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NECK STRETCHING DEVICE IN STRINGED INSTRUMENTS

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FIG.1

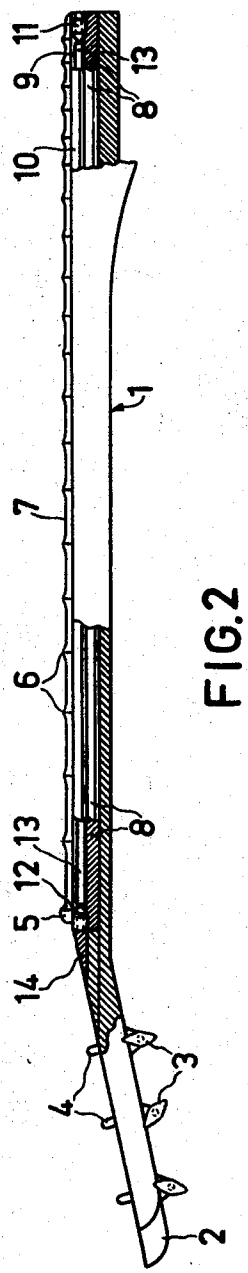
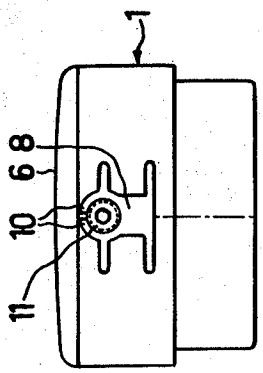


FIG.2



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NECK STRETCHING DEVICE IN STRINGED INSTRUMENTS

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12 Claims. (Cl. 84—293)

This invention relates to a neck stretching device in stringed instruments, preferably guitars.

The neck of stringed instruments is subjected to a constantly acting bending stress as a result of the strings which are stretched on the upper surface of the neck. In instruments of the same class where the fingerboard constituting the neck is rather long and the strings are of less extensible character, said bending stress is often so considerable that various measures have been found necessary to prevent warping or other deformation of the fingerboard.

A known measure is to provide a longitudinal tension rod in the lower portion of the fingerboard, in order to set said lower portion under a pressure acting in the longitudinal direction, said pressure tending to bend the fingerboard in a direction opposite to the bending moment of the strings and thus to balance the action of the strings. However, as a result thereof the fingerboard will be subjected to very great compressive forces in its longitudinal direction said forces being the sum of the compression force developed by the strings and the compression force developed by the rod in the lower portion of the fingerboard. Furthermore, the compensation obtained is not uniform along the length of the fingerboard due to the fact that the fingerboard becomes thinner towards one end and the tension rod therefore forms a certain angle with the center axis of the fingerboard. These two factors cooperate in again introducing the risk of deformation of the fingerboard.

According to the invention there is provided a stretching device which avoids the problems indicated above and which is substantially characterized in that underneath the upper surface of the neck there is provided a longitudinal channel extending parallel with said upper surface adjacent the same, and accommodating a rigid rod adapted to press with its ends with such force against shoulders blocking the ends of the channel that the upper surface of the neck is subjected to an extension force essentially neutralizing the compressive force of the strings.

Consequently the neck will practically be completely relieved of stress and the risk of deformation is reduced to a minimum.

An embodiment of the invention will be described below, reference being had to the accompanying drawing in which: FIG. 1 is a side view of a guitar fingerboard provided with a stretching device according to the invention, certain portions being broken away, and

FIGURE 2 is, on a larger scale, an end view of the fingerboard, viewed from the right side of FIG. 1 which is the end at which the fingerboard is secured to the guitar body.

The neck or fingerboard 1 shown in FIG. 1 is fixed at one end to the guitar body in known suitable manner. The fingerboard 1 is as usual provided with a head 2 carrying the pegs 3 acting upon the pins 4 passing through the head for stretching the strings (not shown), over the nut 5 and the frets 6. An element 7 is provided in the upper surface of the fingerboard 1 and provides a smooth surface between frets in a manner known per se to facilitate sliding of the fingers on the fingerboard.

Underneath the upper surface of the fingerboard there is secured in the neck 1, a bar 8 having substantially an I-profile (see FIG. 2), said bar running parallel with and adjacent said upper surface along the whole length of the fingerboard. In cases where the fingerboard is made of wood, the I-bar can most easily be embedded in the fingerboard by building up the same, just as in casting moulds, from at least two profiled parts corresponding to the shape of the I-bar (indicated by a dot and dash line in FIG. 2) said parts being glued to each other and to the I-bar thereby adherently securing the latter in the neck 1 to form an integral assembly. The upper portion of the bar 8 defines a through channel or bore 9. In the embodiment shown this channel is formed by bending inwards two flanges 10 originally directed upwards from the upper surface of the bar. This simplifies the manufacture because bars provided with channels can be produced consecutively as sections of a single continuously fed bar section where said flanges are bent consecutively by means of suitable folding means.

In the example shown, the channel 9 is internally threaded at both ends for receiving set screws 11 and 12 between which a rigid rod 13 is placed. The unit thus obtained is, at least at its end portions, fixed in place in the upper portion of the fingerboard 1. By tightening either set screw 11 or 12 the rod 13 in the channel 9 is subjected to compression stress which tends to stretch the upper portion of the bar 8 and thus the upper surface of the fingerboard. This stretching or tension force is then adjusted to a value which substantially corresponds to the compression force which the strings of the instruments normally exert on the upper surface of the fingerboard when the strings are correctly tuned. Due to the fact that the rod 13 is located as near the upper surface of the fingerboard as possible and thus also near and parallel to the operative plane of the string forces, the compression strain resulting from the force of the strings in the longitudinal direction of the fingerboard will be eliminated as far as possible, and therefore stresses are essentially completely relieved from the fingerboard in accordance with the object of the invention.

In order to enable subsequent adjustment of the bias which is usually made in the factory, an aperture which is adapted to be covered by a cover 14 may be provided in the head 2, through which aperture the set screw 12 is accessible and can be adjusted by means of a suitable tool. Such subsequent adjustment is normally not necessary, but in certain cases it may be desired if, for example, strings deviating from the standard quality are used.

Various modifications of the embodiment will be apparent to those skilled in the art, in particular, the invention is applicable to stringed instruments other than guitars, such as lutes, mandolins, violins, and so forth. Fundamentally, a bar is not required, in which case the channel 9 is provided directly in the fingerboard proper, and suitable supports for the set screws are provided in the fingerboard. Likewise a fixed blocking of one channel end may replace one of the set screws. The fact that two set screws have been used in the case described is due to the preferred, above-described manufacturing method for the bar 8. The set screw or screws could also be replaced by other forms of stretching means, such as by a stretching arm of the eccentric type or the like. The channel 9 which is formed by folding of the flanges 10 may be obtained in other manner, such as by the provision of a regular bore. Preferably, light metal is used for the bar 8, while steel is employed for the rod 13.

What I claim is:

1. A device for neutralizing compressive stresses induced in the neck of a string instrument by the tension

in the strings, said device comprising means embedded in said neck to form an integral structural assembly therewith, said means defining a bore extending lengthwise through the neck and proximate the surface of the neck above which the strings pass, means in said bore blocked against axial movement and means supported in the means embedded in the neck for acting on the means in the bore to exert tensile stresses in the means embedded in the neck and thereby tensile stresses in said neck itself for compensating the compressive stresses caused by the strings.

2. In a neck of a string instrument having a neck body adapted for supporting strings which by tension therein induce compression in the neck body, said body having an upper surface above which the strings are located, an improvement comprising a member secured in said body proximate the upper surface thereof to constitute an integral structural assembly therewith and means in and supported only by said member for exerting an adjustable tensile force in said member and a corresponding adjustable tensile force on the neck which is in opposition to the compression induced in the neck body by said strings.

3. A neck assembly for a string instrument comprising a neck body adapted for supporting strings which by tension therein induce compression in the neck body, said body having an upper surface above which the strings are located, a member embedded in said neck body proximate the upper surface thereof to form an integral structural assembly with said neck body, said member defining a longitudinal bore extending lengthwise through the neck body approximately parallel to the upper surface of the neck body, said member having at least one threaded end, a rigid rod in said bore, and means threadably supported in the threaded end of the member and in engagement with the rod for exerting tensile stress in the member as the means is threadably advanced in the rigid member against the rod, said member as a result of being embedded in the neck body then exerting tensile stress in the neck body which tends to cancel the compression induced in the neck body by the strings.

4. A neck assembly as claimed in claim 3 wherein said means threadably supported in the member is a screw.

5. A neck assembly as claimed in claim 4 wherein said member has an end opposite the aforesaid threaded end which is also threaded, the neck assembly further comprising a second screw supported in the other threaded end also for contacting the rod.

6. A neck assembly as claimed in claim 5 comprising means on said neck body for providing access to at least one of the screws for subsequent adjustment of the magnitude of tensile stress developed in the neck body.

7. A neck assembly as claimed in claim 3 wherein said member has an I-shaped cross-section and includes deformed projecting flanges which define said bore.

8. A neck assembly for a string instrument comprising a neck body adapted for supporting strings which by tension therein induce compression in the neck body, said body having an upper surface above which the strings are located, a member secured in said body proximate the upper surface thereof to constitute an integral structural assembly therewith, said member defining a longitudinal bore extending lengthwise through the neck proximate the upper surface of the neck, a smooth rigid stationary rod supported in said bore, and means threadably engaged with said member and in contact with the rod for exerting tensile force in the member as the means is threadably advanced in the member and is blocked by the rod.

9. For the neck body of a string instrument: a neck reinforcing and stretching device comprising a bar of relatively rigid material adapted for being embedded in the neck body with an upper surface of the bar extending adjacent and substantially parallel with the upper surface of the neck body, said bar having a longitudinal bore that extends adjacent and substantially parallel with the upper surface of the bar, means supported in said bar closing the ends of the bore and a smooth rod in said bore of a greater rigidity than that of the bar, said rod having ends adjacent the means closing the ends of the bore, at least one of the means closing the ends of the bar being adjustable in the longitudinal direction of the bore to subject the rod to a compression force between the closing means, said force stretching the upper surface of the bar to bend said bar and thus the neck body in a direction opposite to the bending resulting from the compression forces developed by the strings.

10. A device as claimed in claim 9 wherein said means closing the ends of the bore includes a set screw threadably engaged in the bar at each of the ends of the bore.

11. A device as claimed in claim 9 wherein the bar comprises a profiled body with two upper flanges extending originally in parallel planes along said bar, said flanges having longitudinally extending edge portions which are bent towards each other to define said bore.

12. A neck assembly for a string instrument comprising a neck body adapted for supporting strings which induce compression in the neck body as a consequence of tension in the strings, said neck body having an upper surface above which the strings are located, a relatively rigid bar having opposite ends, said bar being embedded in said neck body and adherently secured therein to form an integral structural assembly with the body, said bar including curved flanges which define a longitudinal bore extending proximate the upper surface of the body, a smooth rigid stationary rod supported in said bore in the bar, said flanges being internally threaded at at least one of the ends of the bar, and a threaded member threadably engaged in the flanges at said one end of the bar for contacting the rod in the bore and blocking axial movement of the rod in the bore such that as the threaded member is threadably advanced in the bar, the latter will have tensile stresses developed therein which in turn cause tensile stresses to be developed in the neck body tending to cancel the compression in the neck body caused by the strings.

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