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2,722,152

MUSICAL INSTRUMENT

Filed May 28, 1951

2 Sheets-Sheet 1

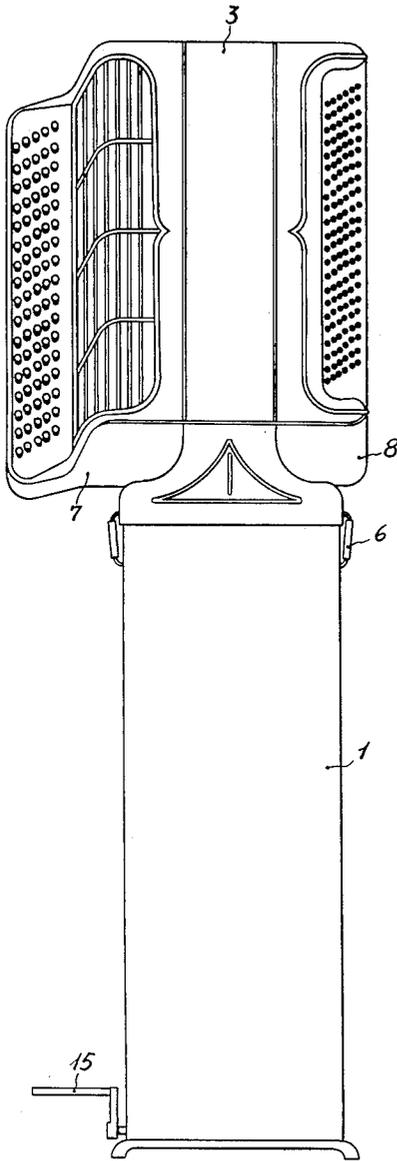


FIG. 1

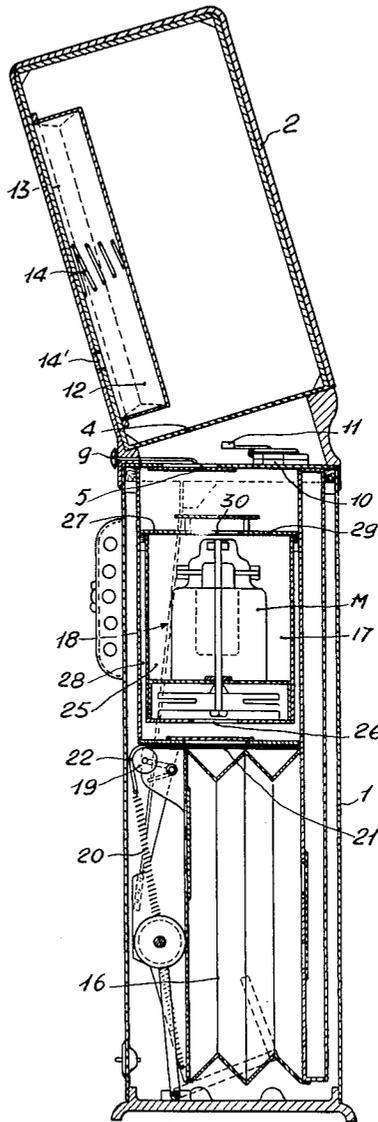


FIG. 2

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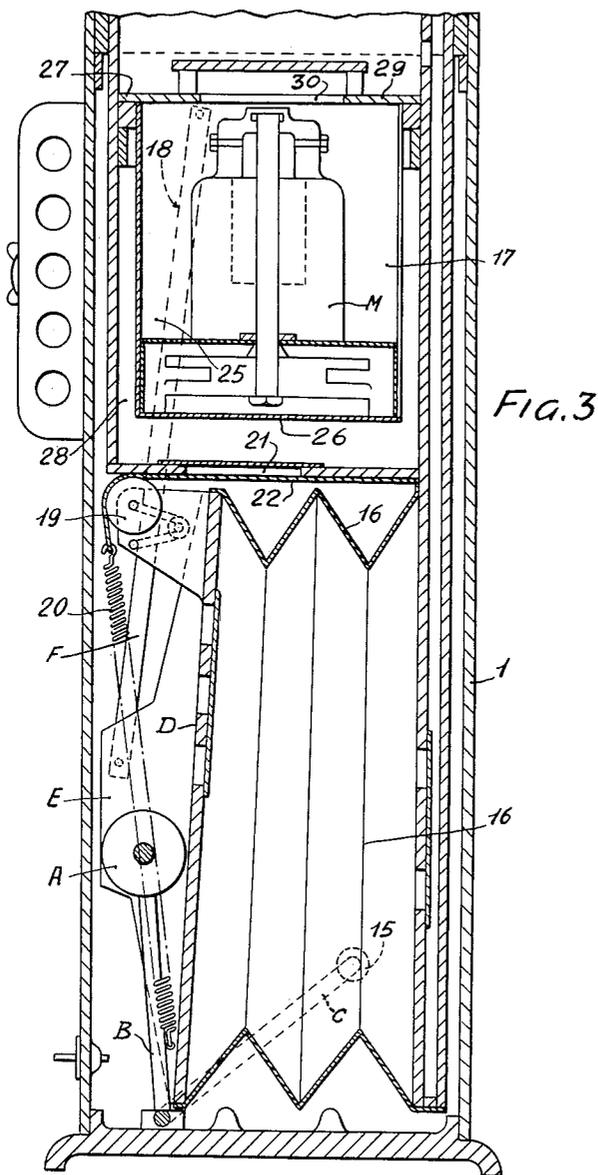
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## MUSICAL INSTRUMENT

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8 Claims. (Cl. 84—355)

This invention relates to a musical instrument showing the combination of an accordion with an electrical system of control for producing compressed air having the pressure required for playing the accordion itself.

More precisely the invention relates to an instrument comprising an accordion fitted to a box, vertically in a manner easily replaceable, the box being fixed on the column containing the electric motor, a fan, and control elements for checking the quantity of air blown by the fan. The box is provided with small bellows kept open by a spring and actuated by the air blown by the fan so as to act as a sound balancing device, whereas in the support column there is furthermore provided a bellows controlled by the pedal which controls also the electric motor so as to regulate the quantity of air entering the chamber of the motor.

The invention will be more fully described with reference to the accompanying drawings which diagrammatically show an embodiment of the invention, and wherein:

Figure 1 is a front elevational view of the instrument.

Figure 2 is a sectional view taken in a vertical plane but perpendicular to the elevational view in Figure 1, and

Fig. 3 is a large scale fragmentary sectional view similar to Fig. 2.

The musical instrument of this invention comprises a stand or column 1 containing in its upper part the motor M, in the lower part the bellows to be described hereinafter. The stand constitutes a support for the accordion 3 which is fitted to a box 2 also supported on and connected to the stand 1. To the box 2, which is rectangular shaped and as wide as the frame of the accordion 3 when this is closed, is attached the accordion 3 in such a manner as to have it easily replaceable, so that the stand may be of service for practically any kind of accordion. The box 2 has its base 4 fixed in a slanting position, so that the accordion besides being at a height easily accessible to the player is also in a proper position of inclination. Said box 2 is secured in closed position by elastic hooks 6. The bottom of the box is provided with a slot 5 for the inlet of the air; at one end there is attached the treble part 7 at the other end there are the bass keys 8. The slot 5 which admits the air is being operated by a valve 9 in turn controlled by a register. Furthermore, a second slot 10 is provided for producing the tremolo sound. More precisely, when the valve 9 is closed the air does not pass through the slot 5 but through the hole 10, a bellows is disposed on the hole 10 which is closed by a valve actuated by a small weight 11 urged elastically, said valve letting in a steady but puffy flow of air to the space 12, thus giving rise to a tremolo sound for the treble notes as well as for the bass notes. The chamber 12 in which the air is admitted also contains a small bellows 13 which is kept open by a spring 14, said chamber 12 having also an orifice 14' as air outlet. In this manner an alternate passing in and out of the air through said hole is allowed according to the wind blown from the fan, the

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bellows thus acting as a balancing device preventing the accordion from generating any asthmatic sound.

The motor M is controlled by the pedal 15 which also controls the bellows 16, this latter having intake and check valves in the air pipes for the air to be blown to the chamber 17 of the motor. The bellows 16 is guided by two metal strips 18 fixed on top of the chamber 17 and connected to the bellows, thus allowing the bellows to be kept open when the pedal is not depressed, and insuring the return of the bellows to the open position. The bellows has a roller 19 which carries a flexible band or ribbon or strip 22 of leather or similar material, one end of which is disposed above the bellows and passes over a window 21, through which the air is being drawn in, whereas the other end of the band 22 is attached to a spring 20 and the spring 20 is connected to the bellows 16. In this manner when the pedal 15 is depressed the ribbon 22 opens more or less the window 21, and therefore allows the suction of the air for the motor. The window 21 forms with the flexible strip 22 a valve to control the passage of air from the bellows chamber to the intake side of the fan. The flexible strip 22 has a length equal to the width of the bellows chamber, and the roller A (Fig. 3) applies at a point below the midway of the height of the bellows chamber against the wall D of the bellows 16, when urged into engagement with the wall D by the pedal 15. The roller A is connected to the pedal 15 by means of a rod B that is interconnected to a rod C. The bar F is used as a guide for the bellows 16 and is pivoted at its lower end to a flange E of the bellows 16, and at its upper end to the upper housing enclosing the motor M. On releasing the treadle 15 said strip 22 closes anew the window 21, and thus the bellows besides controlling the air to the motor independently of the quantity of the air, gives rise to snapped and undulated sounds, the so-called "chiaro scuro" such as may be achieved by means of the conventional bellows of the hand operated accordion.

The motor M is suspended separately, thus allowing to have it silent in that its acoustical parts are not in contact with the remaining parts, furthermore it does not cause the apparatus to vibrate. Said motor is contained in a bag 25 of leather or other similar material, having the same diameter as that of the motor, the bag being provided with a hole 26 through which the motor draws in the air. Said bag bears on the bottom through a sound deadening gasket. Above the bag there is a ring 27 which holds the bag and its sides with the intermediary of a tightly closing and elastic gasket bears on a soundproof chamber 28, which besides acting as a sound reducer does not allow any return of excessive air to the suction part. The chamber 28 in the inside is cloth lined, so that besides quenching the noise said chamber protects the motor, which is only borne suspended, from impact during the transport of the stand 1. On the top wall of the bag 25 there is attached a cover 29 having a hole 30 for the exit of the air; the hole has a diameter smaller than that of the motor, thus preventing the motor to fall out of the bag when upsetting the stand. Inasmuch as the motor is only fixed by means of screws it can be easily removed upon taking away the cover 29. The instrument is further equipped with a rheostat which is adjustable by means of a knob, the regulation of which changes the motor speed to enable the wind pressure to have the value needed for the desired sound.

As already explained the starting of the motor is achieved by the treadle 15, but this latter allows also for control of the dynamics of the sound. When the foot bears gently on said pedal the motor is being started before the suction of the air is sufficient for the accordion to give a sound. Depressing the pedal a little more causes the hole 21 to be gradually opened, thus giving

rise to a very low sound, whereas a full or sudden depression of the pedal brings about the sudden increase of the air volume, the performance so achieved being similar to that of a conventional accordion. Removing the foot from the pedal will stop the motor automatically. I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

What I claim is:

1. In a musical instrument, the combination with an accordion, of a support for said accordion maintaining the same upright in playing position, and a mechanism connected to said support and being operable to supply to said accordion compressed air, said mechanism comprising a fan, a motor for said fan, said motor and fan being suspended floatingly and being insulated to be substantially soundproofed, conduits positioned for delivering compressed air from said fan to said accordion, a regulator for said motor movable for varying the speed of said fan, a pedal operable for actuating said regulator, a bellows operable to deliver air to the intake side of said fan and normally expanded and collapsible in response to the movement of said pedal for increased fan speed to enlarge the volume of air delivered to said accordion for increasing the sound volume emanating therefrom, and a valve between said bellows and the intake side of the fan operable from said pedal to be opened proportionately to the extent of pedal and bellows movement.

2. In a musical instrument, as claimed in claim 1, together with, resilient means connected to said bellows and being biased for urging said bellows to be normally expanded.

3. In a musical instrument, as claimed in claim 1, said valve comprising an opening formed between said bellows and said fan, a flexible belt mounted adjacent said opening and normally disposed across said opening for covering the same and respectively being movable for uncovering said opening and connected to said regulator, and a tension roller in rolling contact with said belt and being movable perpendicularly of its axis in opposite directions whereby said opening will be covered and respectively uncovered to an extent proportional to the pedal and bellows movement.

4. In a musical instrument, as claimed in claim 1, together with, said support including a box adjacent an upright side of said accordion and operable to receive compressed air from said fan for supply therefrom to

said accordion, said box including a series of bellows biased towards open position and operated by the compressed air delivered into said box, said bellows being operable to dampen and equalize the air pressure rendering the air substantially free from pressure variations for balancing the sound.

5. In a musical instrument, as claimed in claim 4, two slots formed in said box, a valve operable for opening and closing one of said slots, a tremulant mechanism adjacent the other slot comprising a bellows and a weight and actuatable by the passage of air when the said one slot is closed by said valve.

6. In a musical instrument, as claimed in claim 1, a bag suspended in said support and spaced from the walls of said support and made of material substantially impermeable to the passage of audio-frequency waves for soundproofing the bag interior, said motor and fan being supported internally of said bag for substantially soundproof suspension in said support.

7. In a mechanism, as claimed in claim 1, in combination with, cushioning means disposed in the space between said bag and the walls of said chamber and being operable for dissipating any shock delivered to said fan upon impact between said bag and said wall, during transport.

8. In a mechanism, as claimed in claim 1, said bag having an open top larger than the width of said fan and of said motor to permit removal of said motor and fan from said bag, and a cover removably secured over said open top and having an aperture for the passage of compressed air, said passage being smaller than the width of said motor and fan to restrain accidental removal of the motor and fan out of said bag.

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