

[54] **STRINGED MUSICAL INSTRUMENT WITH ALUMINUM MADE INTEGRAL UNIT**

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[51] Int. Cl.<sup>2</sup>... **G10H 3/00**; G10D 3/00; G10D 3/02

[58] Field of Search ..... 84/267, 291, 292, 293, 84/299, 1.16, 294, 314

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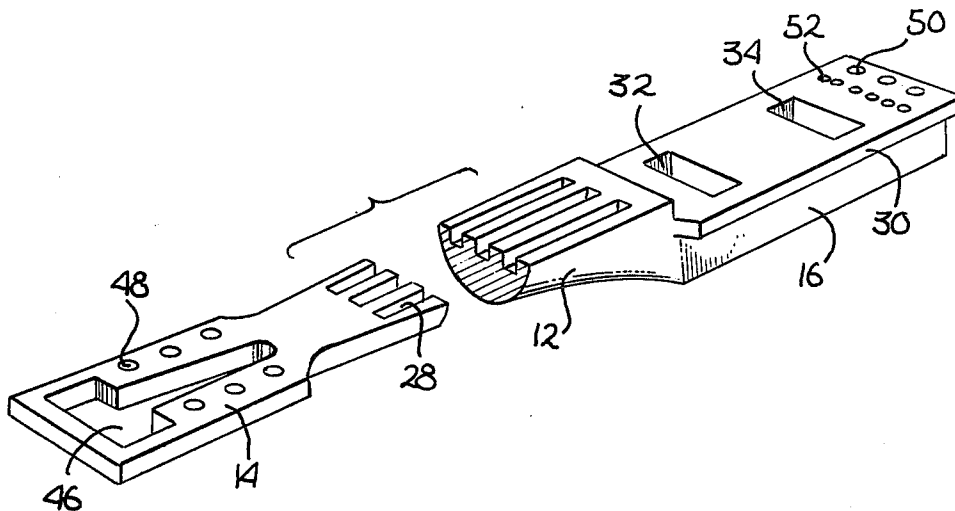
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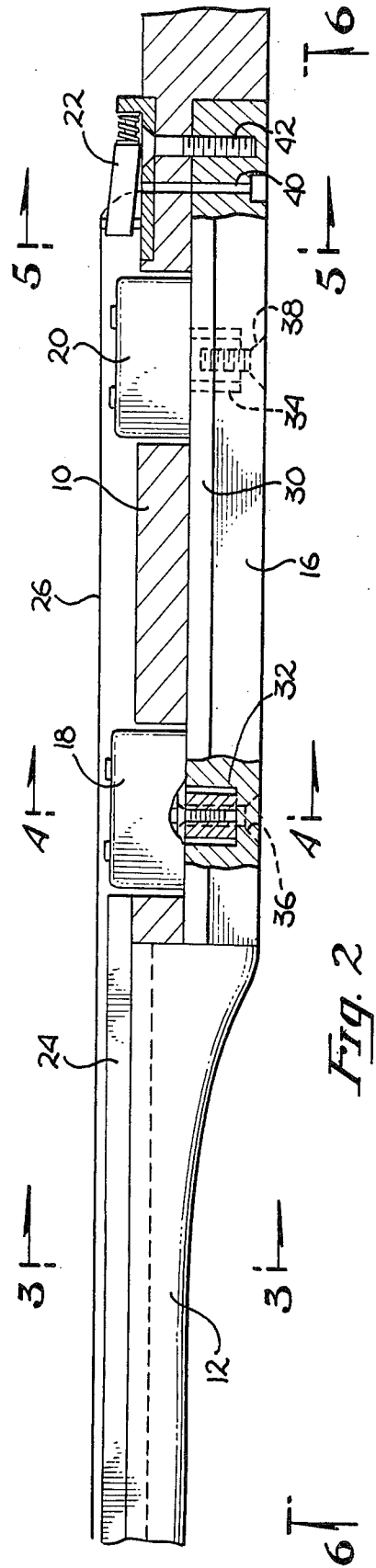
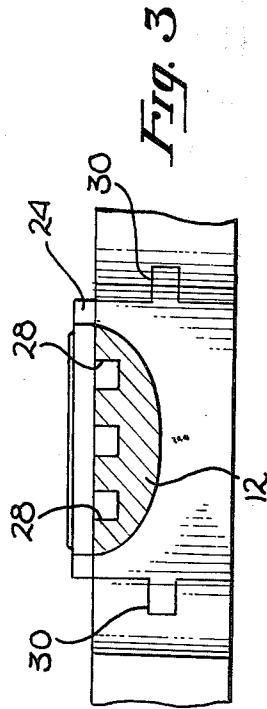
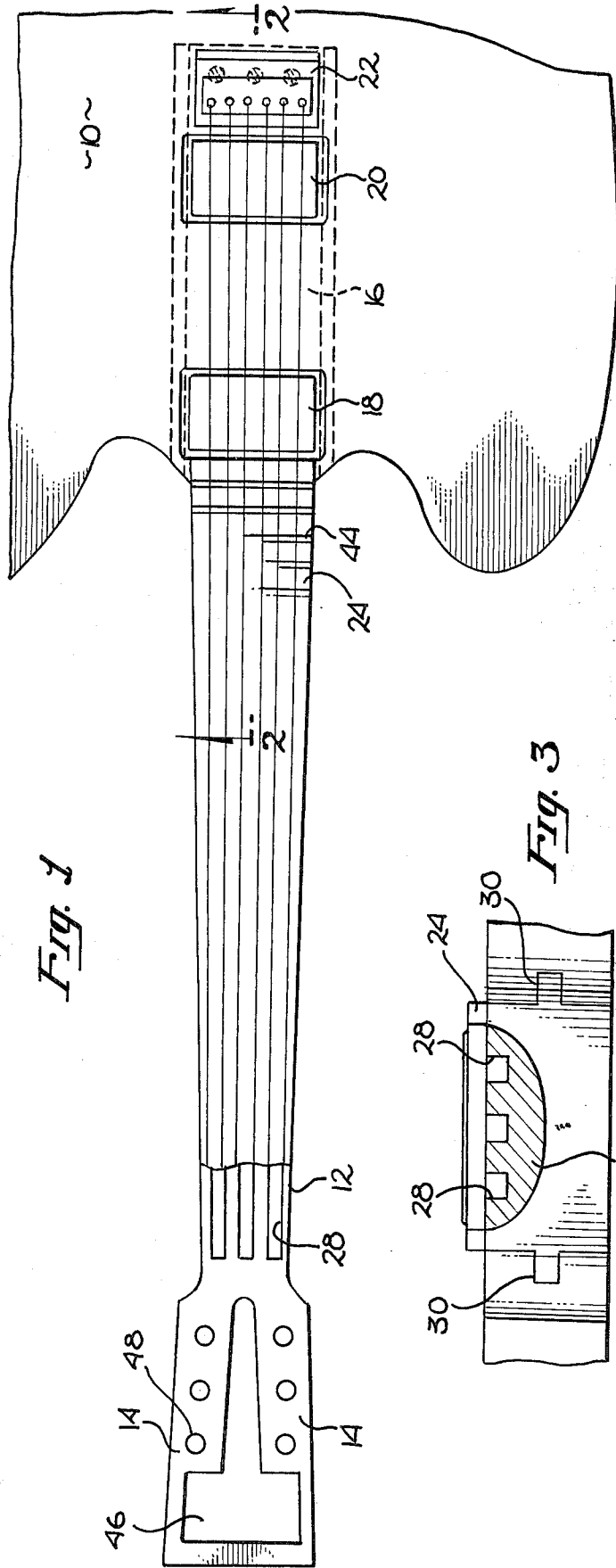
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[57] **ABSTRACT**

An electric stringed musical instrument including an integral member consisting of a head, a neck, a bridge and a soundboard (including a mounting surface for a pickup) attached to the instrument body made of hard wood. The unit is made from extruded aluminum which greatly facilitates maintenance of the instrument. Further, the pickups are solidly mounted on the soundboard, whereby the pickups tend to exclusively capture the sounds made by the strings to transmit proper signals to the amplifiers, resulting in stable and versatile tones.

**4 Claims, 7 Drawing Figures**





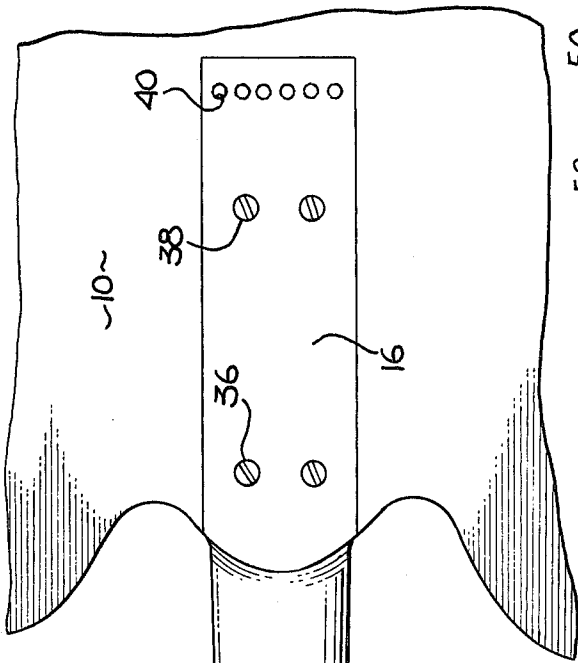


Fig. 6

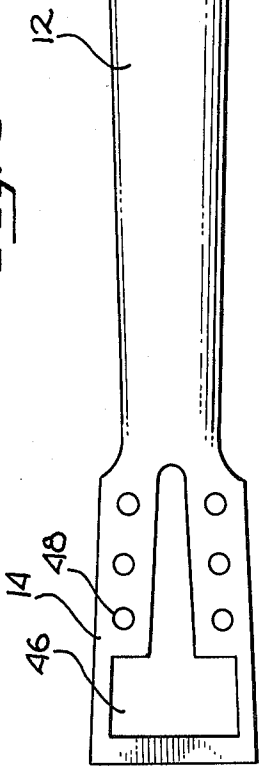


Fig. 4

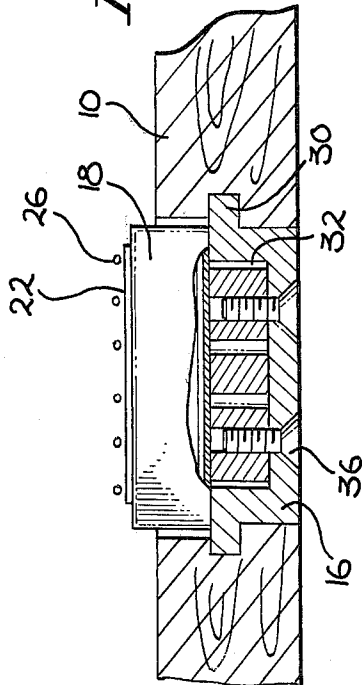


Fig. 5

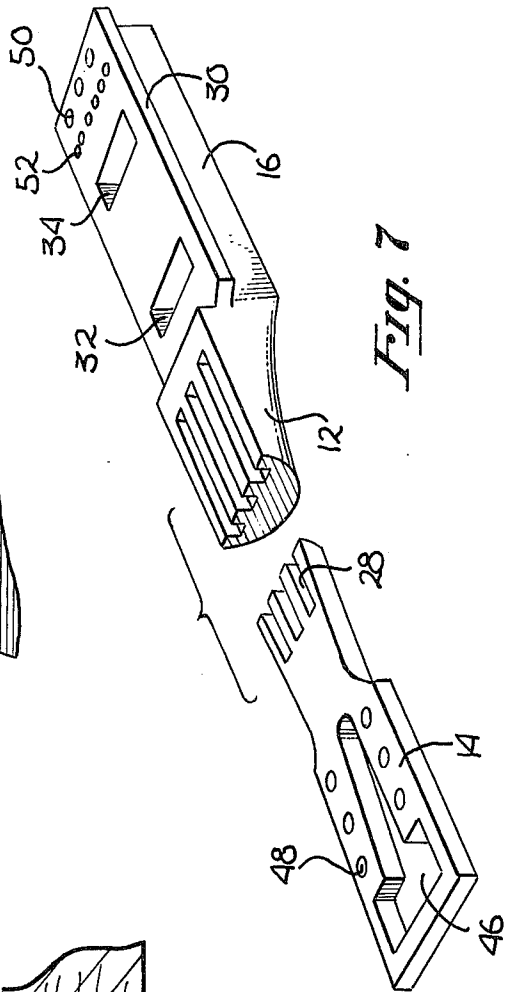


Fig. 7

## STRINGED MUSICAL INSTRUMENT WITH ALUMINUM MADE INTEGRAL UNIT

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention.

This invention relates to an electric stringed instrument, such as guitar, base guitar, etc.

#### 2. Prior Art

The instruments with a wooden neck taught by the prior art suffer from a warp or bend at the neck portion, which affects the uniformity of the fret balance and tends to cause a buzzing sound. In fact, a wooden neck is easily broken by a sharp blow or fall. Such wooden structures are very susceptible to changes in temperature and humidity. Many modifications have been proposed to attempt to overcome the above drawbacks. For instance, one suggested structure of the prior art is a truss rod that is a steel shaft implanted lengthwise in the wooden neck on a curving axis.

Recent prior art has disclosed electric guitars that have a one-piece neck and head made of cast aluminum which is, of course, strong enough not to require implantation of a truss rod therein. It has no separate finger board upon the neck, and frets are installed directly into the aluminum neck. The aluminum is coated with clear plastic so as to prevent the cast aluminum and the oxide that forms thereon from smearing onto the hand to provide a smooth surface. The neck is attached to the guitar body on a milled plateau by means of four wood screws, the plateau being provided in the body and machine-screwed to secure the joints. A pickup is mounted with springs upon plastic frames in such a manner that the pickup is completely isolated from the rest of the guitar body. If the pickup had been mounted solidly, the resulting sound would be much too tinny to make for a versatile instrument since the neck is made of aluminum. While this guitar provides many advantages regarding the maintenance over the other prior art guitars, there remained some unsolved problems. First, regarding the maintenance of the neck, the plastic coating upon aluminum is not very durable and would wear easily, which may lead to blackening of the player's hand and frequent recoating. Secondly, it is noted that a considerable loss in sound efficiency is unavoidable at the pickup of this guitar which is suspended in a frame or pickup guard and isolated from the rest of the guitar. This is ever more evident when playing at higher volume levels with powerful amplifiers in a large hall or arena, or with less powerful amplifiers in a confined area. Furthermore, the sounds coming from the amplifier speakers, as well as from the strings, are heard by the pickup. Further, the conventionally mounted pickup experiences vibration or rattling itself as it hangs suspended. Both of these deficiencies result in distorted sound. Therefore, the sound resulting from the string is confused by sound from the speakers and by the vibration of the pickup, and a distorted signal is sent to the amplifiers. Thus, the prior art electric guitars have some unsettled shortcomings in connection both with maintenance and sound.

#### BRIEF SUMMARY OF THE INVENTION

The electric stringed musical instrument of this invention employs greatly improved parts to overcome the shortcomings that the prior art instruments have failed to resolve. The primary feature of this invention exists in the material, construction and configuration of

the unit from the head to the soundboard of the instrument. Another feature of this invention is associated with the arrangement and mounting of the pickup on the unit.

Accordingly, it is an object of this invention to provide an electric stringed instrument having a construction made of extruded aluminum which allows excellent maintenance.

It is another object of this invention to provide an electric stringed instrument in which the neck is provided with at least one groove running the length thereof, which improves the efficiency of the transfer of the sounds generated by the strings down the neck to the soundboard.

It is still another object of this invention to provide an electric stringed instrument in which the pickup is mounted directly and solidly on the soundboard, which greatly increases fidelity and clarity of notes.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a partial plan view of an embodiment of a guitar of this invention.

FIG. 2 shows a partial sectional view of the embodiment.

FIG. 3 shows a sectional view along line 3 — 3 of FIG. 2.

FIG. 4 shows a sectional view along line 5 — 5 of FIG. 2.

FIG. 5 shows a sectional view along line 6 — 6 of FIG. 2.

FIG. 6 shows a partial bottom view of the embodiment.

FIG. 7 shows a perspective view of the integrated metal unit of the embodiment.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, in which the entire construction can be seen, the guitar comprises guitar body 10 made of hard wood such as maple and an integral unit consisting of neck 12 provided with three grooves 28, head 14 and soundboard 16. Finger board 24 with frets 44 is fixed upon neck 12 and pickups 18 and 20 are mounted on soundboard 16. The finger board 24 may be of wood construction secured by fastening means such as screws or adhesive to neck 12. Bridge 22 mounted on body 10 and strings 26 are supported by bridge 22.

More details can be seen from FIGS. 2 through 5. The integral unit is firmly bonded to guitar body 10 with any adhesive agent, such as A.I.R. epoxy resin. Edges 30 of sound board 16 are fixed in corresponding and mating recesses provided in guitar body 10 so that the two pieces virtually form one piece to assure the better sustenance of the sound and stable sound quality (see FIG. 3). Pickups 18 and 20 are mounted within guitar body 10 and fastened and secured to depressions 32 and 34 of sound board 16 respectively with screws 36 and 38 (see FIGS. 2 and 4). Bridge 22 is mounted on guitar body 10 and is fastened thereto with screws 42 which also engage the sound board 16 of the integral unit, and strings 26 are supported by bridge 22 (see FIG. 5).

FIG. 6 shows a bottom view of the neck unit bonded to guitar body 10. Screws 36 and 38 fasten sound board 16 to pickups 18 and 20 (see FIG. 2).

An understanding of the integral unit of this invention can best be gained by reference to FIG. 7. The unit substantially consists of neck 12, head 14 and sound board 16 as a single unit which may be made of a solid billet extrusion of preferably 6061 T-4 aluminum, which greatly facilitates the maintenance of the guitar and prevents warping or bending without any reinforcement. In this regard extruded aluminum has the added benefit that it does not blacken the user's hand, while other forms of aluminum have such a shortcoming unless specially treated, which special treatment may not be enduring or may be costly. Neck 12 has horizontal grooves 28 along the upper side thereof, which grooves efficiently transfer the sounds generated by the strings to sound board 16 and also reduce the total weight of the instrument. Typically three grooves may be employed having a cubical or rectangular cross section with each groove 28 measuring 1/4 by 1/4 inch and spaced at 1/8 inch interval. The number, shape and size of the grooves depend upon note preferences.

Head 14 includes a T-shaped opening 46 and holes 24 for tuning gears. The opening 46 is not indispensable but preferable to make the guitar lighter.

Sound board 16 comprises edges 30 extending from the upper side and fixed into the corresponding recesses in guitar board 10, depressions 32 and 34 for mounting pickups 18 and 20, holes 50 for screws 42 to fasten bridge 22 and holes 52 for strings 26. Pickups 18 and 20 which are mounted directly and solidly on sound board 16 assure better tone quality since they are free from unexpected noise caused by the vibration of the pickups and minimize undesirable sounds from the amplifiers.

In playing the instrument of this invention the sounds originating by the vibrations of the strings transfer down to the pickups through the grooves, being mellowed by the mating of wood and metal without any sacrifice to the fidelity of string movement. The pickups which receive the sounds almost exclusively trans-

duce accurate, clear signals to the amplifier. Thus, the instrument is capable of realizing the maximum versatility, i.e., from the most mellow "jazz" type sound clear to the most harsh rock music. Further, this versatility is maintained in tact notwithstanding the normal rough handling that such instruments experience as a result of usage and shipment and notwithstanding the various changes in humidity and temperatures to which it is exposed.

I claim:

1. A stringed instrument comprising:
  - a hardwood body;
  - an integral unit made of extruded aluminum including a head, a neck and a sound board, formed in sequence along its length, said neck having a finger board and frets fixed thereto;
  - strings connected between said head and said sound board;
  - said wood body secured to said sound board;
  - said integral unit having at least two groove extending from the vicinity of the head to the vicinity of the sound board beneath the finger board to transfer the sounds generated by said strings to said sound board;
  - at least one pickup means for transducing the sound vibrations to an electrical signal directly and solidly mounted on said sound board; and
  - a bridge member mounted on said wood body over said sound board to receive said strings.
2. The stringed instrument according to claim 1, wherein the integral unit has three grooves in parallel.
3. The stringed instrument according to claim 1, wherein the head has an opening.
4. The stringed instrument according to claim 1, wherein the sound board has edges extending from the sides thereof which fit into corresponding recesses provided in the wood body.

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