June 2, 1970 P. D. BROUSSARD 3,515,024

STRINGED MUSICAL INSTRUMENT BODY CONSTRUCTION AND FINISH

Filed April 29, 1968 2 Sheets-Sheet 1

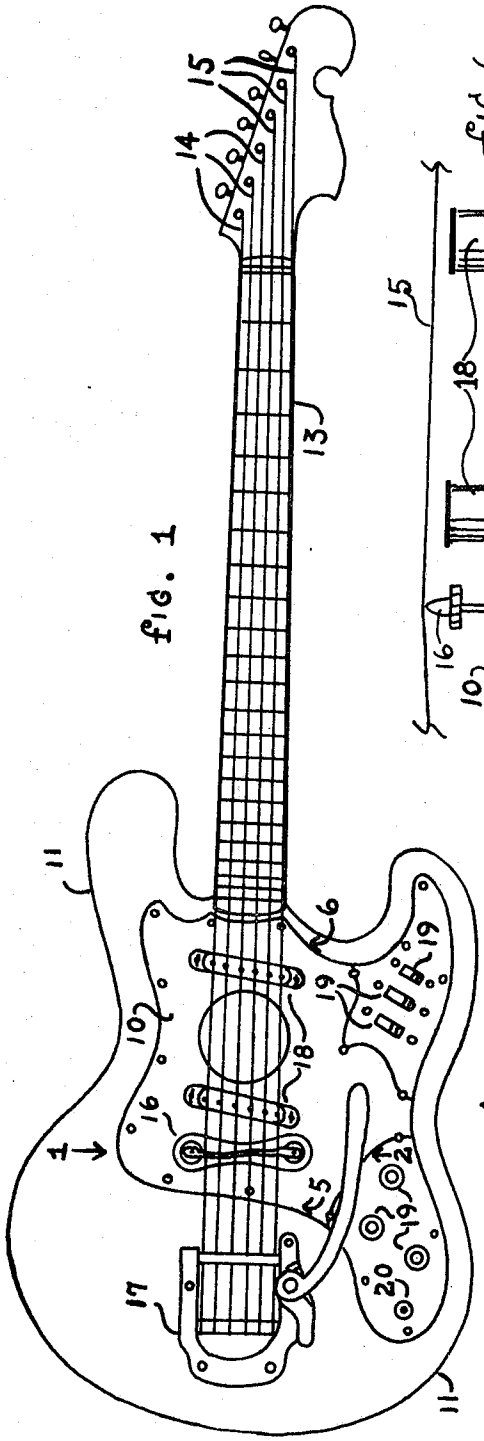

Fig. 1

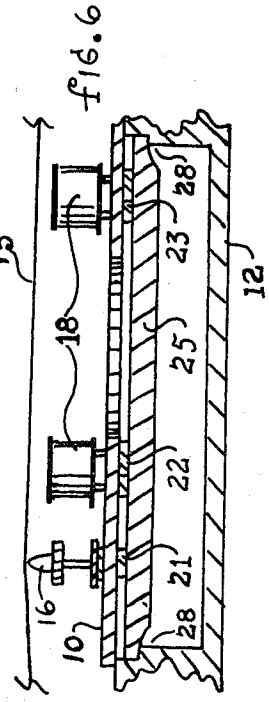

Fig. 6

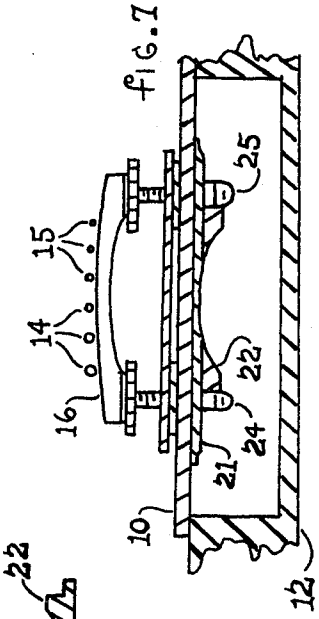

Fig. 7

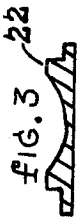

Fig. 3

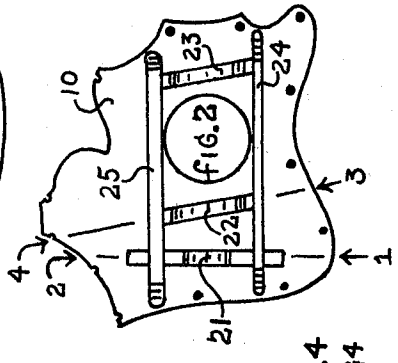

Fig. 2

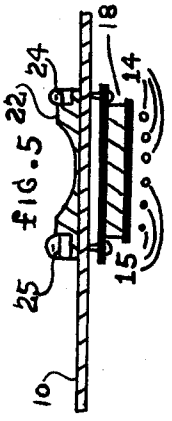

Fig. 5

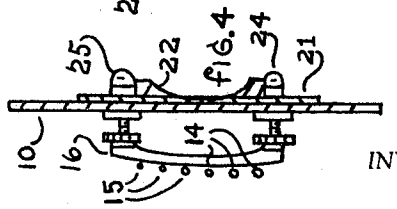

Fig. 4

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STRINGED MUSICAL INSTRUMENT BODY CONSTRUCTION AND FINISH

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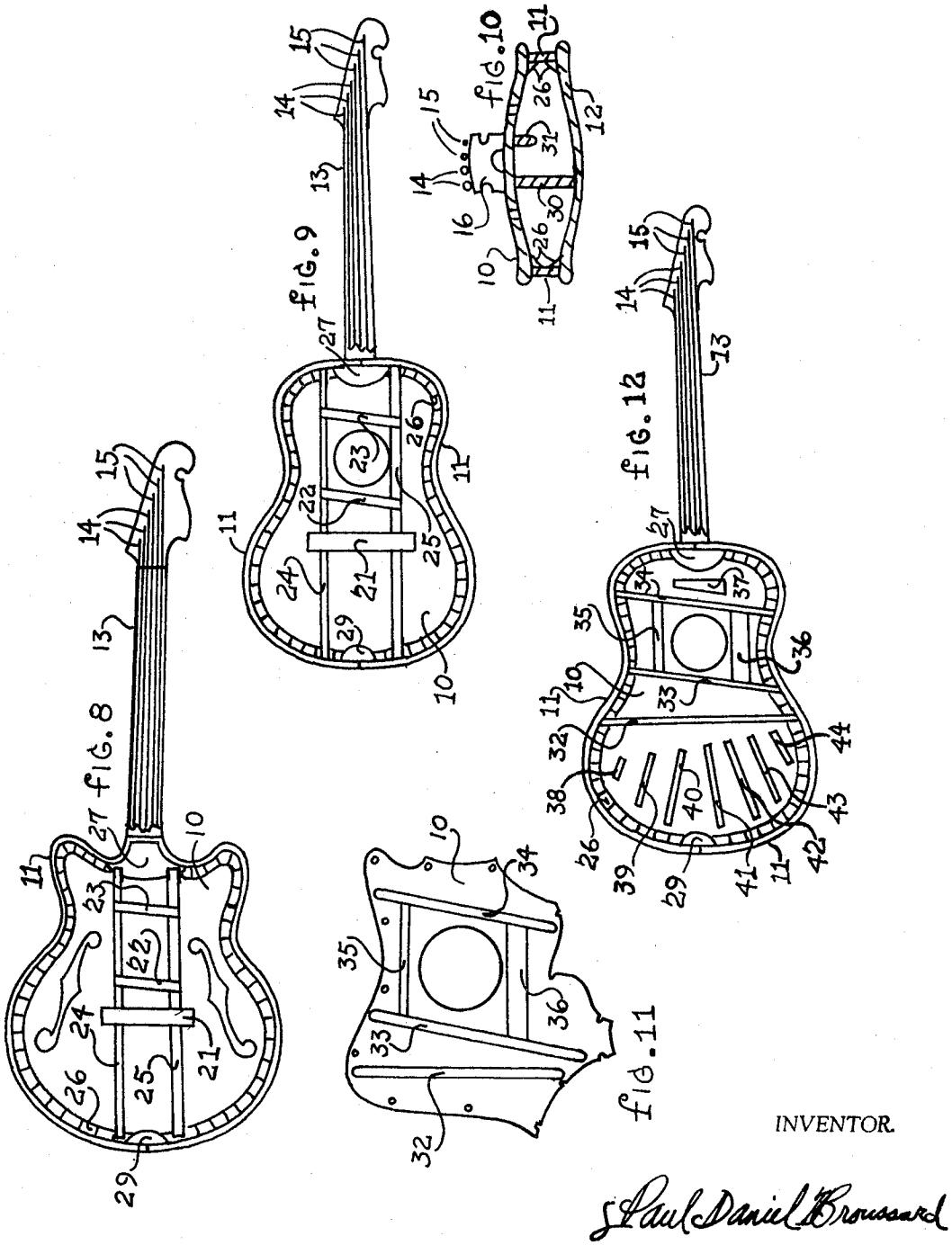

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STRINGED MUSICAL INSTRUMENT BODY CONSTRUCTION AND FINISH

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ABSTRACT OF THE DISCLOSURE

Basically, the treating of the bass and treble side of the resonator or soundboard of a stringed musical instrument unequally so as to provide improved sound response. Specific examples such as by applying fewer coats of finish to the bass side of the resonator of the instrument than the treble side, securing fewer fan struts to the resonator on the bass side of the instrument than on the treble side, using narrower struts positioned on the bass side of the resonator than counterpart struts positioned on the treble side of the resonator, using thinner struts positioned on the bass side of the resonator than counterpart struts positioned on the treble side of the resonator, reversing the respective position of the soundpost and bass bar, and wherein the wood grains of the resonator are spaced broader apart on the bass side of the resonator than the treble side.

This invention relates to the body construction and finish for a stringed musical instrument. In prior art the finish is not made to aid tone response and prior art instrument construction in most instances cause a decrease in bass response due to excessive vibrational restriction which also decreases the sound output of the instrument thus susceptible to substantial improvement.

It has been observed that thinner wood resonators produce a more bass response while thicker wood resonators produce a more treble response. A shorter wood resonator or soundboard on the treble side produces a more treble response while a longer wood resonator or soundboard on the bass side produces a more bass response. Similarly, a hollow body type instrument produces a more bass response while a solid body type instrument produces a more treble response. This is due to the resilience factor.

Resilience relates to the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress. This to a great degree controls string and tone response in a stringed musical instrument.

The resonator of a stringed musical instrument such as a guitar, a mandolin, a ukulele, a lute, a violin or related instrument is weak and not resilient enough, therefore, it has to be reinforced with a bass bar, a soundpost or strutted. If the said resonator is not reinforced enough, this increases the bass response while reducing the treble response of the instrument. If the resonator is reinforced excessively, this reduces the bass response while increasing the treble response of the instrument. If the bass and treble sides of the aforesaid resonator are equally reinforced, both the bass and treble response may not be increased due to the resilience factor.

For example, in a violin the resilience of the bass side equals and is predominantly controlled by the thickness of the resonator belly as well as the thickness of the bass bar. The resilience of the treble side equals and is predominantly controlled by the resonator belly and the back due to the soundpost. In prior art violins the thickness of the bass bar and the belly on the bass side of the resonator are greater than the combined thickness of the belly on the treble side of the resonator and the back resulting in a greater resilience on the bass side of the resonator than the treble side of the resonator thus opposing string and

tone response of the instrument. Therefore, in a violin, by reversing the position of the bass bar and the soundpost, it aids string and tone response. The bass bar and soundpost will hereafter be referred to as a bass post and a treble bar.

As used herein the bass side of the resonator relates to the bass strings and from the longitudinal center of the instrument resonator to its edges predominantly influenced by the bass strings of the instrument. The treble side of the resonator relates to the treble strings and from the longitudinal center of the instrument resonator to its edges predominantly influenced by the treble strings of the instrument.

It is therefore an object of the present invention to improve both the bass and treble response of a stringed musical instrument.

In the drawings:

FIG. 1 is a top plan view of the preferred embodiment incorporated in a semi-hollow body type instrument;

FIG. 2 is an undersurface view of the resonator of the instrument shown in FIG. 1;

FIG. 3 is an enlarged sectional view of struts **22** and **23** in FIG. 1;

FIG. 4 is an enlarged sectional view taken substantially along points **1–2** in FIG. 2;

FIG. 5 is an enlarged sectional view taken substantially along points **3–4** in FIG. 2;

FIG. 6 is an enlarged fragmentary sectional view taken substantially along points **5–6** in FIG. 1;

FIG. 7 is an enlarged fragmentary sectional view taken substantially along points **1–2** in FIG. 1;

FIG. 8 is a top plan view of the preferred embodiment showing the struts as would be seen applied in an F-hole hollow body type instrument with its back removed and, for illustrative purposes, a transparent face;

FIG. 9 is a top plan view of the preferred embodiment showing the struts as would be seen applied in a round hole hollow body type instrument with its back removed and, for illustrative purposes, a transparent top;

FIG. 10 is a cross sectional view of a modified form of embodiment applied in a violin or a similar instrument as would be seen at the bridge viewing from the tailpiece end incorporating a bass post and a treble bar;

FIG. 11 is a modified form of resonator for the semi-hollow body type instrument shown in FIG. 1 showing the struts for illustrative purposes as would be seen from above the surface of the resonator if the resonator were transparent; and

FIG. 12 illustrates the modified form illustrated in FIG. 11 showing the struts as would be applied in a round hole hollow body type instrument as would be seen with its back removed and, for illustrative purposes, a transparent top.

Referring to the drawings, in FIG. 1 the preferred embodiment incorporates a resonator or a face **10**, sides or ribs **11**, a back **12**, a neck **13** having tuning means, bass strings **14**, treble strings **15**, a bridge **16**, a tailpiece **17**, pickups **18**, controls **19** and a jack **20**.

The preferred embodiment shown in FIGS. 1, 2, 3, 4, 5, 6, 7, 8 and 9 incorporates a partial cross bridge strut **21** disposed perpendicular to the longitudinal axis of the instrument supporting the resonator **10**, partial cross struts **22** and **23** preferably disposed at an angle such as between five and fifty degrees from parallel to the partial cross bridge strut **21** supporting the resonator **10**, a bass strut **24** disposed parallel to the longitudinal axis of the instrument supporting the partial cross bridge strut **21** and the partial cross struts **22** and **23** on the bass side of the resonator **10**, and a treeble strut **25** disposed parallel to the longitudinal axis of the instrument supporting the partial cross bridge strut **21** and the partial cross struts **22** and **23** on the treble side of the resonator **10**. The bass strut

24 and the treble strut 25 as shown in FIG. 6 are supported by the routed grooves 28 at each end in a semi-hollow body type instrument while in a hollow body type instrument may be supported by the inside body lining 26 shown in FIGS. 8 and 9. Said bass strut 24 and the treble strut 25 may also be supported by the neck block 27 and the end block 29 shown in FIGS. 8 and 9. The partial cross struts such as the aforesaid struts 21, 22 and 23 are denfied as struts constructed not to significantly influence vibration while the aforesaid bass strut 24 is preferably thinner, narrower, longer and tapered longer while the treble strut 25 preferably is thicker, wider, shorter and tapered shorter thus significantly influencing vibration to improve both the bass and treble response of the instrument. It is to be noted that only the aforesaid partial cross bridge strut 21 and the patrial cross struts 22 and 23 directly support the resonator 10 so that the resonator 10 is not significantly influenced by such struts, whereas the bass strut 24 significantly influences the bass side of the resonator 10 lesser while the treble strut 25 significantly influences and restricts the treble side of the resonator 10 greater yet allowing all the other areas of the resonator 10 to vibrate freely to aid string and tone response as well as allow maximum resonator vibration for increasing and improving the sound output of the instrument.

The resonator 10 in all the figures and applying to all forms of embodiment, preferably should also place the wood grains of the lumber used to construct said resonator 10 in the following manner not illustrated in the drawings as it is not capable of being readily illustrated: Apply the close wood grains parallel to the longitudinal axis of the instrument predominantly on the treble side of the resonator 10 while placing the broader wood grains parallel to the longitudinal axis of the instrument predominantly on the bass side of the resonator 10. This may be done by placing the template of the instrument resonator 10 on the uncut piece of lumber which will be used for the resonator 10 so that the wood grains are as aforesaid then scribing around the master template.

The finish of the resonator 10 in all the figures and applying to all forms of embodiment, preferably should be finished in the following manner not illustrated in the drawings as it is not capable of being readily illustrated. Apply fewer coats of finish on the bass side of the resonator 10 while applying greater coats of finish on the treble side of the resonator 10 such as preferably five coats of finish to the treble side of the resonator 10 while applying three coats of finish to the bass side of the resonator 10. It is to be understood that finish relates to all types of finish such as varnish, shellac, lacquer or paint.

Referring to FIG. 10 showing a cross section of a modified form of embodiment applied to a violin or a similar instrument which incorporates a resonator 10, sides or ribs 11, a back 12, a bridge 16, bass strings 14, treble strings 15, the body lining 26, a bass post 30 and a treble bar 31. In FIG. 10 the cross section illustrated cannot show the instrument tailpiece and a neck having tuning means however it is to be understood that the instrument has a tailpiece 17 and a neck 13 having tuning means as shown in FIG. 1 or a similar set of such components.

Shown in FIGS. 11 and 12 a modified form of embodiment incorporates a partial treble strut 36 disposed parallel to the longitudinal axis of the resonator 10, a partial bass strut 35 disposed parallel to the longitudinal axis of the resonator 10, a cross bridge strut 32 disposed perpendicular to the longitudinal axis of the resonator 10, and cross struts 33 and 34 preferably placed at an angle such as between five and fifty degrees from parallel to the cross bridge strut 32. The partial bass strut 35 preferably should be thinner and narrower while the partial treble strut 36 should be thicker and wider. The cross bridge strut 32 and the cross struts 33 and 34 are not illustrated, as such, but may be preferably tapered narrower on the bass side of the resonator 10 while tapered wider on the treble side of the resonator 10.

The modified form of embodiment shown in FIG. 12 also incorporates a partial cross strut 37 disposed perpendicular to the longitudinal axis of the instrument. Said partial cross strut 37 preferably should be thinner and narrower on the bass side of the resonator 10 while being thicker and wider on the treble side of said resonator 10. In FIG. 12 the resonator 10 is also supported by fan struts 38, 39, 40, 41, 42, 43 and 44. Said fan struts preferably should be shorter and fewer on the bass side of the resonator 10 while on the treble side of the resonator 10 the fan struts should be longer and greater in number. The modified form shown in FIG. 12 also modified form shown in FIG. 12 also comprises bass strings 14, treble strings 15, a neck 13 having tuning means, the sides or ribs 11, the body lining 26, a neck block 27 and an end block 29.

It is to be understood the present invention may be incorporated in a guitar, a violin, a ukulele, a lute, a mandolin, a hollow body type instrument, a semi-hollow body type instrument, a flat top type instrument, an arched type instrument, a right hand type instrument, a left hand type instrument or a related musical instrument.

The foregoing is considered as illustrative of the principles of the invention, further, since modifications and changes may readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and finish described, and accordingly all such suitable modifications and equivalents may be resorted to without falling beyond the scope of the present invention.

I claim:

1. In a stringed musical instrument comprised of a resonator, sides, a back, bass strings, treble strings, a neck having tuning means extending outwardly at one end from the face of the instrument, a partial cross bridge strut disposed perpendicular to the longitudinal axis of the instrument supporting the resonator at the bridge, partial cross struts supporting the resonator in the region between the bridge and the neck, a bass strut disposed parallel to the longitudinal axis of the instrument supporting the partial cross bridge strut and the partial cross struts on the bass side of the resonator, said bass strut being supported at each end by a securing means, a treble strut disposed parallel to the longitudinal axis of the instrument supporting the partial cross bridge strut and the partial cross struts on the treble side of the resonator, said treble strut being supported at each end by a securing means for influencing, increasing, and improving the bass and treble response of the stringed musical instrument.

2. The combination defined in claim 1, wherein the partial cross struts supporting the resonator in the region between the bridge and the neck are disposed at an angle from parallel to the partial cross bridge strut.

3. The combination defined in claim 2, wherein the angle the partial cross struts are placed from parallel to the partial cross bridge strut is between five and fifty degrees.

4. The combination defined in claim 1, wherein the bass strut is thinner than the treble strut.

5. The combination defined in claim 1, wherein the bass strut is narrower than the treble strut.

6. The combination defined in claim 1, wherein the bass strut is longer than the treble strut.

7. The combination defined in claim 1, wherein the securing means is a groove.

8. The combination defined in claim 1, wherein the securing means is a body lining.

9. The combination defined in claim 1, wherein the securing means comprises a neck block supporting the bass and treble struts at the ends of the struts nearest the neck, and an end block supporting said struts at their opposite ends.

10. The combination defined in claim 1, wherein the wood grains of the resonator are spaced broader apart on the bass side of the instrument than the wood grains of the resonator on the treble side of the resonator.

11. The combination defined in claim 1, wherein fewer coats of finish are applied to the bass side of the resonator than are applied to the treble side of the resonator.

12. The combination defined in claim 1, wherein the bass strut restricts the bass side of the resonator lesser than the treble strut restricts the treble side of the resonator.

13. In a stringed musical instrument comprised of a resonator, ribs, a back, bass strings, treble strings, a neck having tuning means extending outwardly at one end from the face of the instrument, a bass post positioned between the undersurface of the resonator and the innersurface of the back on the bass side of the instrument, and a treble bar secured to the undersurface of the resonator on the treble side of the instrument for influencing, increasing and improving the bass and treble response of the stringed musical instrument.

14. The combination defined in claim 13, wherein the wood grains of the resonator are spaced broader apart on the bass side of the resonator than on the treble side of the resonator.

15. The combination defined in claim 13, wherein fewer coats of finish are applied to the bass side of the resonator than are applied to the treble side of the resonator.

16. In a stringed musical instrument comprised of a resonator, sides, a back, bass strings, treble strings, a neck having tuning means extending outwardly at one end from the face of the instrument, a cross bridge strut disposed perpendicular to the longitudinal axis of the instrument supporting the resonator at the bridge, cross struts disposed at an angle from the cross bridge strut supporting the resonator, a partial bass strut disposed parallel to the longitudinal axis of the resonator supporting the resonator on the bass side of said resonator, a partial treble strut disposed parallel to the longitudinal axis of the resonator supporting the resonator on the treble side of said resonator, a partial cross strut disposed

perpendicular to the longitudinal axis of the instrument supporting the resonator, and fan strut supporting the resonator for influencing, increasing and improving the bass and treble response of the stringed musical instrument.

17. The combination defined in claim 16, wherein the partial bass strut is narrower than the partial treble strut.

18. The combination defined in claim 16, wherein the partial bass strut is thinner than the partial treble strut.

19. The combination defined in claim 16, wherein the partial cross strut is thinner on the bass side of the resonator than the partial cross strut on the treble side of the resonator.

20. The combination defined in claim 16, wherein the partial cross strut is narrower on the bass side of the resonator than the partial cross strut on the treble side of the resonator.

21. The combination defined in claim 16, wherein there are fewer fan struts to support the bass side of the resonator than there are fan struts to support the treble side of the resonator.

22. The combination defined in claim 16, wherein the fan struts supporting the bass side of the resonator are shorter than the fan struts supporting the treble side of the resonator.

23. The combination defined in claim 16, wherein the wood grains of the resonator are spaced broader apart on the bass side of the resonator than the wood grains of the resonator on the treble side.

24. The combination defined in claim 16, wherein fewer coats of finish are applied to the bass side of the resonator than are applied to the treble side of the resonator.

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