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Suzuki

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[54] **CENTRALIZED ELECTRICAL ARRANGEMENT FOR MUSICAL PERFORMANCE BY GROUPS**

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[51] **Int. Cl.** **G10h 1/00**
[58] **Field of Search** ..... 84/1.01–1.04, 84/1.17, 1.24, 1.28, DIG. 17, DIG. 26, DIG. 29, DIG. 25

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[57] **ABSTRACT**

Means for controlling the tones and the volumes of the sounds to be reproduced from electrical signals deliverd by various electronic and/or electrical musical instruments as well as microphones are arranged centrally within a single housing such as a cabinet. The output signals from the aforesaid means are commonly amplified by an amplifier circuit also provided within the housing and are then translated into audible sounds by a loudspeaker positioned outside of the housing. In another embodiment of the invention the housing is served by the console of an electronic organ, in which case the amplifier circuit of the electronic organ itself is utilized for amplification of the signals from the other instruments in use.

2 Claims, 2 Drawing Figures

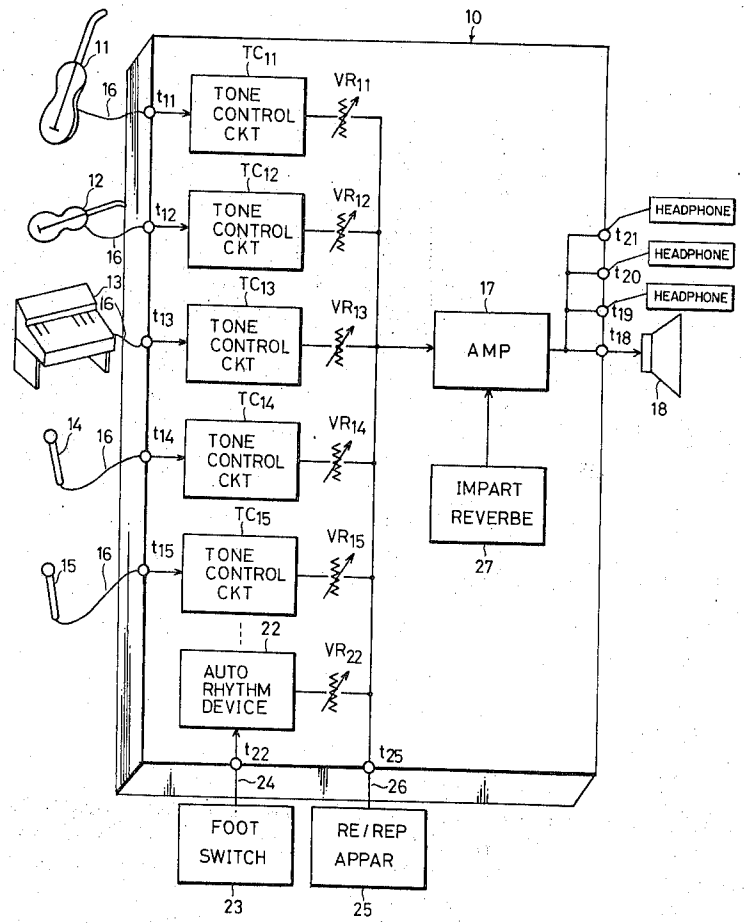


FIG.1

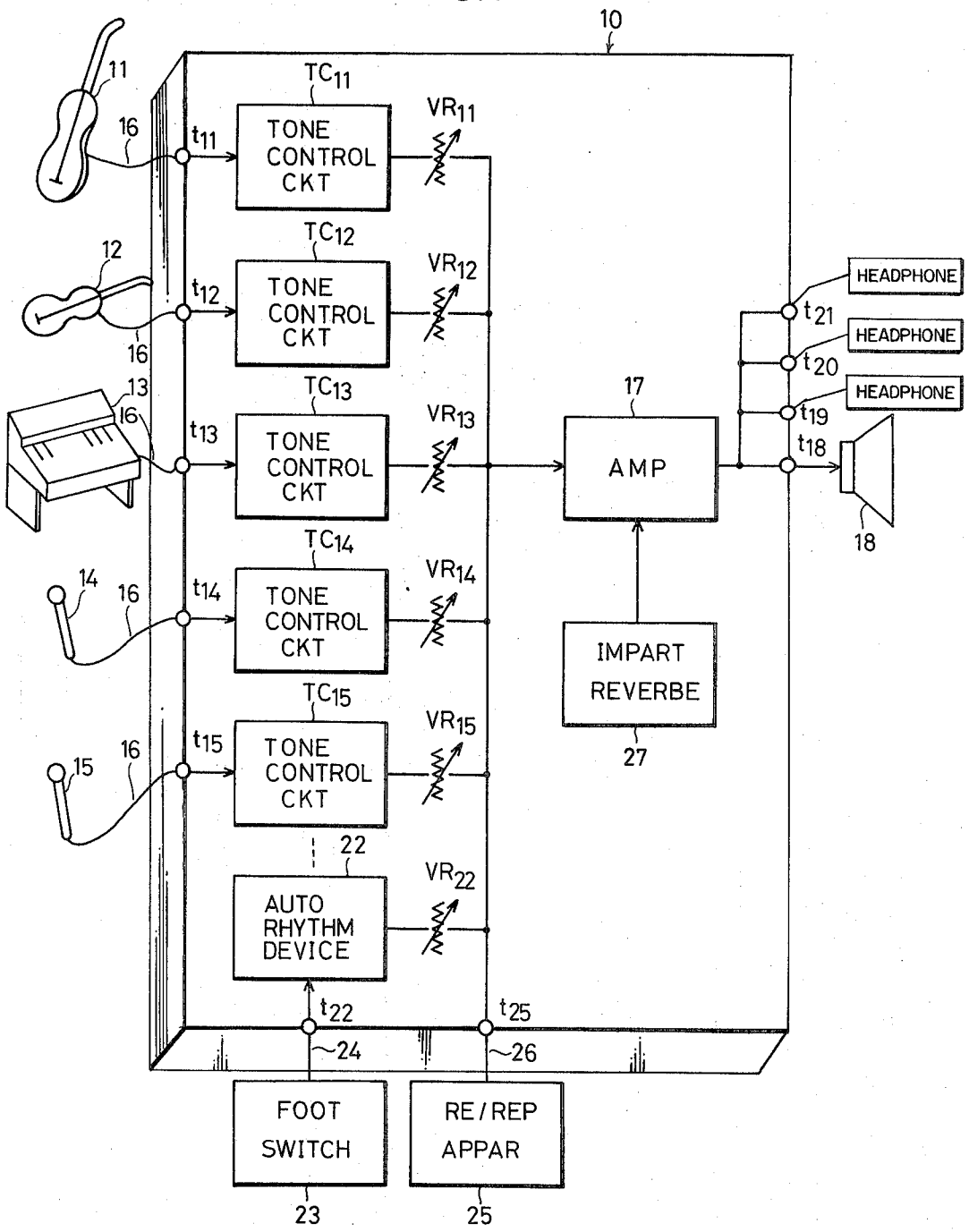
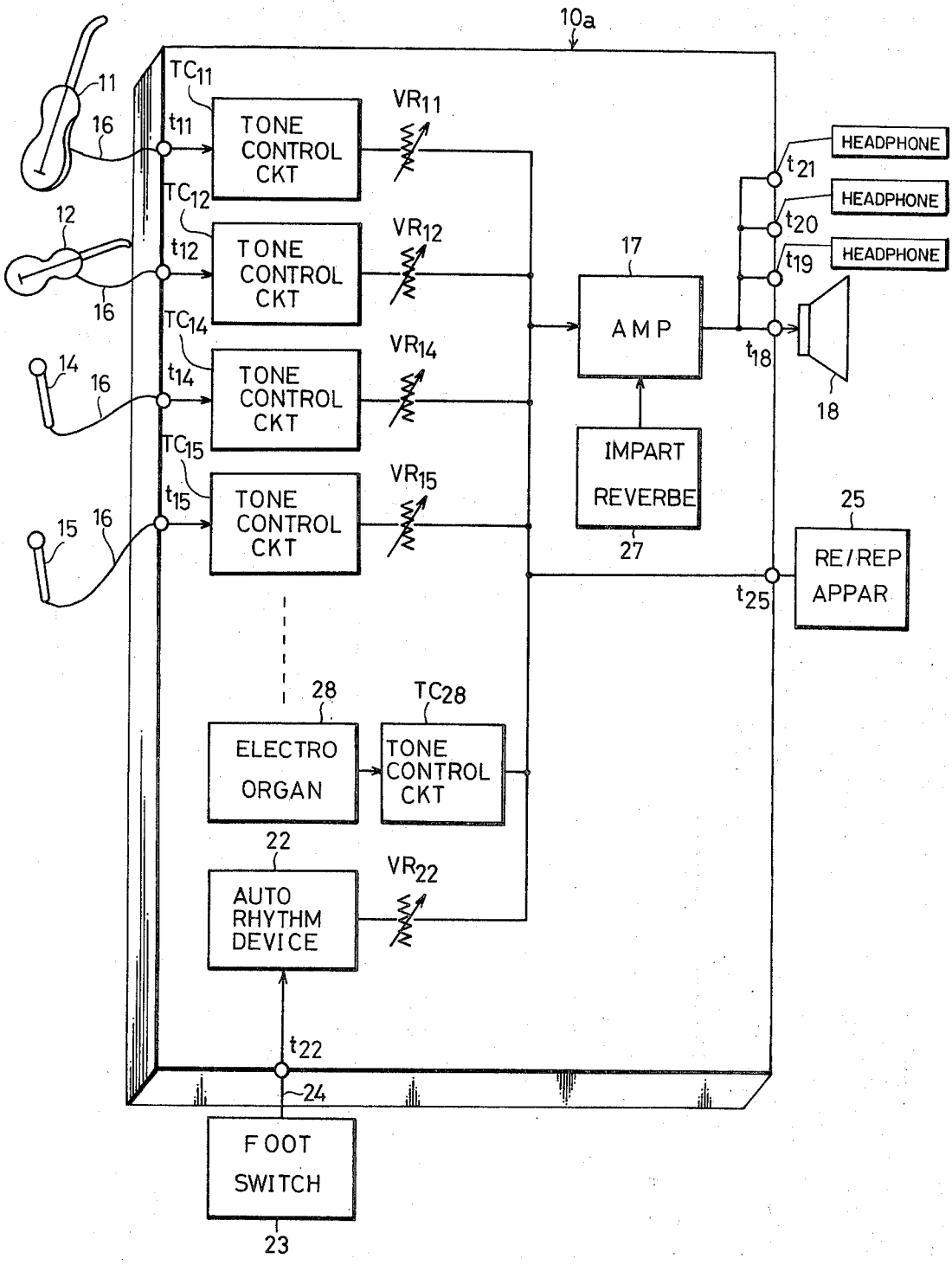

10
11
16
t_{11}
TC_{11}
TONE CONTROL CKT
VR_{11}
12
t_{12}
TC_{12}
TONE CONTROL CKT
VR_{12}
13
t_{13}
TC_{13}
TONE CONTROL CKT
VR_{13}
14
t_{14}
TC_{14}
TONE CONTROL CKT
VR_{14}
15
t_{15}
TC_{15}
TONE CONTROL CKT
VR_{15}
22
AUTO RHYTHM DEVICE
VR_{22}
17
AMP
IMPART REVERBE
27
HEADPHONE
HEADPHONE
HEADPHONE
t_{21}
t_{20}
t_{19}
t_{18}
18
t_{22}
t_{25}
24
26
FOOT SWITCH
RE/REP APPAR
23
25

FIG. 2


10a
11
16
12
16
14
16
15
16
TC11
t11
TONE CONTROL CKT
VR11
TC12
t12
TONE CONTROL CKT
VR12
TC14
t14
TONE CONTROL CKT
VR14
TC15
t15
TONE CONTROL CKT
VR15
17
AMP
IMPART REVERBE
27
HEADPHONE
HEADPHONE
HEADPHONE
t21
t20
t19
t18
18
25
RE/REP APPAR
t25
28
TC28
ELECTRO ORGAN
TONE CONTROL CKT
22
AUTO RHYTHM DEVICE
VR22
t22
24
FOOT SWITCH
23

CENTRALIZED ELECTRICAL ARRANGEMENT FOR MUSICAL PERFORMANCE BY GROUPS

BACKGROUND OF THE INVENTION

This invention relates to a novel system for musical performance by use of a plurality of electronic and/or electrical musical instruments (hereinafter referred to as "electrophonic musical instruments" to mean both types of instruments) together with or without microphones.

Heretofore, for electrophonic musical performance in auditoriums or in similarly large spaces, tone control and volume control means of known constructions have been provided separately for various instruments in use such for example as an electric bass, an electric guitar, an electronic organ, an automatic rhythm accompaniment device, and one or more microphones for picking up the sounds of a vocalist, a trumpet, a flute and so forth. The output signals from such means have then been amplified by their respective amplifiers and further reproduced through separate loudspeakers.

However, for performance in less commodious locations or during preleminary exercises, such bulky equipment is unnecessary or indeed undesirable, and relatively small output power is usually required for these purposes. The separate arrangement of the tone control and volume control means and so forth also makes difficult the adjustment of the relative tones and volumes of the sounds to be produced by various instruments.

A further disadvantage of the prior art arrangement makes its appearance in connection with the use of a recording/reproducing apparatus. Conventionally, for recording of a musical performance in accordance with the prior art, the loudspeakers connected to the various electrophonic instruments and microphones have been arranged suitably close to a single microphone connected to the recording/reproducing apparatus. The reproduction of the thus-recorded sounds has also required an amplifier and a loudspeaker provided exclusively for this purpose.

SUMMARY OF THE INVENTION

In view of the listed disadvantages of the prior art it is an object of the present invention to provide a novel system for electrophonic musical performance particularly suitable for employment in narrowly confined spaces.

Another object of the invention is to provide a system for electrophonic musical performance whereby the relative tones and volumes of the sounds to be reproduced from signals supplied by various electrophonic musical instruments and/or microphones are easily adjustable.

A further object of the invention is to provide a system for electrophonic musical performance such that a recording/reproducing apparatus can be used for direct recording of the signals as they are fed into a common amplifier circuit, the recorded signals being reproduced through the amplifier circuit and a loudspeaker which are provided for sound reproduction from the signals supplied by the electrophonic musical instruments and/or microphones.

A still further object of the invention is to provide a system for electrophonic musical performance such

that any desired number of headphones can be used to permit the performers to privately listen to their own combined sounds while making exercises.

With these objects in view and the other objects hereinafter set forth, the present invention provides, in its broader aspects, a system for electrophonic musical performance comprising a housing, and a plurality of input terminals provided to the housing for connection of electrophonic musical instruments or other sources of electrical signals to be reproduced as musical sounds. The housing contains tone control means for controlling the tones of the sounds to be reproduced from the respective electrical signals supplied thereto from the input terminals, and volume control means for controlling the volumes of the sounds. An amplifier circuit is also provided within the housing for commonly amplifying the electrical signals which have passed through the tone control means and the volume control means, and the amplified electrical signals are translated into audible sounds through a loudspeaker positioned outside of the housing and connected to its output terminal. The housing may be in the form of a cabinet of any desired shape or may be served by the console of an electronic organ which also takes part in the musical performance.

The features which are believed to be novel and characteristic of this invention are set forth with particularity in the appended claims. The invention itself, however, together with the further objects and advantages thereof, will be best understood from the following description taken in conjunction with the accompanying drawings which illustrate, by way of example only, some preferred embodiments of the invention and throughout which like reference characters designate like parts.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. 1 is a schematic block diagram showing a system for electrophonic musical performance by way of a first preferred embodiment of the present invention; and

FIG. 2 is also a schematic block diagram showing another preferred embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, and first of all to FIG. 1 thereof which illustrates a first preferred embodiment of the invention adapted for use in narrowly confined spaces by a relatively small group of performers, the reference numeral **10** designates a housing such for example as a cabinet or console of any desired shape for accommodating various means hereinafter set forth. The cabinet **10** is furnished with a plurality of, five in this embodiment, input terminals t_{11} to t_{15} for connection of any desired electrophonic musical instruments and/or microphones through cords **16**. In the illustrated embodiment of the invention the input terminals are connected, purely by way of example, with an electric bass **11**, an electric guitar **12**, an electronic organ **13**, a microphone **14** for picking up the sound of a vocalist, and another microphone **15** for picking up the sound of a trumpet. The constructions of all these instruments are well known to those in the art and by themselves do not constitute a part of this invention.

The input terminals t_{11} to t_{15} are connected to the inputs of tone control circuits TC_{11} to TC_{15}, respectively,

which are housed within the cabinet **10**. These tone control circuits determine in a known manner the qualities or tones, or "timbres," of the sounds to be reproduced from the electrical signals delivered thereto from the electric bass **11**, the electric guitar **12**, the electronic organ **13** and the microphones **14** and **15**.

The outputs of the tone control circuits TC_{11} to TC_{15} are connected to volume controls VR_{11} to VR_{15}, respectively, and thence commonly to the input of an amplifier circuit **17**. Both the volume controls and the amplifier circuit are housed within the cabinet **10**. The output of the amplifier circuit is connected to an output terminal t_{18}, to which is connected a loudspeaker **18**, and further to one or more, three in this embodiment, additional output terminals t_{19} to t_{21}. These additional output terminals are to be connected to headphones, **40**, which are to be worn by the performers themselves so that they can listen to their own music during exercises without disturbing the neighbors.

An automatic rhythm accompaniment device of well known construction is installed at **22** within the cabinet **10** to produce rhythmic sounds. The output of this automatic rhythm accompaniment device is connected to the input of the aforesaid amplifier circuit **17** via a volume control VR_{22}, whereas its input is connected to a terminal t_{22} for connection of a foot switch **23** through a cord **24**.

A further terminal t_{25} is connected between the volume controls VR_{11} to VR_{15} and VR_{22} and the input of the amplifier circuit **17**, and a recording/reproducing apparatus of any suitable construction is provided at **25** outside of the cabinet **10** for connection to the terminal t_{25} through a cord **26**. Provided at **27** within the cabinet **10** and connected to the amplifier circuit **17** is the known means for imparting reverberations to the sounds reproduced from the loudspeaker **18**.

The first preferred embodiment of this invention being constructed as hereinbefore described, the electrical signals supplied through the input terminals t_{11} to t_{15} from the electric bass **11**, the electric guitar **12**, the electronic organ **13** and the microphones **14** and **15** are first delivered to their respective tone control circuits TC_{11} to TC_{15}, where the tones of the sounds to be reproduced from the respective electrical signals are determined as aforesaid in accordance with the prior art. The volumes of the sounds to be reproduced from these signals are suitably regulated by the succeedingly provided volume controls VR_{11} to VR_{15}. The signals are further transmitted through the amplifier circuit **17**, where they are altogether amplified to a desired extent, and are reproduced as integrally combined audible sound by the loudspeaker **18** connected to the output terminal t_{18}.

If now the foot switch **23** connected to the input terminal t_{22} is operated by the foot, the automatic rhythm accompaniment device **22** functions in accordance with the prior art to produce rhythmic sound from the loudspeaker **18** via the volume control VR_{22} and the amplifier circuit **17**. By connecting the recording/reproducing apparatus **25** to the terminal t_{25}, the output signals from the tone control circuit TC_{11} to TC_{15} and the automatic rhythm accompaniment device **22** can be recorded via the volume controls VR_{11} to VR_{15} and VR_{22}. For reproduction, the recorded signals from the output of the recording/reproducing apparatus are first amplified by the amplifier circuit **17** and are then reproduced by the loudspeaker **18** as audible sound.

Further by connecting the headphones to the output terminals t_{19} to t_{21}, the performers can make exercises while privately listening to their own combined sounds. Furthermore, since no externally audible sound is produced during use of a headphone or headphones, this system of musical performance can be employed favorably for exercises at nighttime or in locations where the production of any loud sound is undesirable.

Illustrated in FIG. **2** is another preferred embodiment of the invention, in which the cabinet **10** of the FIG. **1** embodiment is replaced by the console **10***a* of an electronic organ itself. The console **10***a* is equipped with the input terminals t_{11} to t_{14} for connection of, also purely by way of example, the electric bass **11**, the electric guitar **12** and the microphones **14** and **15** through the cords **16**. As in the preceding embodiment the input terminals are connected to the inputs of the tone control circuits TC_{11}, TC_{12}, TC_{14} and TC_{15}, respectively, which are housed within the electronic organ console **10***a*. The outputs of these tone control circuits are connected to the respective volume controls VR_{11}, VR_{12}, VR_{14} and VR_{15} and thence commonly to the input of the amplifier circuit **17**. Although the amplifier circuit **17** is provided intrinsically for the amplification of the signals of the electronic organ, it is here adapted for amplification of all the other signals supplied through the input terminals t_{11} to t_{14} as well.

As discussed previously in connection with the FIG. **1** embodiment, the tone control circuits TC_{11}, TC_{12}, TC_{14} and TC_{15} determine in accordance with the prior art the qualities or tones of the sounds to be reproduced from the electrical signals delivered thereto from the electric bass **11**, the electric guitar **12** and the microphones **14** and **15**, respectively. Moreover, by adjustment of the volume controls VR_{11}, VR_{12}, VR_{14} and VR_{15}, the volumes of the sounds to be reproduced can be suitably regulated. The electrical signals which have passed through the tone control circuits and the volume controls are then commonly amplified by the amplifier circuit **17** and are reproduced by the loudspeaker **18** as integrally combined audible sound.

The console **10***a*, of course, is equipped at **28** with the usual keyboards and pedal board of the electronic organ together with the circuitry necessary for the production of the desired electrical signals. This circuitry is connected to a tone control circuit TC_{28} and thence to the input of the amplifier circuit **17**. Thus, by playing on these keyboards and pedal board in the usual manner, the corresponding signals from the electronic organ circuitry are transmitted through the tone control circuit TC_{28} and the amplifier circuit **17** and are reproduced by the loudspeaker **18**.

The automatic rhythm accompaniment device **22** also provided within the console **10***a* is connected, on the one hand, to the terminal t_{22} and, on the other hand, to the input of the amplifier circuit **17** via the volume control VR_{22}. The terminal t_{22} may be connected to the foot switch **23** through the cord **24**. By operating this switch **23** by the foot the rhythmic sound can be produced as previously mentioned from the loudspeaker **18** via the automatic rhythm accompaniment device **22**, the volume control VR_{22} and the amplifier circuit **17**.

Also as in the FIG. **1** embodiment, the recording/reproducing apparatus **25** is provided outside of the console **10***a* for connection to the terminal t_{25}, and the means **27** for imparting reverberations to the sound re-

produced from the loudspeaker 18 is connected directly to the amplifier circuit 17 within the console 10*a*. The output terminals t_{19} to t_{21} are likewise provided in addition to the output terminal t_{18} for connection of the headphones 40 which most suitably may be worn by the performers themselves during exercises.

As may now be apparent, this second preferred embodiment of the invention is still more space-saving than the first described embodiment because it requires no other housing than the console of the electronic organ which also takes part in the musical performance. Hence, this latter embodiment is particularly well suited for employment in narrowly confined spaces by a small group of performers.

While it is believed that the various explicitly stated and implicitly suggested objects of this invention are fully accomplished by the preferred embodiments herein disclosed, it will be easy for those skilled in the art to devise many modifications, substitutions and changes of the embodiments, while still remaining within the spirit and scope of the invention, without prejudicing the novelty thereof.

I claim:

1. A system for electrophonic musical performance comprising:

a housing;

a plurality of input terminals provided to said housing for connection of sources of electrical signals to be reproduced as musical sounds;

tone control means operatively electrically connected to said input terminals and within said housing for controlling the tones of the sounds to be reproduced from the respective electrical signals supplied thereto from said input terminals;

volume control means operatively electrically connected to said tone control means and within said housing for controlling the volumes of the sounds to be reproduced from the respective electrical signals;

an amplifier circuit operatively connected to said volume control means and within said housing for amplifying the electrical signals which have passed through said tone control means and said volume control means;

said amplifier circuit having an output provided to said housing and connected to the output of said amplifier circuit, said output terminal being adapted for connection of means for translating the amplified electrical signals into audible sounds;

a recording/reproducing apparatus provided outside of said housing and electrically operatively connected to said amplifier circuit;

means within said housing connected to said amplifier circuit for imparting reverberations to the sounds reproduced from the electrical signals, and

an automatic rhythm accompaniment device within said housing connected to said amplifier circuit via said volume controls means for producing a rhythmic sound from said means connected to said output terminal of said housing, said automatic rhythm accompaniment device being operated by means of a foot switch provided outside of said housing.

2. The system as set forth in claim 1, further including at least one additional output terminal provided to said housing and connected to the output of said amplifier circuit, said additional output terminal being adapted for connection of a headphone, and a headphone connected to said additional output terminal.

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