April 27, 1965 R. S. HUFF ETAL 3,180,447

CABINET FOR SOUND REPRODUCING EQUIPMENT

Original Filed March 26, 1959

FIG. 1

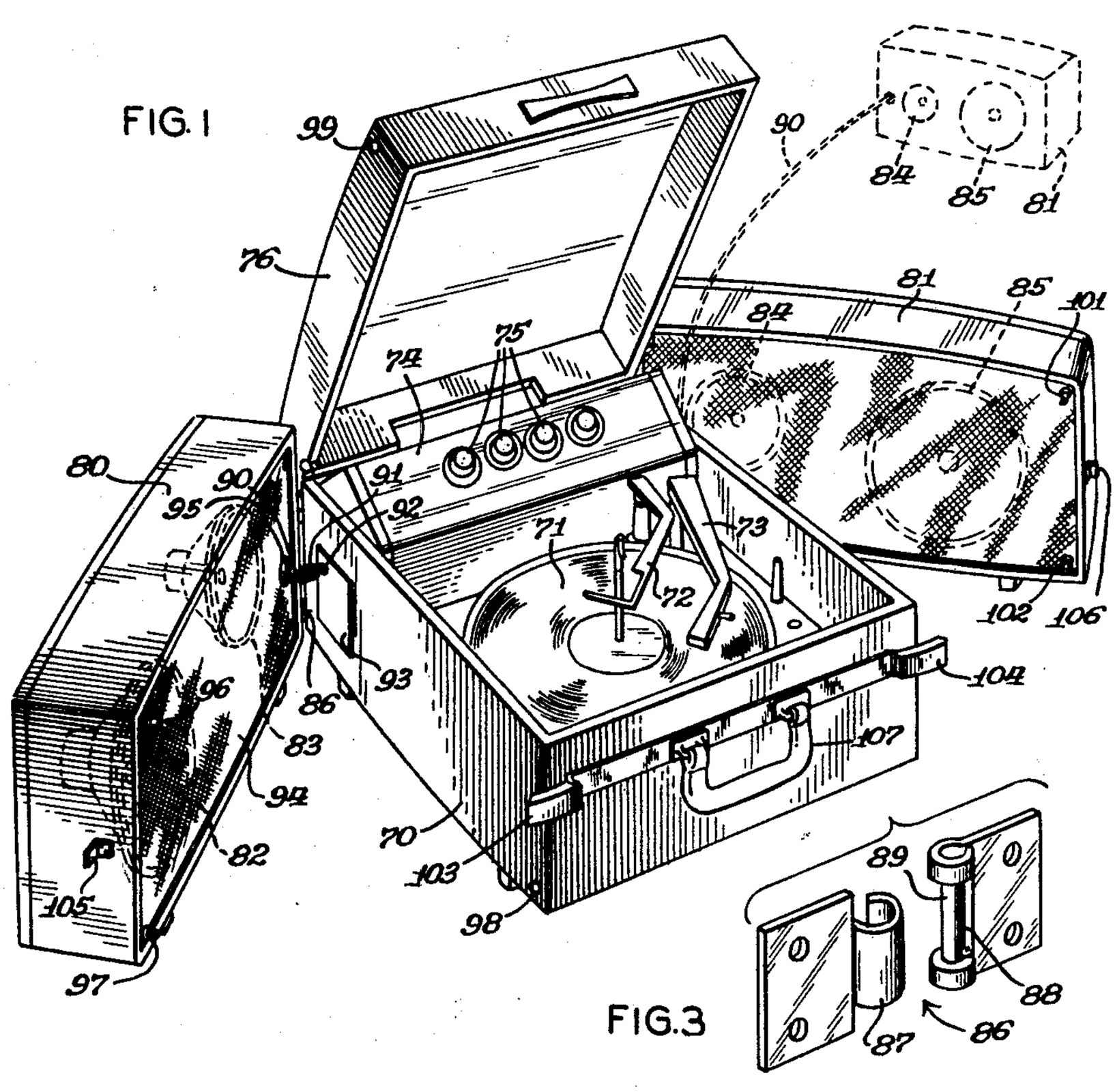
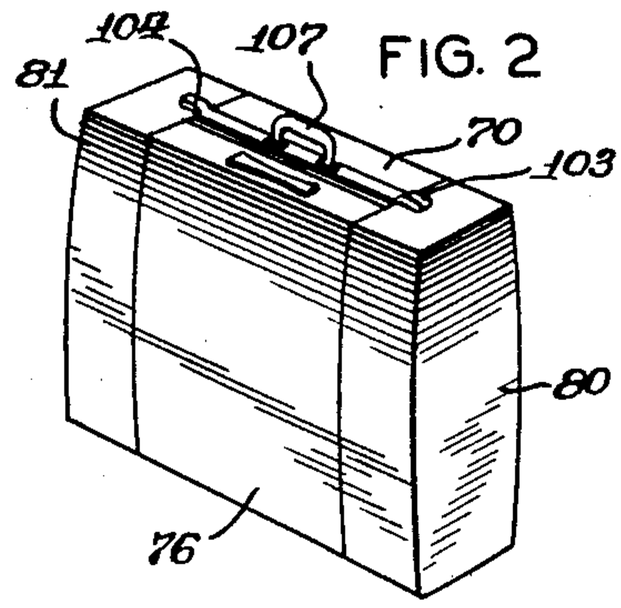


FIG. 3

FIG. 2



INVENTORS.
Robert S. Huff
Joseph Horzick
By
Mueller & Aichele
Atty's

United States Patent Office

3,180,447

Patented Apr. 27, 1965

3,180,447
CABINET FOR SOUND REPRODUCING EQUIPMENT

Robert S. Huff, Oak Park, and Joseph Horzick, West Chicago, Ill., assignors to Motorola, Inc., Chicago, Ill., a corporation of Illinois

Original application Mar. 26, 1959, Ser. No. 802,146, now Patent No. 3,090,462, dated May 21, 1963. Divided and this application Jan. 21, 1963, Ser. No. 252,676

1 Claim. (Cl. 181—31)

This invention relates to cabinets for housing electronic equipment, and more particularly to improvements in cabinets for housing electro-acoustical devices for reproducing stereophonic sound. This application is a division of application Serial No. 802,146, filed March 26, 1959, now U. S. Patent No. 3,090,462.

Proper reproduction of stereophonic sound depends upon several factors including correctly matched equipment, correct operation and adjustment thereof and correct arrangement of the separate channel loudspeaker systems. The positioning of the speaker systems presents a difficult problem since at least some of the speakers for the separate channels should preferably be spaced a substantial distance from each other and should be adjustable so that they can be positioned to provide the best stereo effect.

Present day one piece table or portable cabinets such as are in popular use for standard and hi-fidelity monophonic sound reproduction equipment, do not have the optimum physical arrangement required for correct reproduction of stereophonic sound. Since such a cabinet arrangement is preferred by many people over systems housed in a multiplicity of separate cabinets, it is desirable to provide a single cabinet combination for housing stereophonic equipment constructed so as to overcome these problems.

It is therefore an object of this invention to provide an improved cabinet arrangement for housing stereophonic sound reproducing equipment.

A further object is to provide a cabinet for housing electronic equipment having sound reproducing speakers whereby enclosing means for the speakers may be easily opened and/or removed from the cabinet proper, may be operated adjacent to or at a distance therefrom, and may be received in the cabinet when the equipment is not in use to blend harmoniously therewith.

Another object of this invention is to provide a cabinet having enclosing means for speaker systems which are mounted to permit swinging movement from a closed integrated position to open spaced operational positions, thereby allowing a number of different relative positions of the enclosing means.

A still further object of this invention is to provide a cabinet for housing stereophonic sound reproducing equipment which when closed forms a structure of a size and shape to permit carrying by hand, and when opened permits spaced positioning of sound reproducing means for proper stereophonic operation.

A feature of this invention is the provision in a cabinet for housing sound reproduction equipment of separate speaker enclosures pivotally mounted on the cabinet so that they may be easily swung from a closed non-operating position to an open playing position.

Another feature of this invention is the provision of a cabinet for stereophonic sound equipment having detachable hinge-mounted speaker enclosures with provisions for extensible electrical connections to the cabinet equipment so that they may be operated both when attached to the cabinet and when placed at a distance from the cabinet.

A further feature of the invention is the provision of

a cabinet having a main or central portion having surfaces shaped to symmetrically receive at least two speaker enclosures thereon, the speaker enclosures being shaped to mate therewith to enclose said surfaces and to form a compact and harmonious cabinet configuration when the speakers are attached thereto in their closed position.

In the accompanying drawings:

FIG. 1 is a perspective view of a portable cabinet with two speaker enclosures shown in opened position;

FIG. 2 is a perspective view illustrating the portable cabinet of FIG. 1 in carrying position; and

FIG. 3 is an exploded perspective view illustrating in detail the hinge structure in FIG. 1.

A table or portable cabinet constructed in accordance with the present invention includes a central or main portion adapted to house electronic equipment. Two smaller enclosures for supporting and housing electro-acoustical devices are mounted on the central portion of the cabinet. These enclosures are constructed to match the configuration of the central portion of the cabinet so that an integrated and unitary cabinet embodiment of the entire sound reproduction system is presented by the central cabinet portion and the enclosures. The enclosures may be pivotally mounted to serve as door-like portions so that various angular positions are readily obtained by merely pivoting one or both enclosures without removing them from the cabinet. They are usually symmetrically located on the central portion, and are automatically spaced from each other by the central portion when pivoted to their operating position. The hinges may include disengageable parts so that the enclosures may be removed from the cabinet. Extensible electrical connections may be provided to allow placement and operation of the enclosures at various locations spaced from the cabinet.

A portable cabinet housing equipment for reproducing stereophonic sound is shown in FIGS. 1 and 2. A box shaped center portion **70** houses a record changing and playing mechanism including turntable **71**, record support arm **72** and tone arm **73**. It is apparent that a simple stereophonic record player or tape playing apparatus may be substituted for the record changing mechanism. A control panel **74** supporting control knobs **75** is located at the rear of the center portion **70** and controls amplifying and other electronic equipment. A hinged compartment lid **76**, shown in an upright open position in FIG. 1, can be swung down to a closed position to completely cover the center portion **70**.

Speaker enclosures **80** and **81** are provided on the left and right of the center portion **70** of the portable cabinet. Enclosure **80** provides a housing for left audio channel speakers **82** and **83**. Similarly, enclosure **81** provides a housing for right audio channel speakers **84** and **85**. Enclosure **80** is pivotally mounted at the rear of the center portion **70** by hinges as generally indicated at **86**, which may be standard break-apart hinges such as the **C**-type hinge best shown in the exploded perspective view of FIG. 3. Enclosure **81** is also hinge mounted at the rear of the right side of the center portion **70** by similar hinging means.

As shown in FIG. 3, the **C**-type hinge **86** includes a male portion having a curved prong **87** and a flat surface adapted for mounting on the rear side of enclosure **80**. The mating hinge part has a slot **88** and a post **89** to receive the prong **87**. This allows the enclosure **80** to pivot away from the center portion **70**. When the prong **87** is fully withdrawn from the slot **88** the enclosure **80** is free of the cabinet. Thus fastening, pivoting and removal of the enclosure can be quickly achieved by the use of this type of hinge.

Referring again to FIG. 1, the speakers **82** and **83** are

electrically connected to equipment in the center portion 70 by means of line cord 90. A plug 91 at the end of line cord 90 is received in jack 92 of side vent grill 93. When the enclosure 80 is attached to the center cabinet 70, the excess line cord may be stored in the rear end of enclosure 80. The grill cloth 94 covering the inside surface of the enclosure 80 contains an oversized opening 95 to facilitate storage of line cord 90 in the enclosure. The line cord may be of any desired length, but is normally about 10 feet in length. Thus, as illustrated by the dotted figure of enclosure 81 in FIG. 1, either or both enclosures may be detached from the center portion of the cabinet and placed at any location within a radius determined by the length of their respective line cord connections.

At the front top and front bottom corners of the grill 94 there are provided studs 96 and 97. An eyelet 98 at the bottom front corner of the cabinet 70 is aligned with stud 97. Another eyelet 99 is provided on the upper front corner of lid 76. When the lid 76 is closed this eyelet and stud 96 will also be in alignment. When the enclosure 80 is swung inward against the cabinet 70 and the lid 76 is in its closed position, the studs 96 and 97 will snap into eyelets 99 and 98 respectively, and thus provide a means of securing the lid 76 in its closed position. The right enclosure 81 is similarly provided with studs 101 and 102 which will provide engagement between the enclosure 81 and the center portion 70, and also with the lid 76 when it is closed. Thus the lid 76 will be secured on both sides when the portable phonograph cabinet is completely folded together, as in FIG. 2.

On either side of the front of the center cabinet 70 there are provided cabinet catches 103 and 104. These catches snap over catch lugs 105 and 106 to hold enclosures 80 and 81 respectively against the sides of the center cabinet. A handle 107 is provided on the front of the center portion 70 so that the cabinet may be easily carried when the enclosures and lid are closed. FIG. 2 illustrates the compact integrated contour of the cabinet when it is closed and ready for carrying.

The foregoing cabinet constructed in accordance with the principles of the invention provides a compact unitary housing construction for stereophonic equipment which permits individual arrangement of the speaker systems for each channel. Stereophonic equipment housed in the cabinet is therefore adaptable to meet the acoustical problems presented by common variations in room layout and furnishings. The cabinet is thus well adapted to mass production for the consumer market.

The stereo effect is highly dependent on listening position, and in the cabinet illustrated it is possible to swivel the enclosures to the desired angles without removing the enclosures. Of course, the enclosures may also be angled as desired when they are detached. This flexibility is achived without sacrificing the compactness and beauty of the cabinet. The speakers may be spaced and angled as desired without upsetting the straight-forward look of the unitary cabinet, and the enclosures also serve as

double-sided doors to enclose the cabinet and present a harmonious finished appearance therewith. A cabinet is thus provided to house all equipment needed for reproduction of stereophonic sound and which may be styled as a compact portable unit having a functional construction ideally suited to solve the problems of presenting stereophonic sound.

We claim:

Portable record playing equipment for reproducing stereophonic sound, including in combination,

a main housing having a carrying handle thereon,

electrical components including a turntable and a tone arm within said main housing,

said main housing having a cover pivotally mounted thereto and movable with respect to the front of said main housing for access to said turntable,

left and right speaker enclosures and respective speakers therein for reproducing stereophonic signals,

break-apart hinges supporting each of said speaker enclosures at an edge of the wall of said main housing to which said cover is pivotally mounted,

said speaker enclosures being foldable against said main housing, and said cover being pivotal to closed position on said main housing and between said speaker enclosures, to form a closed compact assembly with a uniform exterior contour,

locking means on said speaker enclosures, said main housing and said cover cooperating to secure said enclosures, said cover, and said main housing in closed condition for carrying purposes,

electric cords connecting said electrical components to said speakers,

said main housing and said speaker enclosures having respective openings to receive said cords for signal coupling therebetween,

said speaker enclosures being pivotal away from said main housing on said hinges and said speaker enclosures being detachable from said main housing to be spaced therefrom with said cords extended for stereophonic sound reproduction with selected spacings of said speakers, said openings to receive said cords providing storage access for said cords with said equipment in closed condition.

References Cited by the Examiner

UNITED STATES PATENTS

2,036,832	4/36	Scheldorf	181—31.1
2,115,773	5/38	Hill	181—31.1
2,547,447	4/51	De Boer	181—31.1
2,878,375	3/59	Schachtel	181—31.1
2,923,370	2/60	De Capite	181—31.1

FOREIGN PATENTS

781,637	4/57	Great Britain.
909,299	12/45	France.

LEO SMILOW, *Primary Examiner.*