials with pre-established characteristics, irrespective of the frequency (constant gain, constant lobe aperture, etc.).

On the other hand, the use of a simple radiant slot plate would still not make it possible to obtain television aerials suitable for the intended purpose, as they are susceptible to numerous causes of interference and as they do not present any degree of directivity whatsoever.

This invention aims to overcome the aforementioned drawbacks and to use aerials based upon the radiant slot principle for picking up television signals.

According to the invention, a television aerial is thus provided, for indoor use, suitable for connection to a television set by means of a cable, characterized by the fact that it comprises in combination, a plate having an electrically conducting front surface provided with a radiant slot which symmetrically leads off from a narrowed central area, and a reflecting screen situated at a distance from, and to the rear of the aforesaid conducting plate.

Some embodiments of radiant slot television aerials will be described in detail hereunder, with reference to the accompanying schematic drawings, in which:

Fig. 1 shows a cross-sectional view of a radiant slot television aerial according to the invention;

Fig. 2 shows the frontal view of the conducting plate of the aerial of fig. 1, with one possible shape of the radiant slot;

Fig. 3 shows a view of a second conducting plate with an equiangular spiral slot;

Fig. 4 shows a third embodiment of the radiant slot plate.

With reference to figures 1 and 2, the indoor television aerial, according to the invention, substantially comprises a metal plate 1, or a plate having an electrically conducting front surface, provided with a radiant slot 2 of suitable shape or configuration. The conducting plate 1 is secured by means of insulating spacers 3, to a reflecting screen 4, situated at a distance from and to

the rear of the plate itself.

The conducting plate 1 may be made from any type of metal whatsoever, starting for example from sheet material, so as to obtain the entire plate with radiant slot in a single blanking operation, or by providing a plastic plate, the front surface of which has been suitably metalized, or made electrically conductive by the printed circuit technique. Likewise, the reflecting screen may be made of any suitable material and may be of any suitable shape; in the illustrated example, the screen 4 is flat in shape and parallel to the plate 1, with its lateral edges bent towards the plate itself, it may however present a convex configuration, or any other configuration suitable for the intended purpose. In any case, the shape of the screen and its arrangement with respect to the plate with radiant slot, should be achieved experimentally each time in order to find the best conditions for picking up the television signals.

As is shown in fig. 2, the radiant slot 2 presents a symmetrical shape with divergent edges which extend from both sides, leading off from a narrowed central area; in the case of fig. 2, the radiant slot 2 is substantially in the shape of two opposing coaxial diamonds, the edges of which are curved inwards. Whereas figure 3 shows a conducting plate 1 in which the radiant slot 2 is composed of two opposing spiral-shaped parts or which follow one another starting from a central narrowed section; here again, the spiral slots have edges which diverge or which widen out progressively and then narrow towards the ends. Excellent results are achieved by giving the slot a substantially similar configuration to that of an equiangular spiral or Archimedean spiral,

as shown.

Lastly, fig. 4 shows a third example of a plate 1 with radiant slot 2, in which the slot is substantially composed of two opposing triangular shapes joined at the top.

In all the examples shown, a coaxial cable 5, for connecting the aerial to a television set, is connected to the opposing edges of the radiant slot 2, in correspondence with the narrower central area; in order to avoid noises in the television signal and in order to optimize the performance of the television aerial thus achieved, the cable 5 must be arranged in such a way that it never ever crosses over the area of the plate containing the radiant slot 2. The cable 5 must therefore be placed to the rear of, and coplanar to the plate itself, leading off tangentially or orthogonally to the axis of the slot 2, or can be arranged orthogonally to the plane of the plate itself.

The entire unit composed of the plate 1 with radiant slot and the reflecting screen 4 can be mounted on any type of fixed or pivotable support, according to the circumstances, without this constituting a limitation of this invention.

Claims

1. Indoor television aerial, suitable for connecting, by means of a cable (5), to a televisor, characterized by the fact that it comprises in combination, a plate (1) having an electrically conducting front surface, with a radiant slot (2), and a reflecting screen (4) placed at a distance from and to the rear of the aforementioned plate (1).

2. Aerial as claimed in claim 1, characterized by the fact that the radiant slot (2) presents diverging lateral edges which extend symmetrically from a narrower central portion.

3. Aerial as claimed in claim 1, characterized by the fact that the conducting cable (5) is arranged coplanar to the plate (1) laying tangentially or orthogonally to one side of the radiant slot (2).

4. Aerial as claimed in claim 1, characterized by the fact that the cable (5) connected to the radiant slot (2) is arranged orthogonally to the plane of the plate (1).

5. Aerial as claimed in claim 1, characterized by the fact that the plate (1) with the radiant slot (2) is made of blanked metal sheet.

6. Aerial as claimed in claim 1, characterized by the fact that the plate (1) with the radiant slot (2) is made of a sheet of supporting material, the front surface of which has been made electrically conductive.

7. Aerial as claimed in claim 1, characterized by the fact that the radiant slot (2) comprises opposing spiral-shaped parts.

8. Aerial as claimed in claim 7, characterized by the fact that said spiral parts of the radiant slot (2) are delimited by edges which diverge progressively in the form of an equiangular spiral, tapering towards the ends.

9. Aerial as claimed in claim 1, characterized by the fact that the radiant slot (2) consists of two opposing coaxial diamonds, the edges of which are curved inwards.

10. Aerial as claimed in claim 1, characterized by the fact that the radiant slot (2) consists of two opposing triangular-shaped parts, joined at the top.

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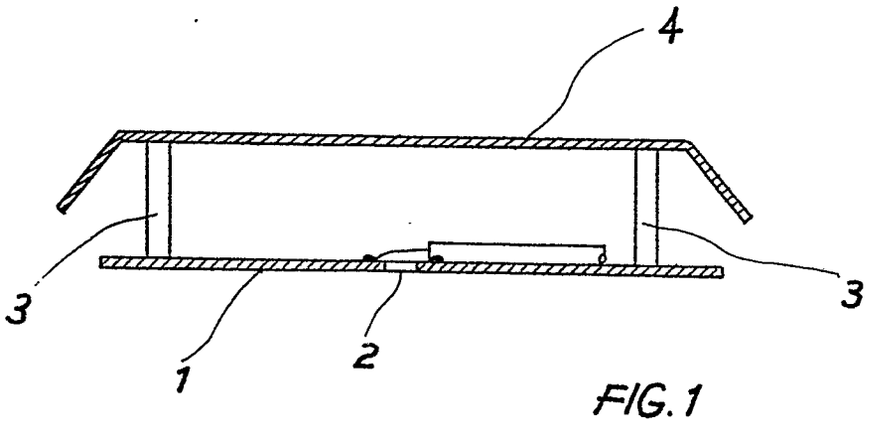

FIG. 1

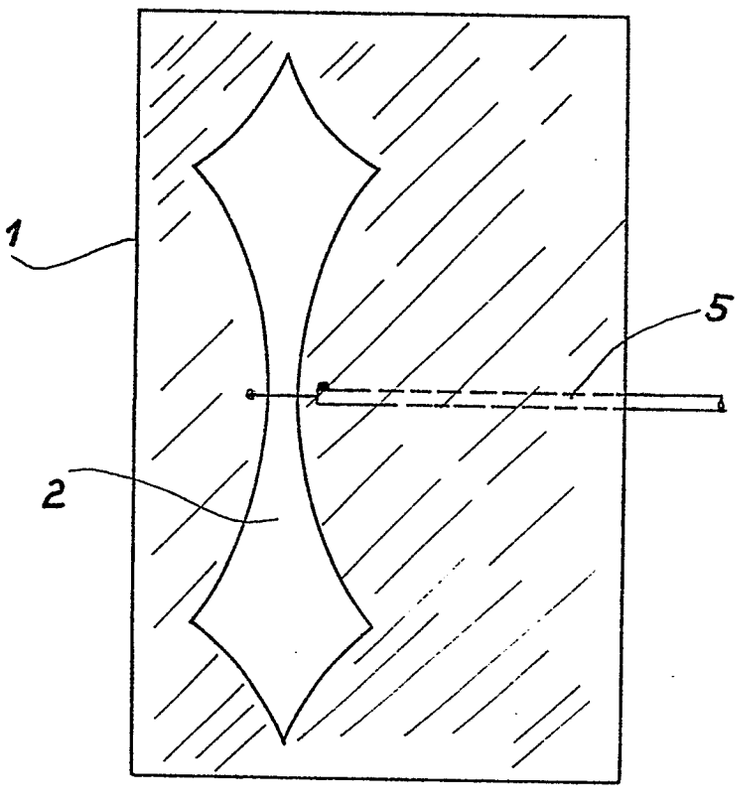

FIG.2

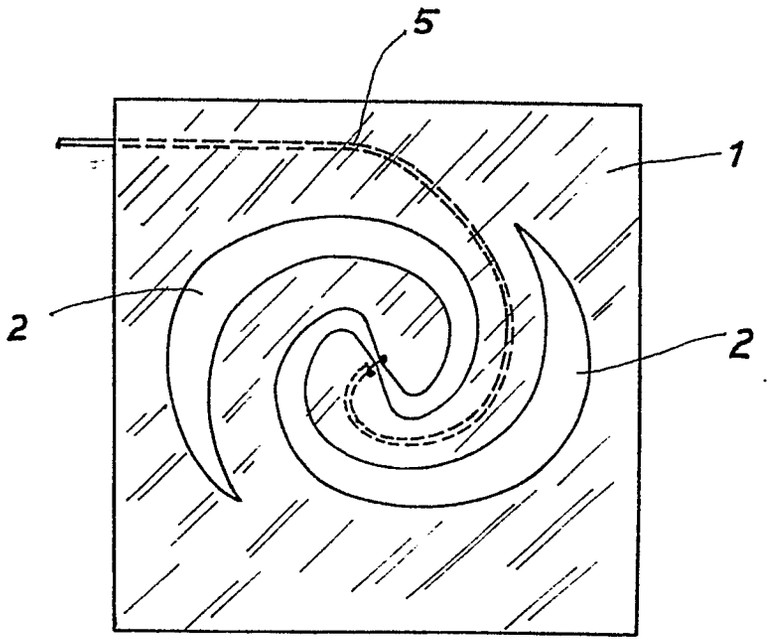

FIG. 3

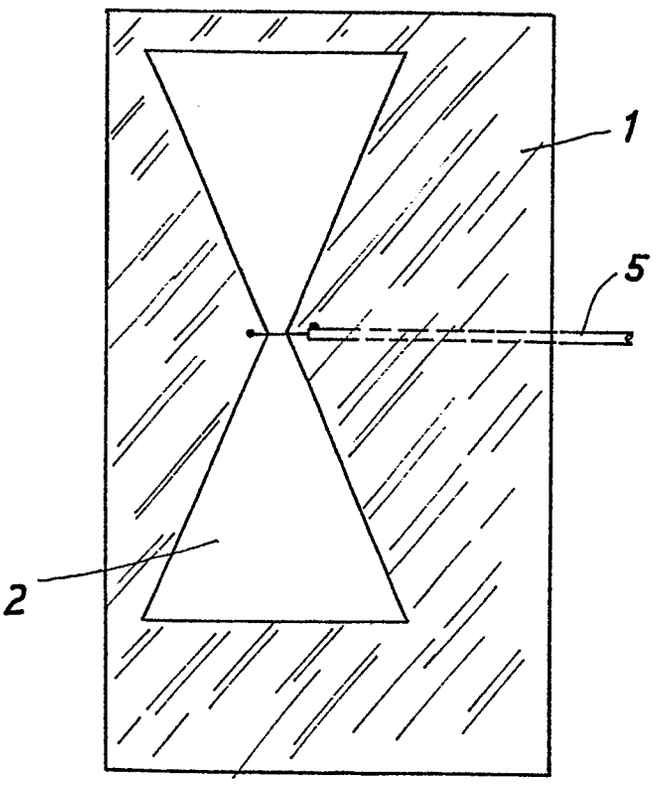

FIG. 4

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EUROPEAN SEARCH REPORT

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Application number

EP 83 10 1493

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	US-A-3 031 665 (G.R.-P. MARIE) * Figures 1, 2 *	1	H 01 Q 13/10
A	DE-C-1 028 632 (CIE FRANCAISE THOMSON-HOUSTON) * Figure 3 *	2	
A	US-A-4 222 056 (J.H. GRAESER et al.) * Figure 1 *	3	
A	FR-A-2 462 030 (DIELA) * Figures 1, 3 *	1,3,5, 6	
A	US-A-2 605 411 (H.J. RIBLET) * Figure 1 *	4	TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
A	US-A-3 638 226 (C.G. BROOKS et al.) * Figure 2 *	7	H 01 Q 13/10 H 01 Q 1/24
A	US-A-3 509 465 (S.N. ANDRE et al.) * Column 3, lines 8-15 *	8	
A	US-A-2 935 747 (R.N. GHOSE) * Figure 1 *	10	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	09-05-1983	BREUSING J

CATEGORY OF CITED DOCUMENTS

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