United States Patent

[11] **3,575,370**

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[21] Appl. No. **854,056**
[22] Filed **Aug. 29, 1969**
[45] Patented **Apr. 20, 1971**
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[54] **SNAP-IN MOUNTING FOR LOUDSPEAKERS AND THE LIKE**
2 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **248/201,** 24/73, 85/5, 248/27, 248/225
[51] **Int. Cl.** **F16b 19/00**
[50] **Field of Search** ..... 248/225, 223, 27, 201; 339/126; 85/5; 24/73.8 (P), 73 (PF)

[56] **References Cited**

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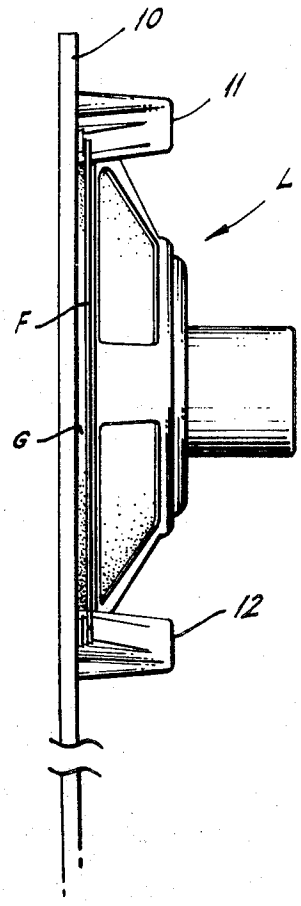
ABSTRACT: A mounting device, particularly for use in a radio cabinet. A loudspeaker is fastened to a support panel by specially serrated spring fingers, which allow easy and accurate snapping-in of speakers having gaskets of different thickness.



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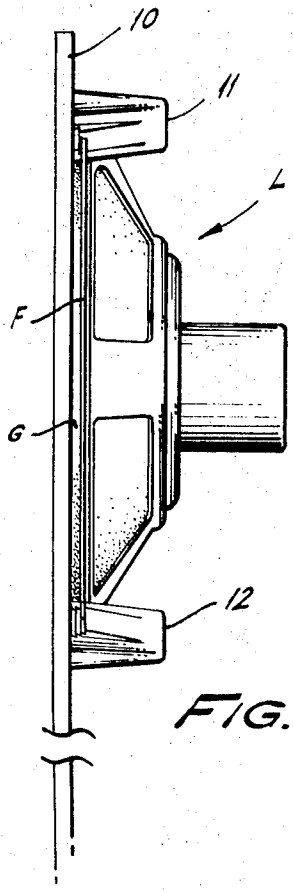

FIG. 1.

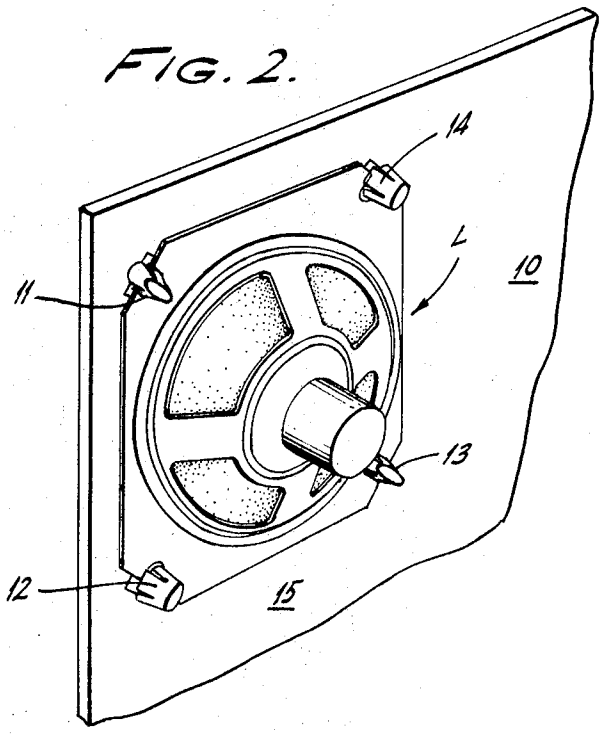

FIG. 2.

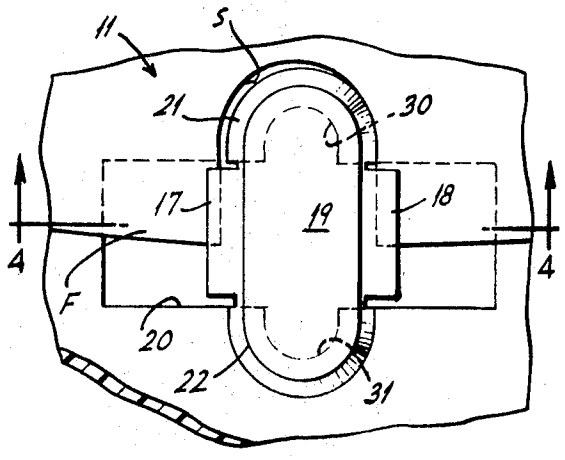

FIG. 3.

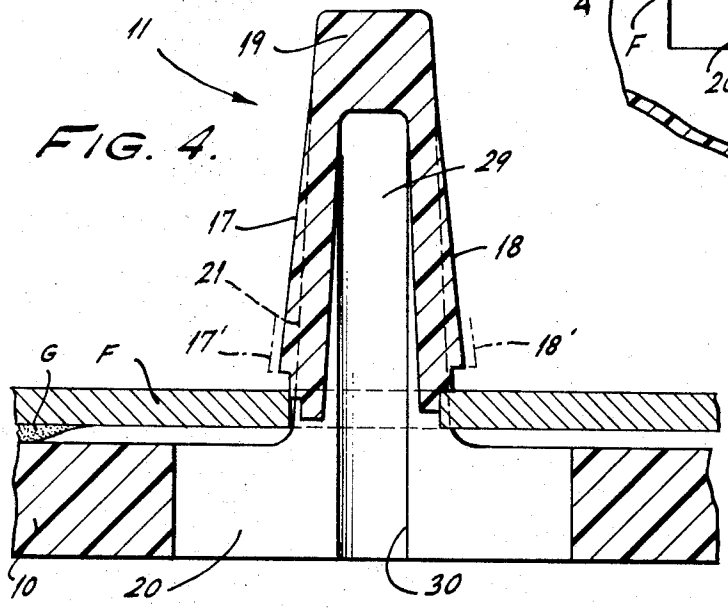

FIG. 4.

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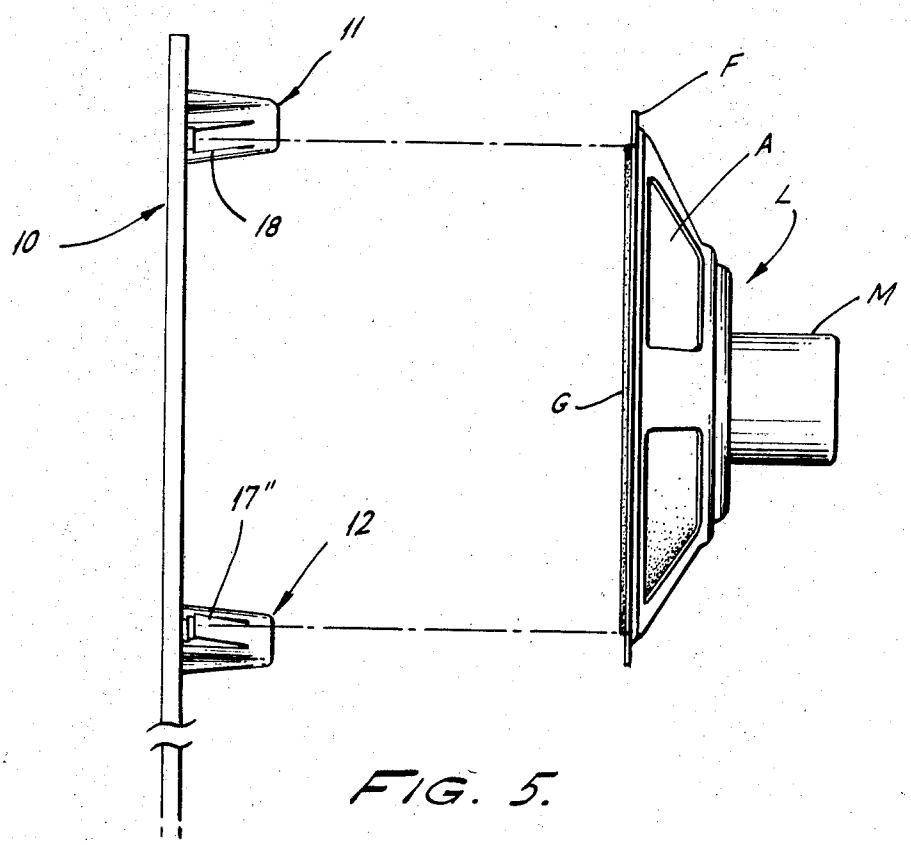

FIG. 5.

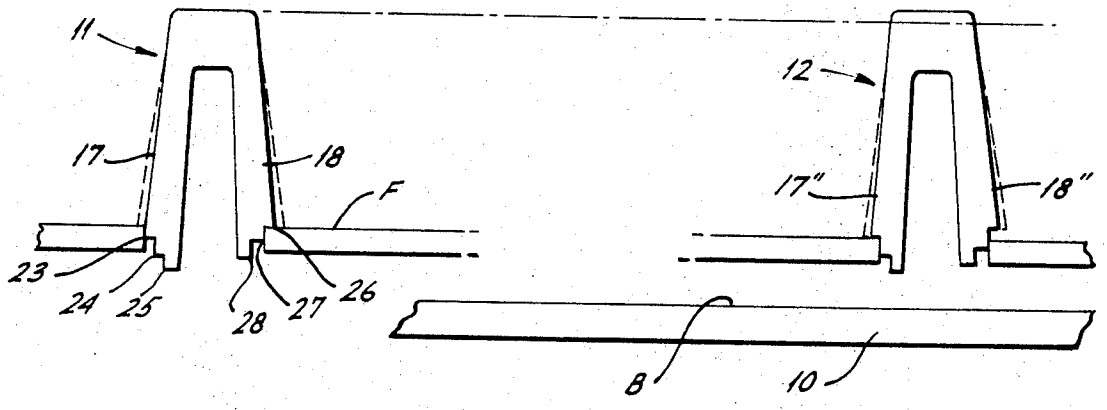

FIG. 6.

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SNAP-IN MOUNTING FOR LOUDSPEAKERS AND THE LIKE

BACKGROUND

Heretofore loudspeakers were fastened by a variety of mounting structures or small pieces of hardware, which introduced complexity, mainly when the speakers had gaskets of different thickness and when support panels were warped.

NATURE OF THE INVENTION

The mounting panel is provided with several fasteners, advantageously integral therewith. In a preferred embodiment of the invention each fastener includes a pair of fingers for resilient engagement with the loudspeaker frame. The fingers are serrated in lower outside portions thereof, for holding edge portions of the speaker frame. According to the invention the serrations on the two fingers of each pair are formed in mutually staggered locations, differently spaced from the supporting panel. This arrangement allows easy and proper snapping-in of speakers, even when the speakers have peripheral gaskets of substantially different thickness, or when the mounting panel is warped.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side view, and FIG. 2 a perspective rear view, of an embodiment of the invention. FIG. 3 is an enlarged plan view of a detail from FIG. 2. FIG. 4 is a section through the structure of FIG. 3, taken along line 4–4.

FIG. 5 is a side view similar to FIG. 1 but showing the panel and speaker disassembled. FIG. 6 is a diagram schematically showing the relationship between the mentioned serrations, with respect to their relative elevations.

DETAILED DESCRIPTION OF THE INVENTION

Referring first to FIGS. 1 and 2, panel 10 is arranged to support loudspeaker L. The panel, which can be made from synthetic plastic material, has a series of fasteners 11, 12, 13, 14 integrally formed on its rear surface, which normally is located within the radio cabinet (not shown). The general positioning of these fasteners on the panel is such as to match the approximate locations and sizes of mounting apertures or slots S of loudspeaker frame F (FIG. 3). The set of fasteners (FIG. 2) can be located in a corner of a panel 10 forming part of the cabinet for a broadcast receiver of the radio or television type, while other panel areas 15 can be used in connection with other elements of the receiver, not shown herein. Instead of the speaker shown here, other radio elements comprising a rigid frame can be mounted by fasteners of the type disclosed herein. In the illustrated arrangement, a region of panel 10 central to the system of fasteners provides an aperture for passing the sound, produced by acoustic membrane A of speaker L under the control of speaker magnet M (FIG. 5). Membrane A has the usual peripheral gasket G.

Each fastening unit, for example unit 11 as shown in FIGS. 3 and 4, has a pair of mutually spaced, speaker engaging fingers 17, 18, depending from a bridge 19 which extends across an aperture 20 in panel 10. The bridge is supported by a pair of posts 21, 22 integral with the panel, these posts being formed as upwardly tapering half cylinders, on opposite sides of aperture 20. They extend from the rear surface of the panel in directions generally normal thereto. The panel, posts and bridge advantageously are integral and rigid, whereas fingers 17, 18 and gasket G are resilient. The rigid fastener portions 10, 21/22, 19 and the resilient fingers 17/18 thereon are provided by suitable dimensioning of the plastic material, of which the entire panel and fastener structure consists. The required techniques are known to persons skilled in the art.

The finger structure, which resiliently depends from the supporting bridge, has a normal outer profile of downwardly-outwardly flaring configuration, as is suggested by broken lines 17′, 18′ (FIG. 4). The finger structure is resiliently compressed when it is engaged by a relatively narrow slot S of frame F (FIG. 3), that is, when the frame is moved onto the fastener and finger structure in a direction normal to the panel (see the broken lines in FIG. 5), in order to mount the speaker on the panel.

Upon such motion, the slots in the speaker frame ultimately engage outside areas of the free ends of fingers 17, 18, which are specially serrated in accordance with the invention (FIG. 6). We show successively lower edges 23, 24, 25 on the tip of finger 17, and generally similar serrations 26, 27, 28 on finger 18. The indentations are shown as spaced from a common reference plane—a flat back surface B of panel 10—by distances which differ from one finger to the other finger of each pair. The difference is indicated as a fraction of the width of one serration. Due to this staggering of serrations, some and only some of the potentially frame engaging serrations on each fastener engage loudspeaker frame F by snapping over the adjacent edges of this frame when the loudspeaker is brought onto the panel. For example, frame F is shown in FIG. 6 as engaged by upper edge 26 of finer 18 but not engaged by any of the edges of finger 17 on fastener 11, although both fingers are resiliently deflected by the frame.

A slightly different form of engagement is shown with respect to fastener 12, where the uppermost serrated edge of finger 17″ and a lower serration surface of finger 18″ engage the frame. As shown in the drawing, this difference is due to the fact that fastener 12 is not exactly aligned with fastener 11 (see the broken horizontal line). Such misalignment can be caused by warping of panel 10 or of frame F. Also, even if fasteners 11 and 12 are aligned, portions of frame F may be spaced at nonuniform distances from surface B due to variations in thickness of the gasket. By means of the new, staggered arrangement of serrations the snapping-in of the speaker becomes easy even if the speakers have gaskets of different thickness, or of a thickness which varies from place to place on one and the same speaker, or if panels or frames are warped.

The resilient fingers of the new structure, complete with their specially staggered serrations, can be formed by well-known methods of producing apparatus of plastic material, for example by molding and forming procedures wherein the panel, posts, bridge and fingers are formed in a single operation. The forming process usually entails the use of a forming die element or tool, providing the aforementioned spacing 29 between fingers 17, 18 (FIG. 4). Such a die can be inserted through aperture 20. Its insertion and use is additionally facilitated by lateral extensions 30, 31 of said aperture, within posts 21, 22, as will be understood upon a review of FIGS. 3 and 4. Additional dies are used to form the outside surfaces of the fasteners and the serrations on the fingers. The width of the serrations on each finger, formed in accordance with this invention, can be, for example, of the order of about one thirty-second inch, and the difference of their spacing from the panel, about one sixty-fourth inch. A finger can be about three-eighths inch long. The entire fastener structure, including support post and bridge, may extend about five-eights inch from the support panel. Of course these dimensions are merely illustrative.

In order to fasten speaker frame F on support panel 10 (FIG. 5), it is sufficient to bring the speaker onto panel 10, with the hollow side of speaker membrane A forward and facing the panel aperture. The speaker frame then compresses each fastener, by squeezing the two fingers thereof between two sides of one slot in this frame, while gasket G is compressed between frame F and panel 10. The fingers of fastener 11 are squeezed between two sides of one slot. This part of the operation can be substantially the same for all fasteners. Importantly, only one of the two resilient fingers of each fastener is generally snapped onto the frame, that is, caused to have one or more of its serrations spring back over the surface of the frame. The fastening of the speaker is complete when three or four fingers, on three or four

fasteners, have been caused to spring back or snap in. The speaker then resists an attempt to remove it from the panel by simply pulling it away.

It is a matter of indifference which are the exact fingers, or serrations, as to which this snapping-in takes place. Depending on the actual form and dimensions of speaker gasket G (FIG. 4) and also depending on any irregularities or warping in frame F or panel **10**, the speaker finds its proper place relative to the panel. The snapping-in can be done in a moment. Adequate pressure on the speaker gasket is automatically established, even if the dimensions and proportions of the several parts be somewhat irregular.

In order to remove the speaker from the panel it is sufficient to squeeze the frame-holding fingers together. This can be done manually on successive fasteners, engaging the frame. The user can then tilt the frame away from the plate. No special tools are needed. It is simple to reinstall the same speaker or to install speakers having gaskets of different thickness, by repeating the rapid and effective snap-in procedure which we have described.

It will be evident from the foregoing description that the invention can be embodied in a variety of specific forms, and with different numbers and distributions of resilient fingers and of serrations thereon.

We claim:

1. Apparatus for use in a broadcast receiver, comprising: a panel; a plurality of fastener structures integrally formed on a surface of said panel and extending away from said surface; a plurality of resilient fingers extending from each fastener structure to the panel, each finger having indentations formed terminally thereon; and a loudspeaker engaged by such indentations to secure it to said fastener structure, said loudspeaker having slots in its frame, located and dimensioned to match the locations of the fastener structures on said panel and resiliently to deflect the fingers when the loudspeaker is mounted on the panel; the spacing of such indentations from said panel being different on one finger of a fastener from the spacing of such indentations on another finger of the same fastener.

2. Mounting apparatus, comprising: a panel; a plurality of fastener structures on a surface of said panel and extending away from said surface; a plurality of resilient fingers extending from each fastener structure to the panel, each finger having indentations formed terminally thereon; and a component mounting frame engaged by such indentations to secure it to such fastener structure, said frame having slots located and dimensioned to match the locations of the fastener structures on said panel and resiliently to deflect the fingers when the frame is mounted on the panel; the spacing of such indentations from said panel being different on one finger of a fastener from the spacing of such indentations on another finger of the same fastener.