(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 006 607 A2

# (12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
**07.06.2000 Bulletin 2000/23**

(51) Int Cl.[7]: **H01Q 1/24**, H01Q 1/42

(21) Application number: **99400790.4**

(22) Date of filing: **31.03.1999**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE**
Designated Extension States:
**AL LT LV MK RO SI**

(30) Priority: **03.12.1998 CN 98249216**

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## (54) Low-noise block-down receiver with an improved housing structure

(57) A low-noise block-down receiver (LNB) with an improved housing structure according to the invention is disclosed. The low-noise block-down receiver includes a signal processing circuit and a housing which is used to contain the processing circuit and functions as a horn and a wave guide. The housing is made of plastic material and has an inner surface plated with a metal plating film which has a better electric conductivity and is suitable for conducting microwave. Thus, the housing can efficiently conduct microwaves and prevent both signal leakage and outside noise interference. The low-noise block-down receiver has an improved housing structure instead of the conventional aluminum alloy or other metal alloy-made housing, which can withstand impact and corrosion, and has a low manufacturing cost.

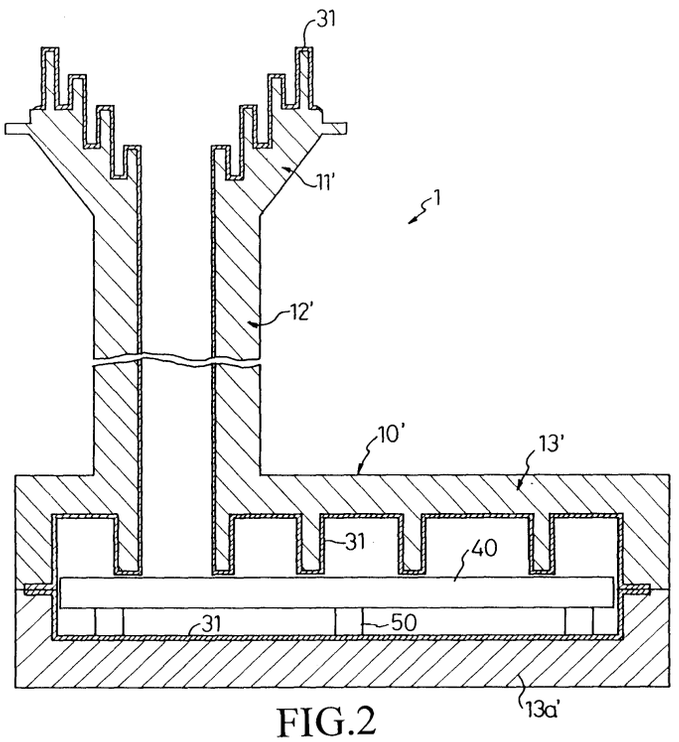


FIG.2

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## Description

### BACKGROUND OF THE INVENTION

1. Field of the Invention

**[0001]** The invention relates to a low-noise block-down receiver (LNB), and more particularly to a low-noise block-down receiver with an improved housing structure which has a low manufacturing cost.

2. Description of the Related Art

**[0002]** Basically, a satellite TV signal is transmitted to, for example, a TV, by a number of means, such as a horn, a wave guide, an orthogonal mode converter and a low-noise processing circuit. However, these means are separated from each other. Therefore, it is inconvenient to use them and a higher manufacturing cost is encountered. In order to resolve these problems, a low-noise block-down receiver (LNB) shown in Fig. 1 is introduced. The low-noise block-down receiver includes a processing circuit (not shown), a signal output connector 14, a horn 11 for collecting microwave electromagnetic radiation, a wave guide 12 connected to the horn 11 and a container 13 connected to the wave guide 12 for containing the processing circuit and avoiding microwave leakage and/or outside noise interference. Furthermore, the horn 11, the wave guide 12 and the container 13 are formed into an one-shape metal housing. Additionally, in order to protect the metal housing from corrosion caused by outside harsh climate, a housing made of plastic 20, which includes two parts 20a and 20b, and is designed to enclose the metal housing. In general, a plastic cover is used to shield a signal inlet just above the horn 11.

**[0003]** However, during the manufacturing process for the above-stated LNB, molds for the metal and plastic housings must be individually prepared. Moreover, during assembly, the processing circuit has to be first disposed in the metal housing, and then the plastic housing is used to enclose the metal housing. In order to reduce the cost and to simplify the structure of the LNB, it is desirable to develop a low-noise block-down receiver with a simple structure, a low manufacturing cost and one that requires less material for construction.

### SUMMARY OF THE INVENTION

**[0004]** In view of the above, an object of the invention is to provide a low-noise block-down receiver which has a simple structure and can greatly reduce manufacturing costs.

**[0005]** To achieve the above-stated object, the low-noise block-down receiver includes a signal processing circuit and a housing which is used to contain the processing circuit and functions as a horn and a wave guide, and is characterized in that the housing is made of plastic material and its inner surface is plated with a metal plating film which can conduct microwave and prevent both signal leakage and outside noise interference.

**[0006]** Due to cost saved for molds, assembly and manufacturing materials, the entire manufacturing cost can be greatly reduced. Moreover, the plastic housing is easily changed and controlled so that no gap exists between the metal film and the plastic housing. Therefore, not only can the plastic housing be further strengthened to reduce damage to itself, but also the variable shape, small size and light weight of the plastic housing can meet requirements for different spaces.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0007]** The invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus do not limit the present invention, and wherein:

Fig. 1 is a schematic, side view showing portions of a conventional low-noise block-down receiver;

Fig. 2 is a schematic, cross-sectional view showing a low-noise block-down receiver according to a preferred embodiment of the invention; and

Fig. 3 is a schematic, perspective view showing a socket for the signal output of a low-noise block-down receiver according to a preferred embodiment of the invention.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

**[0008]** Fig. 2 is a schematic, cross-sectional view showing a low-noise block-down receiver (LNB) according to a preferred embodiment of the invention. Referring to Fig. 2, the LNB 1 includes a signal processing circuit 40, a horn 11', a wave guide 12' and a container 13' which is used to contain and enclose the processing circuit 40. The horn 11', the wave guide 12' and the container 13' are formed to one shape and with plastic material, such as ABS, considered a plastic housing 10'. The inner surface of the plastic housing 10' is plated with a metal film 31, such as a copper-nickel alloy, a copper-silver alloy or a copper-gold alloy. To facilitate assembly, the container 13' has a bottom cover 13a' which is used to seal the container 13' after the low-noise signal processing circuit 40 is disposed therein, thereby preventing outside noise interference. Moreover, to prevent short circuit, there is a spacer 50 installed between the processing circuit 40 and the bottom cover 13a'.

**[0009]** Fig. 3 is a schematic, perspective view showing a socket 14' located on the container 13' for the signal output of a LNB according to a preferred embodi-

ment of the invention. The socket 14' has an inner spiral toothed structure plated with a metal film (not shown) or formed together with the socket 14' in one shape. Furthermore, a signal output connector (not shown) similar to that shown in Fig. 1 is inserted into the socket 14'. The output terminal of the output connector is electrically connected to the processing unit 40, for transmitting a processed signal to, for example, a TV.

**[0010]** Basically, the metal film 31 can be formed by any known plating method. In addition, constant amounts of an anti-ultraviolet agent and an anti-oxidization agent previously filled the inside of the plastic housing 10'. Then, the plastic housing was plated with the metal film 31 (such as a copper-nickel film with an optional composition) which can conduct microwaves, and preferably has a conductivity of below 2 ohms/in$^2$ so as to meet requirements for high-frequency microwave protocol.

**[0011]** In a LNB based on the invention, since it is unnecessary to manufacture a metal housing, and the metal plating film can be speedily and mass produced, manufacturing costs are greatly reduced. Moreover, the plastic housing can withstand impact and corrosion, and has greater strength. Therefore, a low-noise block-down receiver having a simple structure and a low cost can be obtained.

**[0012]** While the invention has been described by way of example and in terms of the preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, it is intended to cover various modifications and similar arrangements as would be apparent to those skilled in the art. Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

## Claims

1. A low-noise block-down receiver with an improved housing structure which comprises a signal processing circuit and a housing which is used to contain the processing circuit and functions as horn and wave guide, being characterized in that:
   the housing is made of plastic material and has an inner surface plated with a metal plating film which can conduct microwave and prevent both signal leakage and outside noise interference.

2. The receiver as claimed in claim 1, wherein the metal film is an electrically conductive alloy.

3. The receiver as claimed in claim 1, wherein the output signal of the processing circuit is output from a connector which is plugged in a socket provided in the housing, and the surface of the socket is plated with a metal film.

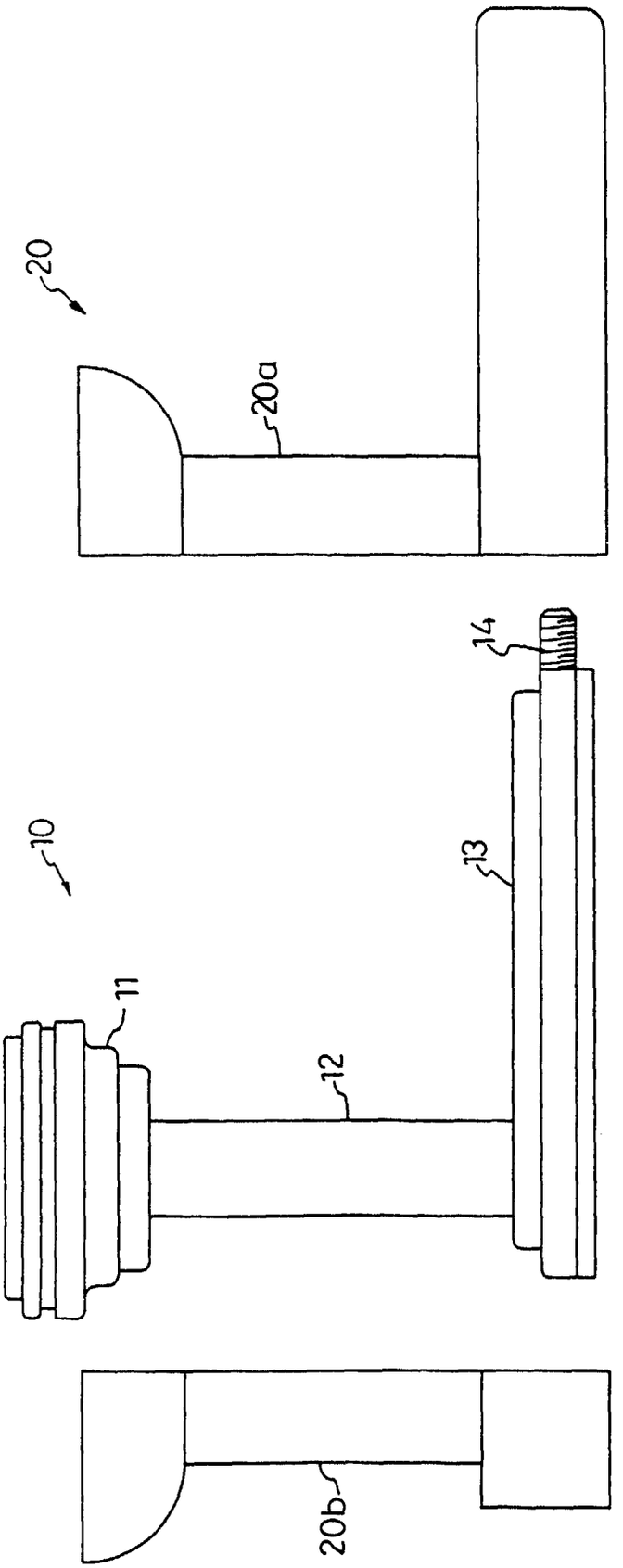


FIG.1

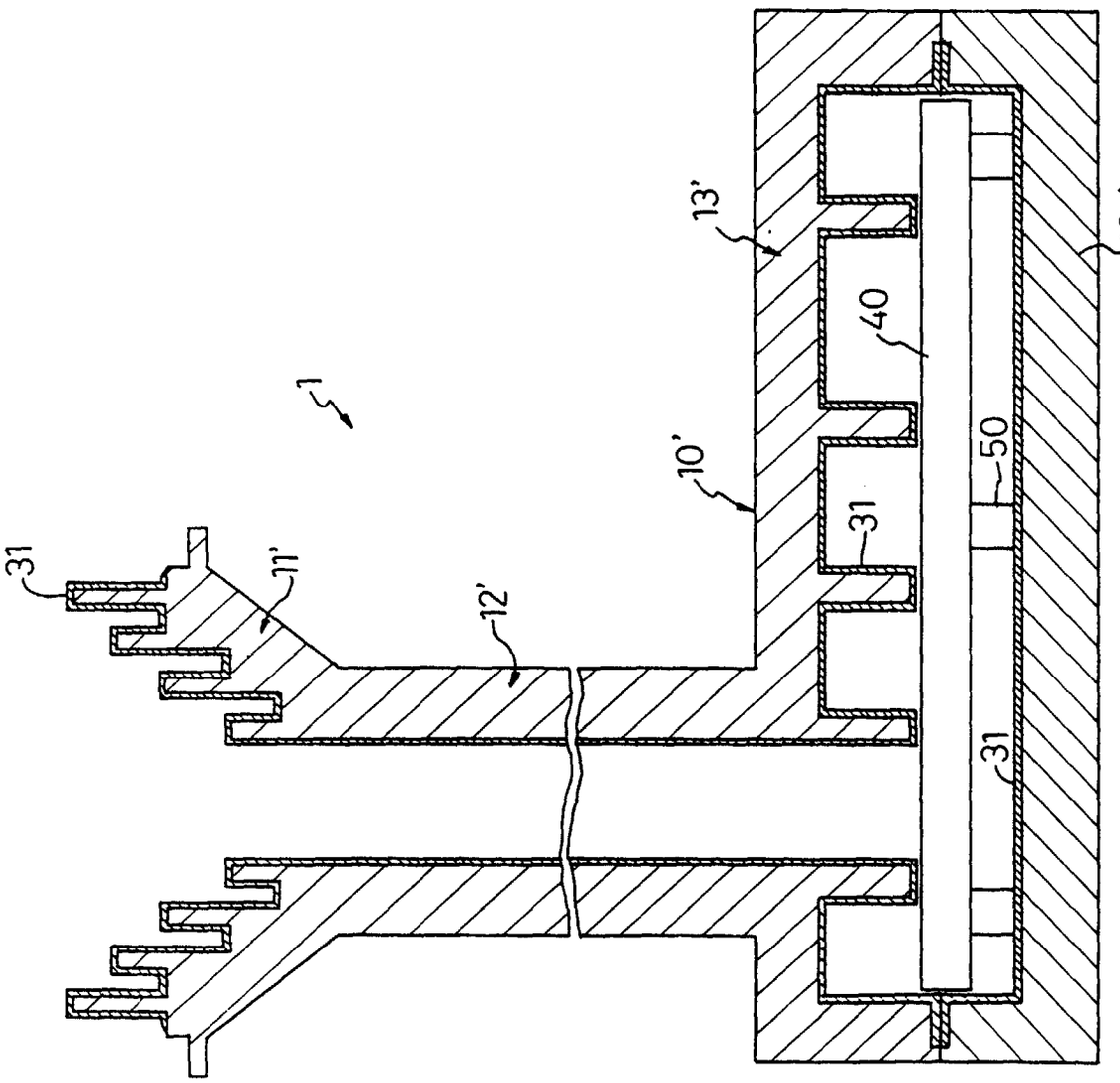


FIG.2

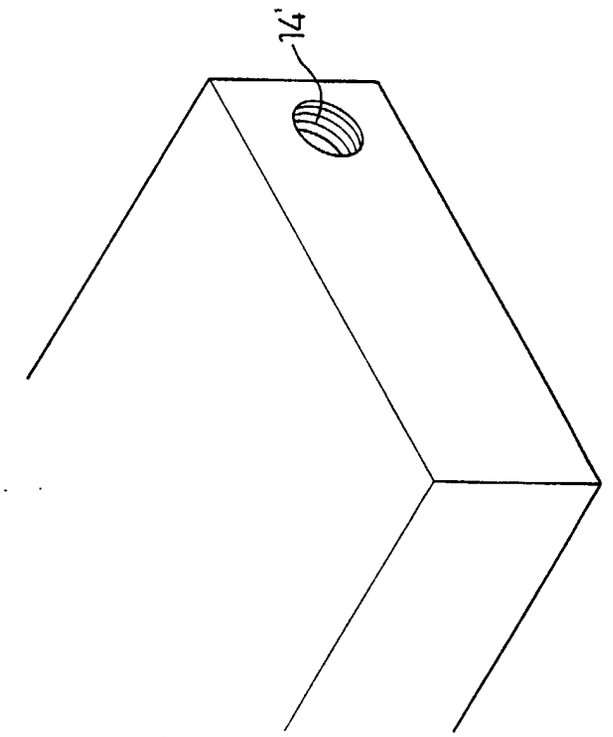


FIG.3