A telescopic sound box

Field of the invention

The present invention relates to a telescopic sound box.

Background of the invention

As the necessary equipment for electronic sound transforming, the sound box has been development for a long time. Considering the range of the wave length of sound, to obtain better resonance and better efficacy of the electromagnet speaker, the physical dimension has to be coupled to the wave length. So that the effect of the sound box, especially the reduction effect of the alto and bass range, requires enough size of the sound box.

With the development of the portable and multi-media equipment to be lighter and thinner, the size and the physical dimension of the sound box of the equipment are correspondingly limited. so the acoustic of the bass range is weakened. If the audio output of the portable and multi-media equipment needs, it requires an external sound box. However, the external sound box with better acoustic is of large size. Disadvantage remains in the portable feature.

Summary of the invention

To overcome the disadvantage of the portable sound box that the portability is limited by the size, the present invention is provided with a telescopic sound box. The technical proposal of the present invention is as below:

A telescopic sound box includes:

Several coaxial expansion sections, each two neighbor expansion sections are connected by an elastic section made of elastic material, formed an expansion body by the expansion sections series connected in order;

A speaker, which is loaded on the bottom surface of the expansion section in one end of the expansion body;

The expansion body has a compressive state and an expanding state; in the compressive state, each elastic section and its expansion section overlap in the axial direction; in the expanding state, each elastic section and its expansion section are axial distributed; the expansion body is disposed with a lockable air valve as the air way in the expansion body inside and outside.

In another preferred embodiment, the external diameters of the expansion sections of the expansion body is gradually decreased or increased in the axial direction, making the expansion body with a large end and a small end; in the compressive state, start from the small end, each expansion section is sleeved inside the later one.

In another preferred embodiment, the expansion body is shaped with small middle and two large ends, the external diameter of the middle of the expansion body is smallest in the axial direction, the external diameters of the two large ends are gradually increased in the axial direction.

In another preferred embodiment, the speaker is fixed on the bottom surface of the large end of the expansion body; a passive diaphragm of resonance with the speaker is fixed on the bottom surface of the small end of the expansion body.

In another preferred embodiment, two speakers and two passive diaphragms of resonance with the corresponding speaker are separately fixed on the bottom surface of the corresponding expansion sections in the two ends of the expansion body.

In another preferred embodiment, the expansion section in the middle of the expansion body is disposed with a hinge to connect to the rack on the external wall of the expansion section; the rack

is formed same with the outer wall of the expansion section when the rack and the expansion section coordinate, the end of the rack is disposed with a baffle which a portable equipment can be fixed to.

In another preferred embodiment, the expansion sections and the elastic sections are once formed of same material, the expansion section is thicker than the elastic section.

In another preferred embodiment, the inner wall of the elastic section is disposed with strengthen steel ring.

In another preferred embodiment, bottom surface of the expansion section of the speaker is fixed to the bottom surface of the portable equipment, when the expansion body is laterally placed on the desk, the expansion body is served as the supporting base of the portable equipment.

In another preferred embodiment, the expansion sections and the elastic sections are made of visible material, an illumination source is disposed inside the expansion body, making the expansion body served as a night light of luminescence.

In another preferred embodiment, the chassis rack and the chassis of the speaker are made of visible material of same color with the expansion body.

In another preferred embodiment, the expansion body is disposed with a light window to couple to the illumination source to admit illumination when the expansion body is situated in the compressive state.

In another preferred embodiment, the expansion body is disposed with a battery and a radio reception module of the speaker inside.

In another preferred embodiment, the air valve is normal suction non return valve, the non return limit can be released by hand.

The advantageous effects of the technical proposal are as below:

1. the telescopic sound box is applied with an expansion body formed of expansion sections and elastic sections, the sound box has enough size and it can be compressed. The elastic section is made of flexible material to connect the expansion section. So that in the expanding state, the size of the resonance space inside the expansion body is stable when the speaker works, and it provides with well anti-deformation capacity.

2. The elastic section is connected between the expansion sections, making the expansion body easily and quickly once formed with low cost.

3. The expansion body can be served as a rack or supporting for the portable equipment.

Brief description of the drawings

The present embodiment will be further described with the drawings and embodiments.

Fig.1 illustrates the side view of the first embodiment of the present invention in the expanding state.

Fig.2 illustrates the side view of the first embodiment of the fig.1 in compressive state.

Fig.3 illustrates the side view of the first embodiment of the fig.1 applied in portable equipment 40.

Fig.4 is the front view of the fig.3.

Fig.5 illustrates the side view of the second embodiment of the present invention.

Fig.6 illustrates the front view of the second embodiment of the fig.5 applied in portable equipment 40.

Fig.7 illustrates the side view of the third embodiment in the expanding state.

Fig.8 illustrates the side view of the third embodiment of the fig.7 in the compressive state.

Fig.9 illustrates the front view of the third embodiment of the fig.7 applied in portable equipment 40.

Fig.10 illustrates the side view of the forth embodiment of the present invention in expanding state.

Fig.11 illustrates the structure of forth embodiment of the fig.10 between the expanding state and the compressive state.

Fig.12 is Fig 7 and Fig 8 that illustrates two different states.

Detailed description of the embodiment

The first embodiment:

Refer to the fig.1 to fig.4, which illustrate the structure of the first embodiment.

The first embodiment is disposed with an expansion body 1, which has three expansion sections, the top expansion section 11, the middle expansion section 12 and the bottom expansion section 13. Each two neighbor expansion sections of these three expansion sections are connected by an elastic section 20, from the top expansion section 11 to the bottom expansion section 13. They are sealing and serious connected in order. Fig.1 illustrates the expanding state of the expansion body 1.

A speaker 30 is fixed on the bottom surface of the top expansion section 11. The chassis of the speaker 30 is faced outward and loaded on the bottom surface of the expansion section 11 by front loading.

Fig.1 illustrates the completely expansion state of the expansion body 1. Each elastic section and its expansion section are distributed in the axial direction without overlap, forming the maximum size of the elastic section 20 and the expansion section, the internal space of the expansion body 1 is served as the resonance space of the speaker 30.

Refer to the fig.2 of the first embodiment in compressive state. In this state, each elastic section 20 and its expansion section, no matter the top expansion section 11, the middle expansion section 12 or the bottom expansion section 13, overlap in the axial direction. When the elastic section 20 laps in the axial direction, the expansion body 1 is compressed in the axial direction.

During the conversion of the expansion body 1 in the compressive state and the expanding state, the volume of the inner space changes, so the air inside has to be adjusted for pressure balance inside and outside. This embodiment is applied with a lockable air valve 2. When the expansion body 1 is conversed between the compressive and expanding state, the air valve 2 is opened to allow the air inlet and outlet.

It’s clear that with the expansion body 1 of the expansion section and the elastic section, a sound box with a compressible volume is provided. The sound box with enough volume can be compressed. And the elastic section 20 is made of flexible material to connect the expansion section one by one. So that in the expanding state, the size of the resonance space inside the expansion body is stable when the speaker 30 works, and it provides with well anti-deformation capacity. The sound box has well portable performance,

Refer to the fig.3 and fig.4 of the first embodiment applied in the portable equipment 40. the external diameters of the expansion sections of the expansion body 1 from the top expansion section 11 to the bottom expansion section 13 are gradually decreased in the axial direction, making the expansion body 1 with a large end and a small end. In the compressive state, start from the small end, each expansion section is sleeved in its later one, making the expansion body 1 with

well strength in the compressive state.
So that when the expansion body 1 is laterally placed on the plane, the speaker 30 is inclined and placed. The bottom surface of the top expansion section 11 of the speaker 30 is fixed to the bottom surface of the portable equipment 40 to be served as the support base of the portable equipment 40 when the expansion body 1 is laterally placed on the desk. The expansion body 1 has well reduction performance and it provides support to the portable equipment 40. When this two are connected, it forms a proper group. The expansion body 1 of the embodiment is disposed with a radio Bluetooth module and a battery for charge, which realizes well matching with the portable equipment 40. This embodiment has other features. The expansion section and the elastic section are once formed from same material, and the expansion section is thicker than the elastic section. The manufactory is easy and the molding is quick.

The second embodiment:
Refer to the fig.5 and fig.6 of the second embodiment of the present invention.
The expansion body 1 of the second embodiment is similar to that of the first embodiment: the top expansion section 11, the middle expansion section 12 and the bottom expansion section 13 are connected by the elastic section 20, forming a structure of gradually narrow from the large end to small end. On the bottom surface of the top expansion section 11, a speaker 30 is loaded. Different from the first embodiment, a passive diaphragm 50 is disposed on the bottom surface of the bottom expansion section 13. the passive diaphragm 50 is of resonance with the speaker 30 in the bass range, realizing well alto and bass effect. It enhances the resonance performance, making it grater choice in the expansion body 1 space and the speaker 30.
Refer to the fig.6 of two expansion bodies 1 applied in portable equipment 40. Similar to the first embodiment to be served as a support, it makes the portable equipment 40 with better operation. In the other hand, with the left and right track, the stereophonic atmosphere is better. Especially, the inner wall of the elastic section 20 is disposed with strengthen steel ring, making it with well anti-reduction in expanding state and reliably conversion of the expanding and compressive state.

The third embodiment:
Refer to the fig.1 and fig.8 of the third embodiment of the present invention.
The expansion body 1 of this embodiment has a small middle and two large ends in the axial direction. The expansion section is situated in the middle in the axial direction. That is to say, the external diameter of the expansion section 12 is smallest. Other expansion sections are gradually enlarged toward the two ends in the axial direction. In the two large ends of the expansion body 1, the two top expansion bodies 11 are separately disposed with a speaker 30 and a passive diaphragm 50 of resonance with the speaker 30 on the bottom surface.
It is clear that the expansion body 1 of this embodiment is of symmetry. When in the compressive state in the fig.8, the top expansion section 11 and the bottom expansion section 13 are formed to be a container to contain the other expansion sections and elastic sections with small size. In the other hand, the length of the speaker 30 is larger in the axial direction. So that it limits little to the speaker 30 with well applicability and the speaker 30 does not need to be shaped thin. As the large ends, the top expansion section 11 and the bottom expansion section 13 form an excellent base with stability when the expansion body 1 is situated in the expanding state.
The middle expansion section 12 in the middle of the expansion body 1 is disposed with a rack 3,

which is applied with a hinge to connect to the outer wall of the middle expansion section 12. The rack 3 can be turned up. The rack 3 forms same with the outer wall of the middle expansion section 12 when they coordinate. The end of the rack 3 is disposed with a baffle 4 which the portable equipment can be fixed to. As seen from the fig.9, the rack 3 is faced downward and turned up with the baffle 4 to support the portable equipment 40, making the expansion body 1 a shaped uniquely stand and a high performance and portable sound box.

Other advantages of this embodiment are below: the expansion sections and the elastic sections are made of visible material; an illumination source is disposed inside the expansion body 1, and the chassis rack 31 and the chassis 32 of the speaker 30 are made of visible material of same color with the expansion body 1. A semitransparent material with a gentle glow is better. The expansion body 1 can be served as a night light of luminescence with lighting function.

The forth embodiment:

Refer to the fig.10 and fig.11 of the forth embodiment of the present invention.

Similar to the third embodiment, the expansion body 1 is shaped with a small middle and two large ends in the axial direction. The expansion section 12 is disposed in the middle in the axial direction with the smallest external diameter. The external diameters of other expansion sections are gradually increased toward the two ends of the expansion body 1 in the axial direction. in the two large ends of the expansion body 1, the two top expansion bodies 11 are separately disposed with a speaker 30 and a passive diaphragm 50 of resonance with the speaker 30 on the bottom surface. Similarly, the expansion body 1 of this embodiment is of symmetry. When in the compressive state, the top expansion section 11 and the bottom expansion section 13 are formed to be a container to contain the other expansion sections and elastic sections with small size.

In this embodiment, the expansion body 1 is disposed with an illumination source 60, which is placed in a special position. A light window 51 of illumination is disposed on the passive diaphragm 50. When the bottom expansion section 13 and the middle expansion section 12 are relatively compressed, light is transmitted through the light window 51 without stopped by the inner wall of the expansion body 1. The expansion body 1 is made of a diffused transmission material, so this embodiment can be served as an appliance with double illumination functions. When the expansion body 1 is situated in the expanding state, light of the illumination source 60 casts inside the expansion body 1 and diffused out to make the expansion body a night light of luminescence. When the expansion body 1 is situated in the compressive state, light of the illumination source 60 casts without adjust, making the expansion body 1 a spotlighting.

Although the present invention has been described with reference to the preferred embodiments thereof for carrying out the patent for invention, it is apparent to those skilled in the art that a variety of modifications and changes may be made without departing from the scope of the patent for invention which is intended to be defined by the appended claims.

Claims

Claim 1. A telescopic sound box, wherein includes:

Several coaxial expansion sections, each two neighbor expansion sections are connected by an elastic section made of elastic material, formed an expansion body by the expansion sections series connected in order;

A speaker, which is loaded on the bottom surface of the expansion section in one end of the expansion body;

The expansion body has a compressive state and an expanding state; in the compressive state, each elastic section and its expansion section overlap in the axial direction; in the expanding state, each elastic section and its expansion section are axial distributed; the expansion body is disposed with a lockable air valve as the air way in the expansion body inside and outside.

Claim 2. a telescopic sound box according to the claim 1, wherein the external diameters of the expansion sections of the expansion body is gradually decreased or increased in the axial direction, making the expansion body with a large end and a small end; in the compressive state, start from the small end, each expansion section is sleeved inside the later one.

Claim 3. a telescopic sound box according to the claim 1, wherein the expansion body is shaped with small middle and two large ends, the external diameter of the middle of the expansion body is smallest in the axial direction, the external diameters of the two large ends are gradually increased in the axial direction.

Claim 4. A telescopic sound box according to the claim 2, wherein the speaker is fixed on the bottom surface of the large end of the expansion body; a passive diaphragm of resonance with the speaker is fixed on the bottom surface of the small end of the expansion body.

Claim 5. A telescopic sound box according to the claim 3, wherein two speakers and two passive diaphragms of resonance with the corresponding speaker are separately fixed on the bottom surface of the corresponding expansion sections in the two ends of the expansion body.

Claim 6. A telescopic sound box according to the claim 5, wherein the expansion section in the middle of the expansion body is disposed with a hinge to connect to the rack on the external wall of the expansion section; the rack is formed same with the outer wall of the expansion section when the rack and the expansion section coordinate, the end of the rack is disposed with a baffle which a portable equipment can be fixed to.

Claim 7. A telescopic sound box according to the claim 1, claim 2, claim 3, claim 4, claim 5 or claim 6, wherein the expansion sections and the elastic sections are once formed of same material, the expansion section is thicker than the elastic section.

Claim 8. A telescopic sound box according to the claim 1, claim 2, claim 3, claim 4, claim 5 or claim 6, wherein the inner wall of the elastic section is disposed with strengthen steel ring.

Claim 9. A telescopic sound box according to the claim 1, claim 2, claim 3, claim 4, claim 5 or claim 6, wherein bottom surface of the expansion section of the speaker is fixed to the bottom surface of the portable equipment, when the expansion body is laterally placed on the desk, the expansion body is served as the supporting base of the portable equipment.

Claim 10. A telescopic sound box according to the claim 1, claim 2, claim 3, claim 4, claim 5 or claim 6, wherein the expansion sections and the elastic sections are made of visible material, an illumination source is disposed inside the expansion body, making the expansion body served as a night light of luminescence.

Claim 11. A telescopic sound box according to the claim 10, wherein the chassis rack and the chassis of the speaker are made of visible material of same color with the expansion body.

Claim 12. A telescopic sound box according to the claim 10, wherein the expansion body is disposed with a light window to couple to the illumination source to admit illumination when the expansion body is situated in the compressive state.

Claim 13. A telescopic sound box according to the claim 1, claim 2, claim 3, claim 4, claim 5 or claim 6, wherein the expansion body is disposed with a battery and a radio reception module of the speaker inside.

Claim 14. A telescopic sound box according to the claim 1, claim 2, claim 3, claim 4, claim 5 or claim 6, wherein the air valve is normal suction non return valve, the non return limit can be released by hand.