United States Patent

Glasser

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[45] **Oct. 24, 1972**

[54] **STRINGED MUSICAL INSTRUMENT**

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[52] **U.S. Cl.** .....**84/291,** 84/452 P

[51] **Int. Cl.**.....**G10d 3/00**

[58] **Field of Search**....84/291, 275, 267, 274, 452 R, 84/452 P, 290

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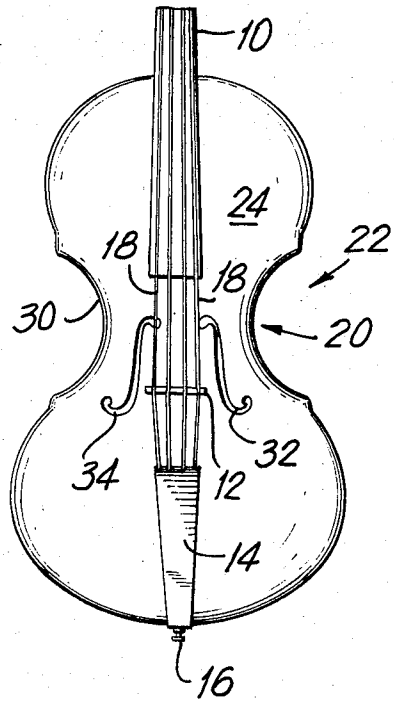
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[57] **ABSTRACT**

A stringed musical instrument such as a violin resembling a more expensive one in appearance and sound. The sound box portion of the violin includes top, bottom, and side walls which are formed by a plurality of woven, resin impregnated fiberglass sheets being in number between five and nine and in thickness between 0.006 to 0.009 inches. An outer layer of impregnated wood grained paper is heat-sealed to the fiberglass plies, forming the outer surface of the sound box. This outer surface takes on the appearance of a grainy wood finish, thereby resembling natural wood violins.

14 Claims, 6 Drawing Figures



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SHEET 1 OF 2

FIG. 1

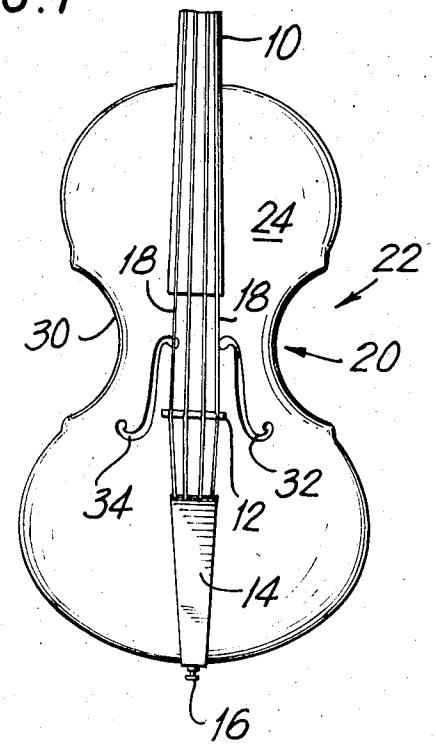


FIG. 2

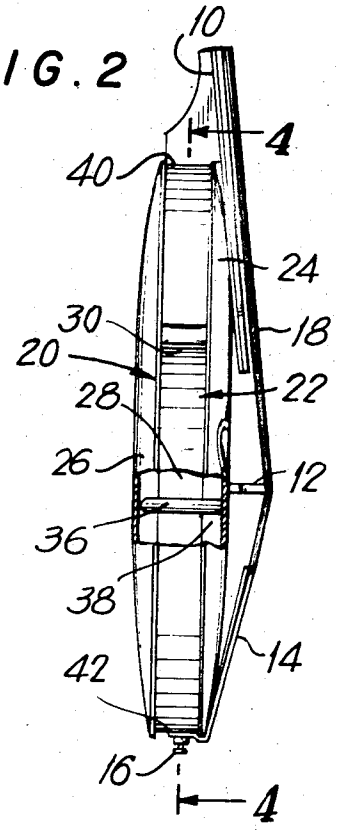
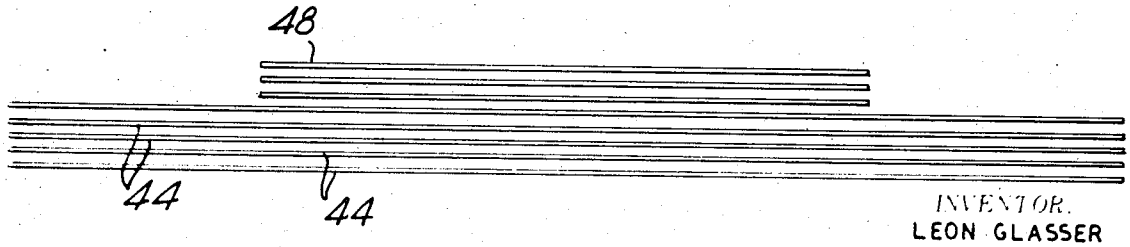


FIG. 3



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FIG. 4

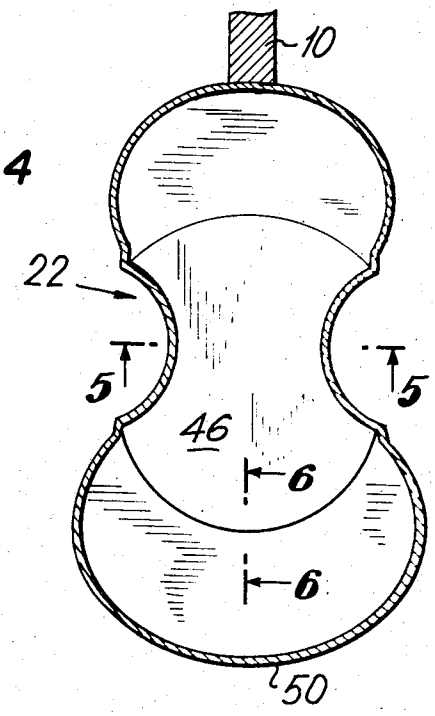


FIG. 5

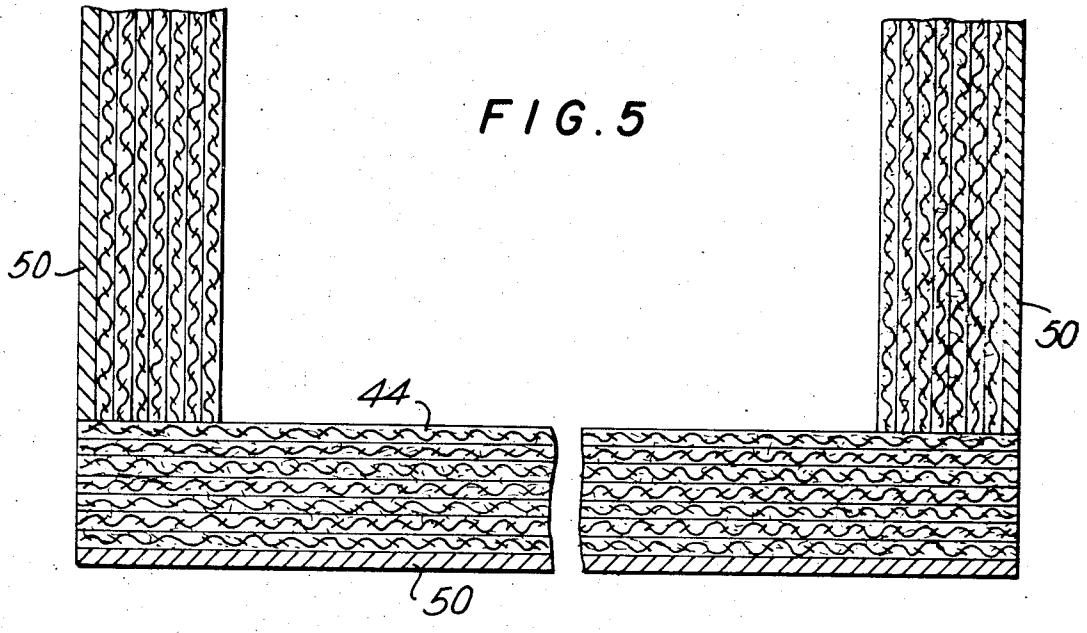
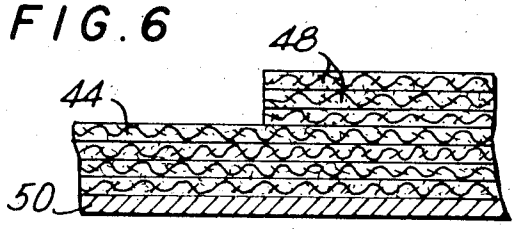


FIG. 6



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STRINGED MUSICAL INSTRUMENT

BACKGROUND OF THE INVENTION

This invention relates to an improved stringed musical instrument, and more particularly to a stringed instrument providing an improved sound. Stringed instruments such as guitars, fiddles, violins and the like have existed for a long time. Such instruments generally provide a satisfactory tone, but yet over the years many attempts have been made to improve the resonance of the sounds produced.

Most of these efforts have been directed towards portions of the instrument other than the main sound box. In particular, auxiliary parts of the violin and like instruments have been modified and rearranged, with such modifications directed towards improving the resulting sounds and tones. Such changes, which have been altering the appearance of the stringed instruments, are generally expensive, complex and confusing.

Many of these instruments are made of wood and are relatively delicate requiring extremely careful handling. As a result of their fragile nature, frequently they are easily damaged and destroyed. In addition, instruments providing a rich tone tend to be relatively expensive.

An object of the present invention is to provide a stringed instrument producing richer tones and sounds.

Another object of the present invention is to provide a stringed instrument embodying modifications in structure which are not obvious to the musician.

Still another object of the present invention is to provide a relatively inexpensive stringed instruments which simulates the more expensive item and provides tones as deep and resonant as those obtained with such expensive instruments.

Yet another object of the present invention is to provide a stringed instrument which is substantially stronger in construction than those previously manufactured.

Another object of the present invention is to provide a modification for stringed instruments which is relatively adaptable to any of a number of such instruments.

Other objects, advantages and features of the present invention will become more apparent from the following description.

SUMMARY OF THE INVENTION

In accordance with the principles of the present invention, the above objects are accomplished by constructing a violin or the like using laminations of fiberglass and resin in the main sound box with the laminations being of such number and thickness to provide rich and deep tones for the instrument. Heat is applied to bond the resin to the frame of the sound box which simultaneously causes the fiberglass laminations to bond together and also to the frame.

It may be recognized that the general appearance of the modified violin is the same as that obtained previously. The musician will not be aware of any construction changes, but will be immediately aware of the improved sounds obtained therewith.

In accordance with another feature of the present invention, a simulated grainy wood appearance is provided which resembles that of more expensive violins. An impregnated wood grained paper embodying these visual characteristics is bonded to the fiberglass and resin layers providing an attractive, durable, yet relatively inexpensive instrument which is capable of producing unusually good sounds.

IN THE FIGURES

FIG. **1** is a top view of a violin, with the outer portion of the finger board section broken away.

FIG. **2** is a side view of the violin shown in FIG. **1**.

FIG. **3** is a side view of the fiberglass laminations which are attached to the inner walls of the main sound box section of the violin.

FIG. **4** is a sectional view taken along lines **4—4** of FIG. **2** illustrating the internal arrangement of these laminations.

FIG. **5** is a sectional view taken along lines **5—5** of FIG. **4** illustrating the laminations in the central portion of the sound box.

FIG. **6** is a partial sectional view taken along lines **6—6** of FIG. **4** illustrating the arrangement of laminations utilized with the present invention.

DETAILED DESCRIPTION

Referring particularly to FIG. **1**, there is shown a violin which is conventional in appearance having a finger board **10**, a bridge **12**, a tail piece **14**, a button **16**, strings **18**, and bouts **20**. These parts are attached to and carried on a sound box **22** including an outwardly bulging rounded upper sound board **24** and an outwardly bulging rounded lower sound board **26**, connected by a ribbon-like vertical side wall in two sections, **28** and **30**. The side walls are curved to fit the profile of the upper and lower sound boards **24** and **26** but are vertically straight. The upper sound board **24** has the usual pair of sound holes **32** and **34** and an internal sound rod **36** extending between the upper and lower sound boards. In addition, a sound plate **38** is secured to the inner face of the upper sound board **24** which is conventional as are the neck lock **40** and the tail block **42**.

The present invention is shown with a violin. Other stringed instruments such as a viola, cello, bass, guitar and sitar may be beneficially formed in accordance with the principles of the present invention. Conventional stringed instruments are formed of a natural wood whose characteristics enable quality tones and sounds to be produced when the instrument is played.

The sound box as described above includes upper and lower sound boards or walls **24** and **26** and side walls **28** and **30**. In accordance with the principles of the present invention, a plurality of plies is used to form each of these walls with each ply being secured to the other. In particular, and as seen in FIGS. **3**, **5** and **6**, each ply **44** is formed of a woven fiberglass sheet being impregnated with 25–30 percent resin. The fiberglass is of a square weave of a uni-directional type. The resin, preferably, is extremely hard, the purposes of which will be explained hereinafter.

Each ply, preferably, is between 0.006 and 0.009 inches thick and between five and nine layers are utilized. If each ply were too thin, an insufficient amount of resin would be absorbed, resulting in a hollow type sound. Where the ply or layer is too thick, it is incapable of great movement, and a muted or faint sound is produced. It has been found that with each layer being

0.007 inches thick, an extremely good quality resonant tone is produced, while with a base thickness of 0.040–0.075 inches, a relatively acceptable quality tone is produced.

The plies or layers forming the sound box are applied simultaneously and heated in a mold to bond the resin and fiberglass layers together and to the body or frame of the sound box. The sound box includes a central section **46** and additional center layers or plies **48** may be utilized being located in this central section. There may be one to four additional layers to build up the center section so that it is approximately 0.020 inches thicker than the remaining portions of the sound box. The additional center layers may be located anywhere within the laminated structures, that is, it may be the first or last or any layer in between. It should be noted that the resin serves to bond the layers together and this resin, preferably, dries extremely hard. When a soft-drying resin is utilized, the sound produced is unsatisfactory.

A significant problem attendant prior art violins which produce the type sound achieved with the present invention relates to their expense and fragile nature. This results primarily from the quality of wood utilized in forming the sound box. In accordance with a principle of the present invention, the outer surface **50** of the sound box is formed by using a wood grained paper impregnated formaldehyde melamine which is capable of taking on the appearance of a natural grain wood. The outer surface **50** is heat-sealed to the plurality of plies or layers through the resin which impregnates into the wood layer.

To provide the appearance of a high-quality violin, a curly maple may be utilized for the backs and the sides while a spruce may be utilized for the top.

It may be appreciated that the present invention enables a high-quality violin to be produced which is relatively inexpensive, extremely sturdy which embodies the best of both worlds. The weight of the violin produced may be approximately 440 grams including the handle and string assembly.

It will be appreciated that the desired Cremona tone is an effect that is rarely achieved in wood violins by reason of the fact that no two pieces of wood are of like construction so that the tone will vary from violin to violin. It is for this reason that violins by the greatest of makers such as Amati, Stradivarious, or Guarnerious have not all been up to the standards sought to be achieved. While each of these makers provide masterpieces, the number or percentage of masterpiece instruments having the pure Cremona tone are minimal in proportion to the number produced.

It is a primary object of this invention and one which has been achieved, to provide a violin construction such as will produce the finest Cremona tone uniformly in all instruments.

An analysis of masterpiece instruments by X-ray or an other device will show that there is a variation in what may be termed as the refraction patterns of the genes and cells in the woods. While others have produced violins of synthetic material including lay ups of fiberglass, no one has heretofore achieved and obtained uniform quality of the best Cremona tone.

It will be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above article without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A stringed musical instrument having a sound box portion, said sound box portion comprising a bottom wall, side walls and a top wall, said side, top and bottom walls being provided with a plurality of plies each of said plies comprising a fiberglass sheet, the central section of at least one of said top or bottom walls having at least one additional ply secured to said plurality of fiberglass plies, said additional ply being disposed in said central section of said sound box so that said central section wall thickness is greater than the thickness of the remaining portion of said sound box; said fiberglass sheets being impregnated with a resin, and said resin bonding said plies to said top, bottom, and side walls of said sound box.

2. A stringed instrument as set forth in claim **1**, wherein said fiberglass sheet is even woven of a square weave.

3. A stringed instrument as set forth in claim **2**, wherein said woven fiberglass is a square weave of a unidirectional type.

4. A stringed instrument as set forth in claim **1**, wherein the number of plies is between five and nine.

5. A stringed instrument as set forth in claim **4**, wherein the thickness of each ply is between 0.006 and 0.009 inches.

6. A stringed instrument as set forth in claim **1**, wherein the number of plies is seven and the thickness of each ply is approximately 0.007 inches.

7. A stringed instrument as set forth in claim **1**, wherein said additional ply is between 0.003 and 0.006 inches thick.

8. A stringed instrument as set forth in claim **1**, wherein said central section is approximately 0.020 inches thicker than said remaining portion.

9. A stringed instrument as set forth in claim **1**, wherein said resin is a hard-drying type.

10. A stringed instrument as set forth in claim **1**, wherein said each of said plurality of plies is formed of 25–30 percent resin.

11. A stringed instrument as set forth in claim **1**, wherein the outer surface of said sound box is formed by a wood grained paper material secured to said plurality of plies.

12. A stringed instrument as set forth in claim **11**, wherein said wood grained paper is impregnated with melamine formaldehyde.

13. A stringed instrument as set forth in claim **11**, wherein the appearance of said outer surface simulates natural wood.

14. A stringed instrument as set forth in claim **11**, wherein said wood grained paper is heat-sealed to said fiberglass plies.

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