

United States Patent

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[33] Japan
[31] 42/42190 and 42/44925

[56]

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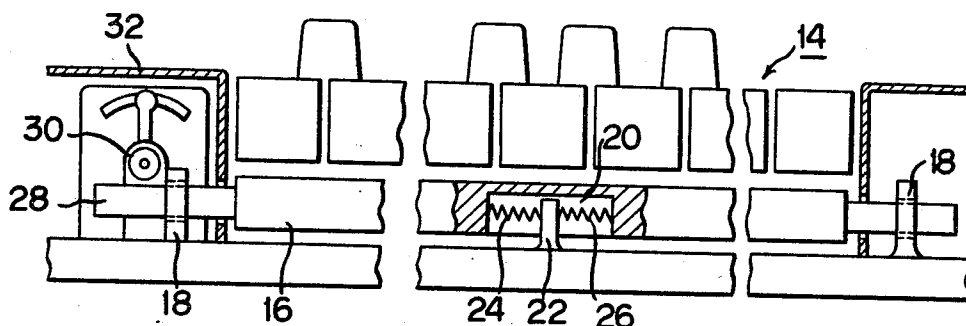
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[54] **ELECTRONIC MUSICAL INSTRUMENT WITH
MANUAL ROD CONTROLLED SPECIAL EFFECTS
AS VIBRATO AND THE LIKE**
6 Claims, 7 Drawing Figs.

[52] U.S. Cl. 84/1.25,
84/1.17, 84/1.18
[51] Int. Cl. G10h 1/02
[50] Field of Search 84/1.18,
1.24, 1.25, 1.01, 1.13, 1.14, 1.17, 1.26, 1.27,
(D,E)

ABSTRACT: An electronic musical instrument comprising a manual keyboard for selectively switching the tones, a manually operable rod movably mounted in front of said manual keyboard and extending throughout substantially the full width thereof, and an electric transducer actuated by the movement of said manually operable rod to produce certain musical effect such as vibrato, tremolo or the like. The transducer may be a variable impedance or transformer, a light-shutter-photocell arrangement, or a switch adapted to influence the tone generators.



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SHEET 1 OF 3

FIG. 1

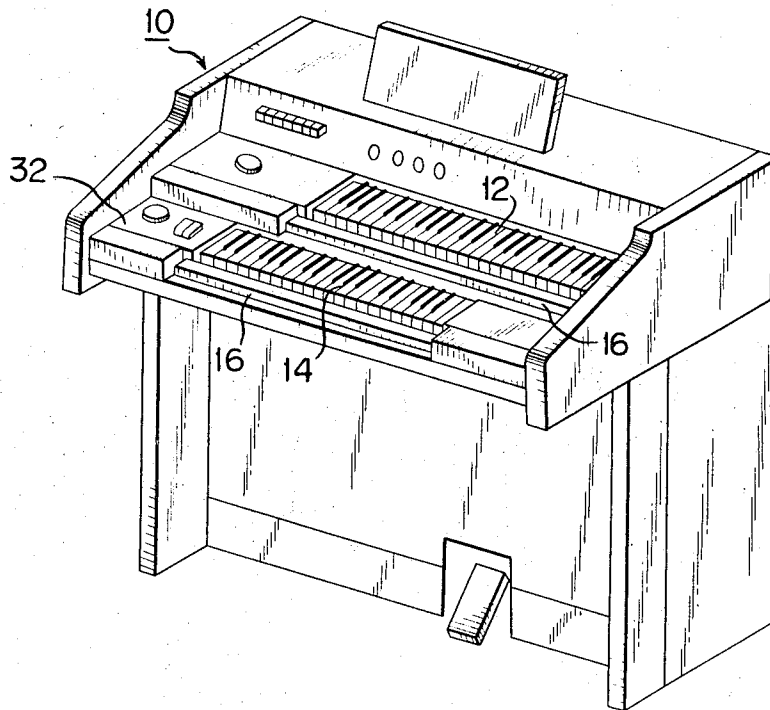
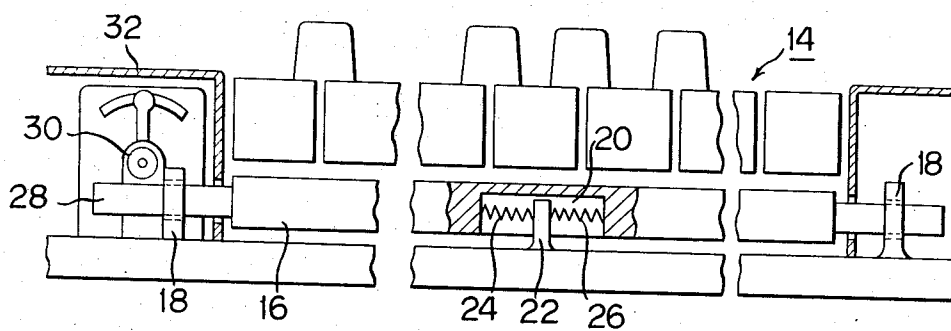


FIG. 2



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FIG. 3

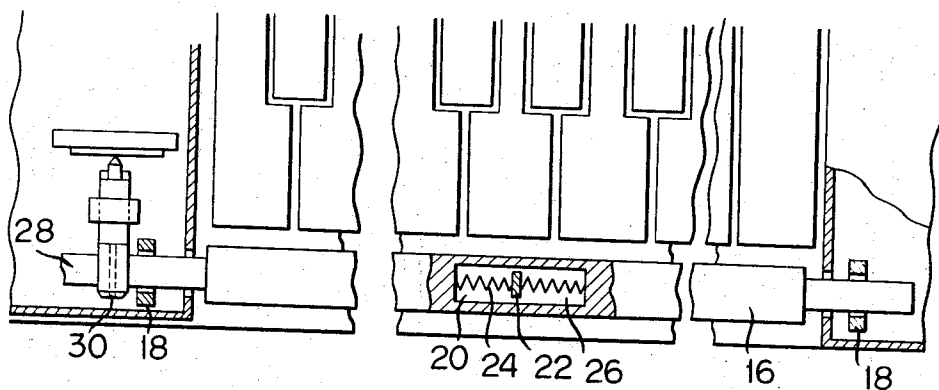
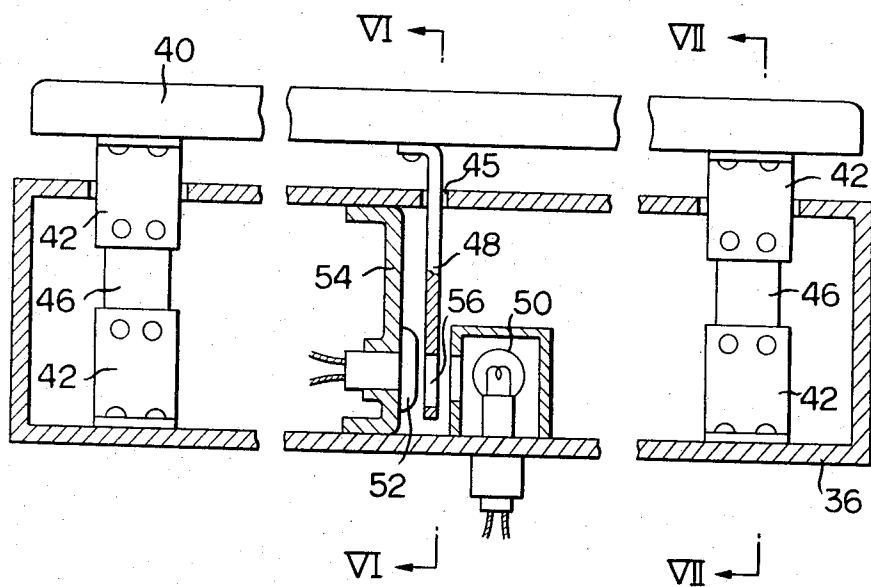


FIG. 4



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FIG. 5

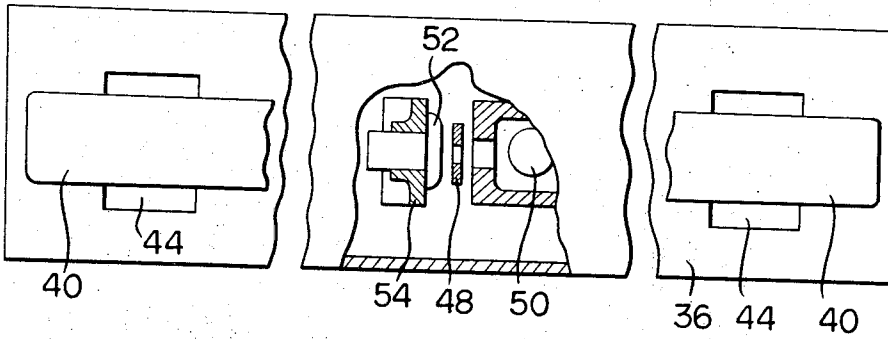


FIG. 6

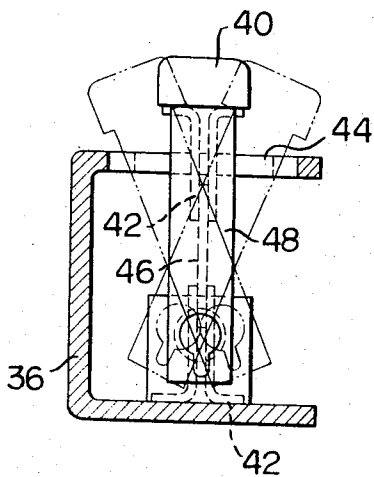
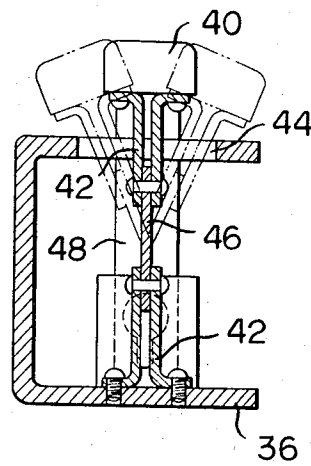


FIG. 7



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ELECTRONIC MUSICAL INSTRUMENT WITH MANUAL ROD CONTROLLED SPECIAL EFFECTS AS VIBRATO AND THE LIKE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an electronic musical instrument, and, more particularly, it relates to an electronic musical instrument which comprises a manual keyboard or keyboards for selectively switching the tones and means for producing certain special musical effect such as vibrato, tremolo or the like.

2. Description of the Prior Art

An electronic musical instrument including means for producing the special musical effect such as vibrato, tremolo or the like, which has been known in the art, uses a manually operable lever or levers mounted on a control panel of the musical instrument in order to control the means for producing the special effect. However, such lever or levers are hardly operable when a player is playing on the keyboard with his both hands. Therefore, it is hard to freely vary the speed and/or depth of the effect as desired while he is playing the musical instrument.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an electronic musical instrument in which a special musical effect can be easily controlled even when a player is playing the musical instrument with his both hands.

It is another object of the present invention to provide an electronic musical instrument in which the special effect can be freely varied in speed or depth as desired.

In accordance with the present invention, there is provided an electronic musical instrument comprising a manual keyboard for selectively switching the tones, a manually operable rod movably mounted in front of said manual keyboard and extending throughout substantially the full width thereof, and an electric transducer adapted to be actuated by the movement of said manually operable rod to produce certain musical effects such as vibrato, tremolo or the like.

In one form the manually operable rod is formed as a slidable rod which is slidable to the right and the left in front of the manual keyboard and is associated at its one end with the electric transducer.

In another form, the manually operable rod is formed as a swingable rod which is swingably mounted on a frame positioned in front of the keyboard and has an actuator thereon for actuating the electric transducer.

In operation, the player can move the manually operable rod, rightward and leftward or forward and backward, while playing the keyboard, thereby actuating the electric transducer to produce a glide effect by shifting the tone generator frequencies within a predetermined range, or change the speed or depth of the vibrato effect generated by the vibrato circuit or the depth of the mandolin effect generated by the mandolin circuit. The manually operable rod is positioned in front of the keyboard, so that the player can easily operate the rod with his palm while playing the keyboard with his fingers, and he can freely vary the depth or speed of the effect as desired from time to time.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings illustrate embodiments of the present invention, in which:

FIG. 1 is a perspective view of the electronic musical instrument according to the present invention;

FIG. 2 is a front view, partly broken, of the main part of FIG. 1;

FIG. 3 is a plan view, partly broken, of FIG. 2;

FIG. 4 is a sectional front view showing the main part of another embodiment of the present invention;

FIG. 5 is a plan view of FIG. 4; and

FIGS. 6 and 7 are sectional views, taken along lines VI-VI and VII-VII of FIG. 4, respectively.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1-3 illustrate an embodiment of the present invention. An electronic musical instrument generally designated by numeral 10 comprises manual keyboards, an upper keyboard 12 and a lower keyboard 14. A manually operable rod 16 is disposed in front of the lower keyboard and extends throughout the full width of the keyboard. As clearly shown in FIGS. 2 and 3, the manually operable rod 16 is movably mounted for right and left movements along guides 18 fixed in front of the keyboard 14 at the opposite sides thereof. The manually operable rod 16 is roughened at its upper surface or provided with rubber or leather sheet adhered thereon, in order to prevent the palm of a player from slipping on the surface. The rod 16 is formed with a hollow chamber 20 at its central portion and a fixed plate 22 is received therein. A pair of helical compression springs 24 and 26 are disposed between the opposite sides of said fixed plate 22 and the end surfaces of said hollow chamber, respectively. One end of said manually operable rod 16 extends into a keyboard side panel 32 to form an actuator 26, which engages with a driven wheel 30, such as a rubber wheel or a pinion. The driven wheel 30 is associated with an electric transducer, which is actuated by the wheel 30 to produce certain musical effect such as vibrato, tremolo etc. The fixed plate 22 may either be fixed on a key bed or formed as an integral part projecting therefrom so that it may not be moved when the manually operable rod 16 is manually operated to the right and the left.

The helical compression springs 24 and 26 are disposed in the hollow chamber 20 at the opposite sides of the fixed plate 22, and when the rod is manually operated, one of said springs is more compressed between the one end surface of the chamber and the fixed plate while the other spring is less compressed, which tends to return the rod to the original position when the rod is released.

The electric transducer, which may be made a variable resistor, variable inductor, variable capacitor, variable transformer, photoelectric element, switch, or the like is disposed in the keyboard side panel 32. The electric transducer is actuated through the driven wheel 30 by the manually operable rod 16 to energize a vibrato or other effect circuit.

The actuator 28, which is formed as an extension of the manually operable rod 16, has a rack formed thereon or a rubber plate adhered thereon, in order to rotate, without slippage, the driven wheel 30 associated with the electric transducer.

FIGS. 4-7 illustrate another embodiment of the present invention. In this embodiment, a frame 36 is fixedly mounted in front of a keyboard (not shown) and an electric transducer is housed therein. A manually operable rod 40 is supported by supporting members 42, which extend through apertures 44 formed in the upper wall of said frame and resiliently mounted on the bottom of said frame by leaf springs 46, and thus the manually operable rod 40 is swingable forward and backward over the frame. An actuator 48 for actuating the electric transducer, which is fixed on the underside of said manually operable rod, extends through the aperture 45 into the frame 36, and it is moved forward and backward by the swinging movement of the manually operable rod.

In the form illustrated in FIG. 4, the electric transducer is formed as a photoelectric transducer including a lamp 50 and a photoelectric element 52 supported on a supporting plate 54. The actuator 48 is formed as a shutter plate having an aperture 56 through which a light emitted from the lamp 50 passes to reach photoelectric element 52. By swinging the manually movable rod 40 forward and backward, the photoelectric element 52 receives more or less light flux passing through the aperture 56, thereby producing more or less musical effect, correspondingly.

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In operation, a player can move the manually operable rod rightward and leftward, in FIGS. 1—3, or forward and backward, in FIGS. 4—7, with his palm, while playing the keyboard with his fingers, thereby producing special musical effect as desired.

We claim:

1. An electronic musical instrument comprising a manual keyboard having a plurality of keys operatively connected for selectively switching tones and with their upper surfaces normally kept substantially in the same plane, a manually operable rod movably mounted in front of said manual keyboard, said rod being movable in a plane substantially parallel to the plane of the upper surfaces of said keys, and an electric transducer adapted to be actuated by the movement of said manually operable rod to produce certain musical effects.

2. An electronic musical instrument according to claim 1, in which the manually operable rod is a rod mounted so as to be slidable in its lengthwise direction and is operatively connected at one end with the electric transducer.

3. An electronic musical instrument according to claim 2, 20

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further comprising guide means slidably supporting said rod at both ends, a fixed plate, and spring means disposed between the rod and said fixed plate to oppose movement of said rod.

4. An electronic musical instrument according to claim 3, in which the manually operable rod has a hollow portion formed therein for receiving the fixed plate and having opposite end surface, and the spring means comprising a pair of helical spring means disposed between said end surfaces and the fixed plate.

5. An electronic musical instrument according to claim 1, in which the manually operable rod is a rod mounted to swing in a direction substantially perpendicular to its length, and actuator means mounted on said rod for actuating the electric transducer.

6. An electronic musical instrument according to claim 5, further comprising leaf spring means supporting said rod at its both ends, said rod being swingable against the resistance of said leaf spring means.

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