Dec. 24, 1968 K. S. CLARK 3,417,647

MECHANICAL TUNING PEG FOR STRINGED INSTRUMENTS

Filed Dec. 8, 1967

FIG. 1.

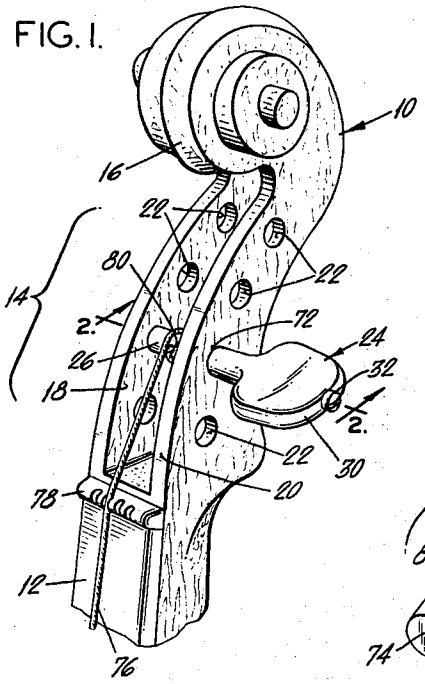


FIG. 3.

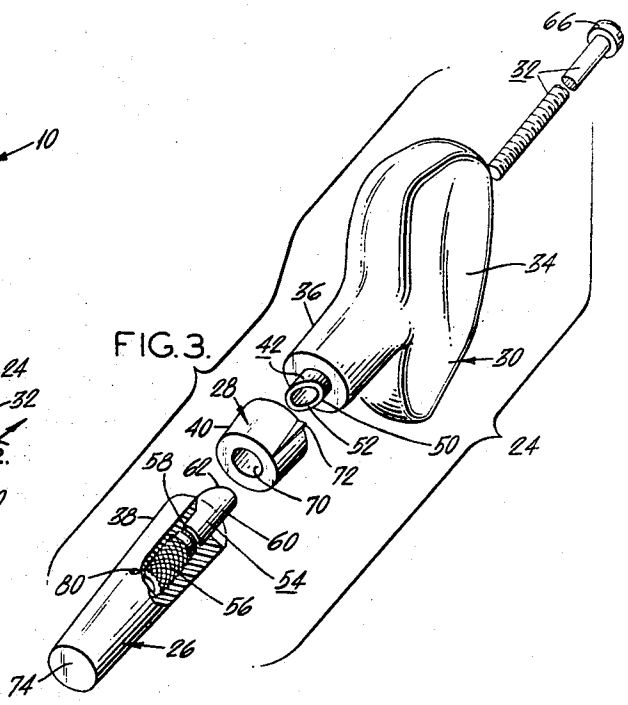


FIG. 2.

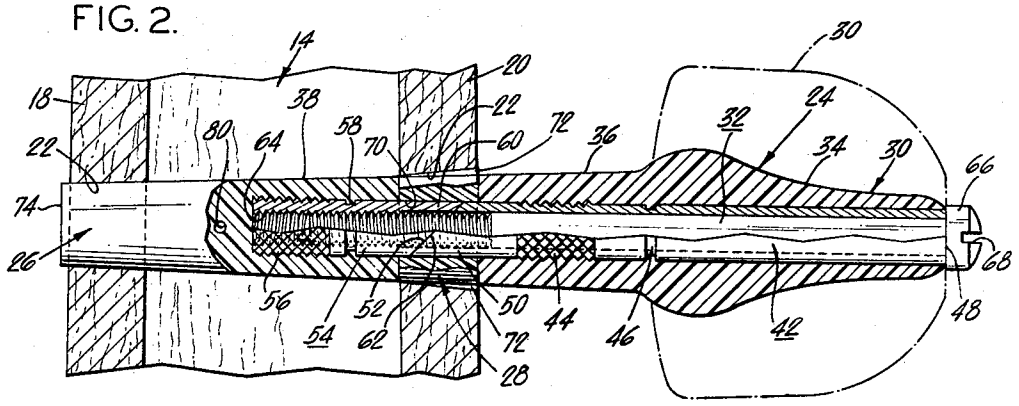
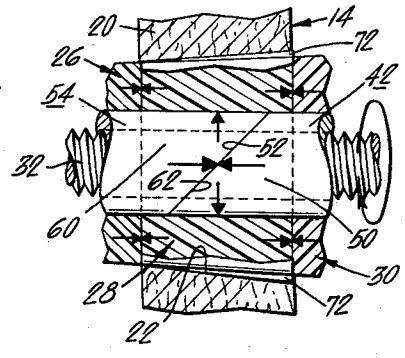


FIG. 4.



INVENTOR:
KENNETH S. CLARK
BY Howson & Howson
ATTYS.

United States Patent Office 3,417,647
Patented Dec. 24, 1968

3,417,647

MECHANICAL TUNING PEG FOR STRINGED INSTRUMENTS

Kenneth S. Clark, 300 Croyden Road, Cheltenham, Pa. 19012

Filed Dec. 8, 1967, Ser. No. 689,060
6 Claims. (Cl. 84—305)

ABSTRACT OF THE DISCLOSURE

A tuning peg for stringed instruments which may be locked in the desired position to a bushing inserted in the peg box of the instrument. The locking mechanism includes an internal axial screw which draws axially opposed sections of the peg against the side faces of the bushing, and at the same time by means of beveled inserts in the peg sections, provides a radial expansion force against the bore of the bushing to provide a double acting locking effect.

The present invention relates generally to tuning pegs for stringed instruments such as violins, violas, and cellos and relates more particularly to a tuning peg for such instruments which has an internal locking device, such pegs being known as "mechanical" pegs.

The tuning of stringed instruments is generally accomplished by adjusting the tension of the individual strings. In instruments such as violins, violas and cellos, the string tension is adjusted by means of tuning pegs which extend through aligned holes in the spaced walls of a peg box in the head of the instrument. In the traditional peg design, the peg shafts are tapered approximately two degrees to permit the frictional securing of the pegs in the similarly tapered peg holes when the string has been tuned to the desired tension. However due to the tension of the strings and the vibrations of the instrument, the pegs gradually slip from their adjusted position, necessitating a frequent retuning of the instrument.

To alleviate the tuning burden of conventional pegs, various mechanical pegs have been developed which have an internal mechanism for locking the peg in the peg box. Although several types of mechanical pegs have been developed, they have for the most part been characterized by complicated devices which require special tools and usually the services of a skilled craftsman to mount in an instrument. Prior mechanical pegs have generally been expensive to manufacture due to their complexity. In addition, there has been a danger with some pegs of cracking the peg box of the instrument by overtightening the pegs. Furthermore, some types of mechanical pegs cannot be manufactured with the traditional peg appearance.

In the present invention, a mechanical peg is provided of a simple, economical design having a minimum number of parts. The peg is adapted to lock both radially and axially against a bushing which may be inserted into the peg box of a conventional instrument without special tools. In brief, the present peg comprises a peg head and a string holder which are secured in axially opposed relation against the sides of the bushing by an axial screw. The screw passes through a tubular metal insert anchored axially within the peg head, and is threaded into a similar insert axially anchored in the string holder, each of the inserts extending in close fitting relation into an axial bore of the bushing. The ends of the inserts within the bushing engage along complementary beveled surfaces whereby rotation of the peg head causes rotation of the string holder. Upon tightening of the locking screw, the bushing is gripped axially by the peg head and string holder, and in addition the beveled surfaces of the inserts

provide an internal expansion of the inserts against the bore of the bushing to provide a radical locking force.

It is accordingly a first object of the present invention to provide a mechanical tuning peg for stringed instruments of a simple, economical design which provides a positive locking effect without endangering the integrity of the instrument.

A further object of the invention is to provide a tuning peg as described which may be easily mounted in a conventional instrument without special tools.

Another object of the invention is to provide a tuning peg as described which has the traditional appearance of a tapered friction peg.

A still further object of the invention is to provide a tuning peg as described which may be fabricated largely of molded plastic materials.

Still another object of the invention is to provide a tuning peg as described which, with a single screw adjustment, provides both an axial and a radial gripping force on a bushing inserted into the instrument peg box.

Additional objects and advantages of the invention will be more readily apparent from the following detailed description of an embodiment thereof when taken together with the accompanying drawings in which:

FIG. 1 is a perspective view of the head of a stringed instrument showing a mechanical tuning peg in accordance with the present invention mounted therein;

FIG. 2 is a partial enlarged sectional view taken along line 2—2 of FIG. 1 showing the details of the tuning peg;

FIG. 3 is an exploded perspective view showing the several components of the tuning peg of FIGS. 1 and 2; and

FIG. 4 is an enlarged partial sectional view schematically showing the locking forces developed against the tuning peg bushing upon the tightening of the peg locking screw.

Referring to the drawings, and particularly FIG. 1 thereof, the head **10** of a stringed instrument such as a violin, viola or cello is illustrated including the string fingering board **12**, peg box **14** and scroll **16**. The peg box **14** includes spaced walls **18** and **20** having aligned pairs of peg holes **22** arranged in spaced relation therein. In the conventional instrument shown, the peg holes **22** are tapered to receive the traditional tapered pegs which have a two degree taper to provide a frictional seating of the pegs. Since the pegs are normally arranged in a staggered manner with two peg heads extending on each side of the instrument, the peg holes are tapered accordingly.

The instrument head **10** is conventional in every respect and requires no modification to accept the present mechanical tuning pegs. The present peg, generally designated **24**, as shown in FIG. 3 comprises prior to installation four separable components, the string holder **26**, bushing **28**, peg head **30** and the peg locking screw **32**. The peg head **30** includes a thumb piece **34** and a shank portion **36** having a slightly tapering cylindrical surface. As shown in FIG. 2, in their assembled relation, the outer surfaces **38** and **40** respectively of the string holder **26** and bushing **28** form a continuation of the tapering outer surface of the shank **36** of the peg head. The taper should be approximately two degrees to permit the peg to fit without special adaptation into the peg holes **22** of a conventional instrument.

The peg head **30** is preferably formed of a plastic material such as high impact styrene and has molded therewithin a metal tubular insert **42** extending axially therethrough. The insert **42** is knurled at **44** and includes an annular groove **46** to prevent rotational and axial movement of the insert with respect to the peg head. The

insert **42** terminates at its outer end **48** in flush relation with the end of the thumb piece **34** and at its inner end extends beyond the shank portion **36** in a projecting portion **50**, terminating in a beveled surface **52**.

The string holder **26** similarly is made in the preferred embodiment of a molded plastic such as styrene and includes a metal insert **54** axially molded partway thereinto. A knurled surface **56** and an annular groove **58** on the insert **54** prevent rotational or axial movement of the insert within the string holder. The insert **54** extends axially beyond the string holder **26** in a projecting portion **60** which terminates in a beveled surface **62** complementary to the surface **52** of the peg head insert **42**. The insert **54** has a threaded coaxial bore **64** which is adapted to receive the threaded locking screw **32**. The locking screw passes with a slight clearance through the tubular insert **42** of the peg head **30**. The screw head **66** of the locking screw in the assembled peg seats against the outer end **48** of the insert **42** and includes a slot **68** for adjustment by means of a screw driver or thin coin.

The bushing **28** includes an annular bore **70** which should be of a diameter only slightly greater than the outer diameter of the projecting portions **50** and **60** of the inserts **42** and **54** to permit a snug fit of the inserts therewithin. The bushing includes a pair of wedge-like securing fins **72** for anchoring the bushing against rotation within the peg box wall. In order to conceal the bushing from view, it should have an axial dimension equal to the thickness of the peg box wall. The bushing is preferably made of the same plastic material as the peg head and the string holder, and a preferred material for this purpose as indicated above is high impact styrene.

For installation of the present mechanical peg in a conventional instrument of the type illustrated in FIG. 1, the string holder insert projecting portion **60** is inserted into the bore **70** of bushing **28** and the two components are inserted into one of the pairs of aligned peg holes of the instrument, the smaller end **74** of the string holder fitting into the smaller of the tapered peg holes. The bushing is press fitted into the larger of the aligned holes, the securing fins **72** locking the bushing in place against rotational forces. The fins **72** should be quite small to avoid damage or defacing of the instrument upon insertion of the bushing. The fins should actually be somewhat smaller than illustrated in the drawings, their size in the drawings being exaggerated for purposes of illustration.

The peg head **30** is positioned with the projecting portion **50** of the insert **42** extending into the bore **70** of the bushing **28** so that the complementary beveled surfaces **52** and **62** of the inserts **42** and **54** are in contact as illustrated in FIG. 2. The locking screw **32** is then screwed into the threaded bore **64** of insert **54** and the installation is complete. In the instrument **10** illustrated in FIG. 1, only one of the pegs **24** has been installed for simplicity of illustration although it is apparent that the three additional pegs would be installed in the same manner.

For operation, a string **76** of the instrument is passed at the upper end of the fingering board **12** over the string guide **78** and through a string hole **80** in the string holder **26**. A knot is placed in the string to secure it in the string hole. With the locking screw **32** loosened slightly from its tightened position, the string is tuned by turning the thumb piece **34** to achieve the correct string tension. The beveled surfaces **52** and **62** of inserts **42** and **54** are held in contact by the screw **32** and provide a rotation of the string holder **26** with the peg head **30**.

To lock the peg in the desired position, the locking screw **32** is tightened, causing the double acting locking effect illustrated schematically in FIG. 4. The end faces of the string holder and the shank portion of the peg head should engage the bushing simultaneously with the engagement of the complementary beveled surfaces of the inserts as the tightening of the locking screw is begun. In view of the relatively non-compressible character of the inserts as contrasted with the plastic material of the

string holder, bushing, and peg head, a further tightening of the screw results in a radial displacement of the inserts to produce a radial locking force at the same time that the axial locking force is applied to the bushing. Since the projecting portions of the inserts fit snugly within the bore of the bushing initially, only a slight radial displacement of the projecting insert portions, in the order of a few thousandths of an inch, is required to exert a substantial locking force radially against the bushing bore. The clearance between the locking screw **32** and the bore of tubular insert **42** need be only about six thousandths of an inch to permit this locking force, and, in view of its small size, cannot be seen in the drawings.

While the angle of the beveled surfaces **52** and **62** has been illustrated as 45° in the preferred embodiment, this angle may be varied depending on the relative degree of radial expansion force desired. Similarly, although metal such as steel is the preferred material for the inserts and locking screw, and molded plastic such as high impact styrene is preferred for the string holder, peg head and bushing, other materials may suitably be employed. For example, the string holder, bushing and peg head may be made of wood or a wide variety of synthetic materials including nylon. Although the cost would be high, it would be possible to form the string holder and insert as well as the peg head and its insert as unitary metal elements.

By use of the present invention, the tuning of the instrument strings is required only at infrequent intervals and in many instances can be accomplished by adjustment of a fine tuning device (not shown) at the lower end of the string. The present invention is particularly adapted for use with students who initially have difficulty in properly tuning the instrument. The device is also of importance to accomplished musicians such as orchestra personnel and soloists who no longer are forced to hastily retune an instrment in the midst of a performance.

Although the present invention is shown illustrated in the setting of a double walled peg box, the invention can also be adapted for use with instruments such as guitars and banjos wherein the peg passes through a single peg board. For such applications, the axial length of the string holder is substantialy shortened.

I claim:

1. A mechanical tuning peg for a stringed instrument comprising, a bushing adapted for fixed mounting in the instrument, a string holder and a peg head disposed on opposite sides of said bushing, a projecting portion of said string holder extending into the bore of said bushing and terminating therewithin in a beveled surface, a projecting portion of said peg head extending into the bore of said bushing and terminating in a beveled surface complemetary to and in engagement with the beveled surface of said string holder portion, and screw means connecting said peg head and said string holder, the tightening of said screw means providing an axial locking force on said bushing by said opposed string holder and peg head as well as a radial locking force provided by said bevel-surfaced projecting portions.

2. A mechanical tuning peg for a stringed instrument comprising a bushing adapted for fixed mounting in the instrument, a string holder and a peg head disposed on opposite sides of said bushing, an internally threaded insert anchored in said string holder, a projecting portion of said insert extending into the bore of said bushing and terminating therewithin in a beveled surface, a tubular insert anchored in said peg head, a projecting portion of said latter insert extending into the bore of said bushing and terminating in a beveled surface complementary to and in engagement with the beveled surface of said string holder insert, and a locking screw passing through said tubular peg head insert and threadedly engaged in said string holder insert, the tightening of said locking screw providing an axial locking force on said bushing by said opposed string holder and peg

head as well as a radial locking force provided by said bevel-surfaced inserts.

3. A mechanical tuning peg for a stringed instrument such as a violin, viola or cello having a peg box characterized by tapered peg holes, said peg comprising a tapered bushing adapted for press fitting into a peg hole of the instrument peg box, a string holder and a peg head disposed on opposite sides of said bushing, said string holder having a tapered configuration adapted to extend into the peg hole opposite that of said bushing, means on said string holder for attaching a string thereto, an internally threaded insert anchored in said string holder, a projecting portion of said iinsert extending into the bore of said bushing in close fitting relation and terminating therewithin in a beveled surface, said peg head comprising a thumb piece and a shank portion, a tubular insert anchored in said peg head and extending axially through said thumb piece and shank portion, the shank portion of said peg head having a tapered configuration which is an extension of the tapered configuration of said string holder and bushing, a projecting portion of said peg head insert extending into the bore of said bushing in close fitting relation and terminating in a beveled surface complementary to and in engagement with the

beveled surface of said string holder insert, and a locking screw passing through said tubular peg head insert and threadedly engaged in said string holder insert, the tightening of said locking screw providing an axial locking force on said bushing by said opposed string holder and peg head as well as a radial locking force provided by said bevel-surfaced inserts.

4. A turning peg is claimed in claim 3 wherein said inserts are made of metal and wherein said string holder, bushing and peg head are made of a molded plastic.

5. A tuning peg as claimed in claim 3 wherein said bushing includes an axially aligned wedge shaped locking fin on the tapered surface thereof for securing the bushing against rotation in the instrument peg hole.

6. A tuning peg as claimed in claim 3 wherein the taper of said peg head shank portion, bushing, and string holder is approximately two degrees.

References Cited

FOREIGN PATENTS

280,298 11/1914 Germany.

RICHARD B. WILKINSON, *Primary Examiner.*