March 15, 1966 D. JAQUITH 3,240,097

PEG DEVICE FOR STRINGED INSTRUMENTS

Filed Oct. 12, 1964

Fig. 1.

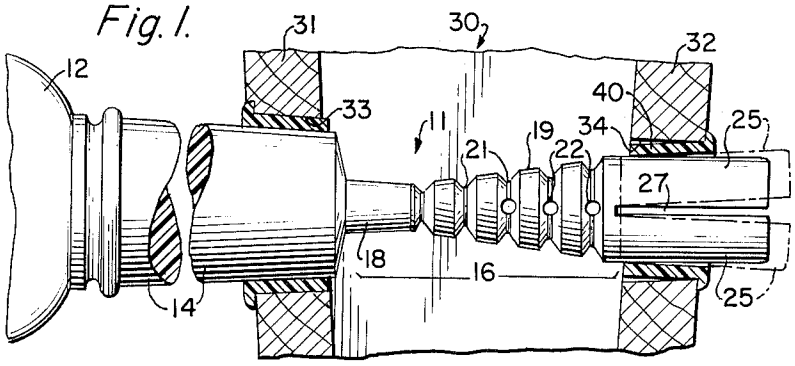


Fig. 2.

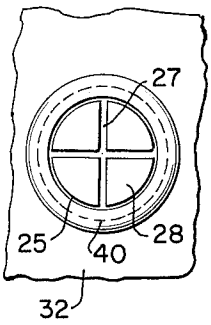


Fig. 3.

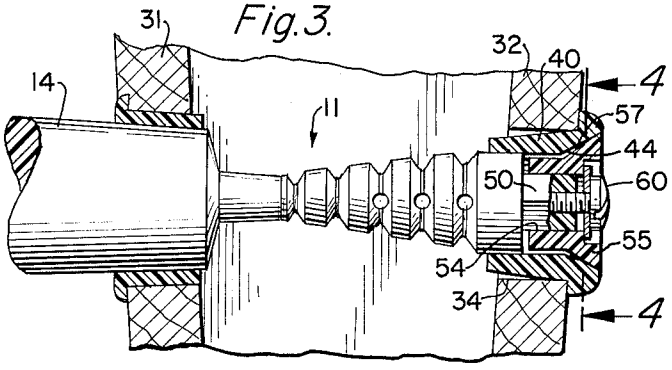


Fig. 4.

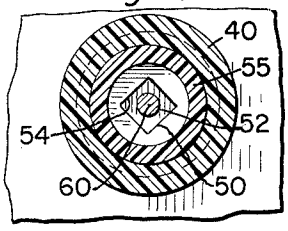


Fig. 5.

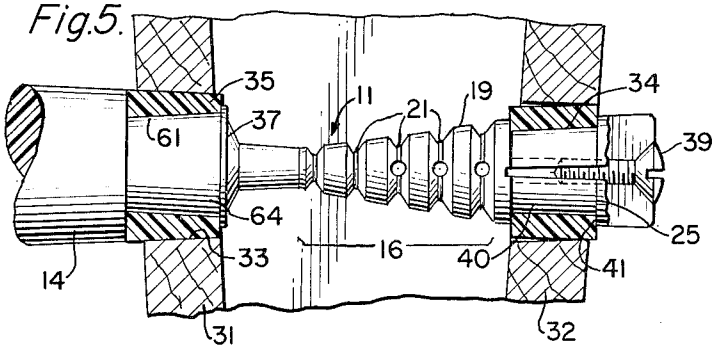
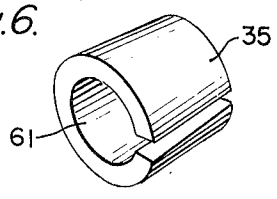


Fig. 6.



INVENTOR:
DOUGLAS JAQUITH,
BY Edward A. Sokolski
ATTORNEY.

United States Patent Office 3,240,097
Patented Mar. 15, 1966

3,240,097

PEG DEVICE FOR STRINGED INSTRUMENTS

Douglas Jaquith, 10302 Ilona Ave.,
Los Angeles 64, Calif.

Filed Oct. 12, 1964, Ser. No. 403,067
14 Claims. (Cl. 84—304)

This invention relates to a peg device for stringed instruments and more particularly to such a device for use in facilitating the tuning of such an instrument.

In stringed instruments, such as violins, violas, cellos and basses, the strings are tuned by means of truncated cone shaped pegs which fit through similarly shaped apertures formed in a pegbox. The conventional type peg and pegbox arrangement has several deficiencies: First, it is impossible with this type of arrangement to hold the string at its originally tightened tuned position for any length of time due to the inadequacies of the holding action obtained between the mating peg and pegbox. Second, the pegs which are generally made of wood often make irregular frictional contact with the pegbox sides, resulting in chatter when tuning which makes it difficult to properly tune the instrument. Third, the sides of the wooden pegbox generally provide rather poor bearing surfaces for the pegs, especially in view of the instability of wood with changing climatic conditions. Fourth, it is often difficult to fit replacement pegs in the pegbox due to irregularities in the pegbox either due to wear, the effects of climate variations, or inaccuracies in fabrication. Fifth, with conventional pegs and pegboxes it is necessary to constantly apply inward pressure on the peg while tuning to prevent the peg from slipping in view of the use of the same direction of taper in both the peg and pegbox.

The device of this invention overcomes the shortcomings of prior art peg devices by providing idealy tapered bearing means for the peg which are mounted in the pegbox and by specially forming and shaping the peg and its bearings so that while it is capable of being easily turned to tighten the string on the bearings provided, the peg will not slip from its final resting position, thus maintaining the tuning of the string for relatively long periods of time. Further, the central portion of the peg is shaped to provide an ideal turning and holding surface for the string. Certain of the bearings provided for the peg have a split ring configuration and are made to provide a tight fit over a variation of pegbox aperture sizes. Both the peg and its associated bearings are fabricated of a smooth stable material to make for good bearing surfaces.

It is therefore an object of this invention to provide an improved peg device for use in stringed instruments.

It is a further object of this invention to provide a peg device for use with stringed instruments having better holding characteristics than prior art devices.

It is a further object of this invention to eliminate chatter in the tightening of strings in stringed instruments thereby facilitating fine tuning.

It is still another object of this invention to provide a peg device for use in stringed instruments having improved bearing means for supporting the pegs in the pegbox.

It is still another object of this invention to provide an improved peg device for use in stringed instruments which will maintain the tuned position of a string over long periods of time.

It is another object of this invention to facilitate the replacement of pegs in a stringed instrument.

Other objects of this invention will become apparent from the following description taken in connection with the accompanying drawings of which—

FIG. 1 is an elevation view, partially in cross section, of a first embodiment of the device of the invention,

FIG. 2 is an end view of the embodiment illustrated in FIG. 1,

FIG. 3 is an elevation view partially in cross section of a second embodiment of the device of the invention,

FIG. 4 is a cross sectional view taken along the plane indicated by 4—4 in FIG. 3,

FIG. 5 is an elevation view partially in cross section of a third embodiment of the device of the invention, and

FIG. 6 is a perspective view of the left hand sleeve bearing of the embodiment of FIG. 5.

Referring now to FIGS. 1 and 2, a first embodiment of the device of the invention is shown. Peg member **11** includes thumb piece portion **12** adjacent to which is portion **14** in the shape of a truncated cone having a slight taper running in the direction away from the thumb piece. Tapered portion **14** drops off abruptly to central portion **16**, which includes a first truncated conical section **18** having a relatively small diameter and having a taper running away from section **14**, and a second truncated cone shaped section **19** having a taper running towards section **18**. Section **19** has a plurality of circular grooves **21** formed therein for accommodating a string and string holes **22** for attaching such string to the peg. The peg further has an end portion **25** which has crosswise running slots **27** formed therein to form four resilient fingers **28**. End portion **25** is formed so that fingers **28** are expanded outwardly when no pressure is applied thereto, so that such fingers resiliently urge outwardly.

Pegbox **30** includes oppositely facing walls **31** and **32**, each of which has an aperture **33** and **34** respectively, formed therein. Apertures **33** and **34** are of a truncated conical configuration with their tapers running from left to right. Fitted in aperture **33** is truncated conical sleeve **35** which is split so that it can readily be inserted into aperture **33** and will expand to form a press tight fit therewith. Such split configuration also enables a given size sleeve to be utilized in apertures having some variation in diameter. Sleeve **35** has a taper generally corresponding to that of aperture **33**. Press fitted into aperture **34** is truncated conical sleeve **40**. Sleeve **40** has an inside and outside taper running opposite to that of aperture **34**. Peg **11** and sleeves **35** and **40** are preferably made of a temperature stable resilient and smooth material, such as a suitable plastic. An acetyl resin having graphite lubricant added thereto has been found to be most satisfactory. Sleeves **35** and **40** should be fabricated of a somewhat dissimilar material from that used for peg **11** to make for more efficient bearing surfaces.

The device of the invention operates as follows: A string which has been threaded through one of holes **22** is tightened in the normal fashion by rotating thumb piece **12**. The string will ride in grooves **21**, these grooves providing a more positive grip on the string and preventing such string from gravitating towards the center of the peg. The greater diameter at the right hand side of section **19** enables greater string takeup in the early tightening when such takeup is required. The final tightening of the string is accomplished with such string being wound around section **18**, the inward taper of the section causing the string to coil right and preventing it from contacting the pegbox which might cause string wear or malfunctioning thereof. The smaller diametered left hand section **18** provides greater leverage and finer control in the final stages of tuning where such is required.

As thumb piece **12** is rotated, end piece **25** is gradually moved to the right and in the final stages of tuning comes to rest as indicated by the dotted lines. In this final position as shown by the dotted lines, the fingers **28** of portion **25** will expand outwardly, this by virtue of the outward taper of sleeve **40**. Such outward expansion of fingers **28** provides a firm retention of peg **11** in sleeve **40**, preventing slippage thereof. The relatively low friction sur-

faces of the peg and its associated sleeve bearings make for easy rotation of the peg to provide proper tightening. At the same time, when such tightening has been achieved, the outwardly urging fingers **28** provide a tight holding engagement of peg **11** with sleeve **40**.

Referring now to FIGS. 3 and 4, a second embodiment of the device of the invention is shown. This embodiment is similar to that of FIGS. 1 and 2, except for the holding mechanism utilized in conjunction with the right hand wall of the pegbox. Like portions of this embodiment will be identified by the same numerals used in FIGS. 1 and 2. Sleeve **40** is press fitted into aperture **34**. The inner wall of sleeve **40**, rather than having a taper running through its entire extent, only has its end portion **44** tapered inwardly. The end portion **50** of peg **11** is rectangular in configuration and has a threaded aperture **52** formed therein. Locking piece **55** has a central rectangular aperture **54** which mates with peg end portion **50**. Locking piece **55** has an inwardly tapering outer wall portion **57** with a greater taper than wall portion **44** of sleeve **40**. In an operative embodiment of the device of the invention a taper of two degrees for wall portion **44** and four degrees for wall portion **57** has been found to operate satisfactorily. In the embodiment of FIGS. 3 and 4, holding action is achieved by tightening screw **60**, this being done when the peg is initially installed and adjusted as necessary to maintain proper holding action. The tightening of screw **60** forces holding piece **55** into close engagement with sleeve **40**. Peg **11** is prevented from rotating relative to holding piece **55** by virtue of the engagement provided between rectangular aperture **54** and rectangular end portion **50**.

Referring now to FIGS. 5 and 6, a third embodiment of the device of the invention is illustrated. This embodiment differs from the others in that holding engagement is primarily achieved by virtue of the action of left hand sleeve bearing **35**, right hand sleeve bearing **38** being used for fine adjustment of the holding action. Sleeve bearing **35** as a longitudinal slot splitting it, similar to the left hand sleeve bearing shown in FIG. 1. However, the inner wall **61** of sleeve bearing **35** has a taper which runs towards the thumb piece which is opposite to the taper of the corresponding sleeve bearing of FIG. 1. Also adjacent to truncated conical portion **14** of peg **11** is a stepped down truncated conical portion **64** which has a taper running in the same direction as sleeve bearing **35**. Sleeve **35** is retained on peg **11** by means of retainer ring **37** formed in the end of peg portion **64** so that the peg and sleeve **35** can be installed in the pegbox as a single unit. Right hand sleeve **40** is retained in recess **41** formed in end portion **25**. Final holding adjustment is achieved by tightening screw **39** to expand the fingers of end portion **25** against sleeve bearing **40**. Effective holding action is achieved by virtue of the pressure of sleeve **35** against the wall of peg portion **64**, this being implemented by the clamping action of the walls of aperture **33** on the sleeve.

As already indicated, for proper operation of the device of the invention it is important that peg **11** and bearings **35** and **40** be made of a flexible resilient type material such as a plastic, which is relatively stable under temperature variations. This will enable accommodation to variations in pegbox apertures.

The device of this invention is especially suited to replacement of damaged or broken pegs. In this type of situation the slotted sleeve bearings will adapt readily to small variations in aperture size, as will the resilient end portions **25** of the peg.

The device of this invention thus provides simple yet highly effective means for facilitating the tuning of stringed instruments. Low friction bearing means are provided which make it easy to turn the peg and eliminate the chattering so common with conventional peg mechanisms. In addition, means are provided for providing tight holding action for the peg once it has been set into position, such holding action being effective to obviate the necessity for frequent retuning of the instrument.

While the device of the invention has been described and illustrated in detail, it is to be clearly understood that this is intended by way of illustration and example only and is not to be taken by way of limitation, the spirit and scope of this invention being limited only by the terms of the following claims.

I claim:

1. A peg device for a stringed instrument comprising a pegbox having a pair of opposite walls, said walls having opposite truncated conically shaped apertures formed therein, the tapers of said apertures running in the same direction,

sleeve bearing means pressfitted into each of said apertures, the inner walls of said bearings means both having the shape of a truncated cone, the tapers of such truncated cones running towards the center of the peg box, and

peg means for holding and tightening a string of said instrument, said peg means including a thumb piece at one end thereof, an inwardly tapering truncated conical portion immediately adjacent to said thumb piece, a central portion, and an end portion adjacent to said central portion, said end portion including expansion means for holding said peg means to an associated one of said sleeve bearing means,

said trancated conical portion of said peg means being rotatably supported by the other of said sleeve bearing means.

2. The device as recited in claim **1** wherein said peg means includes means formed therein for retaining said sleeve bearing means.

3. A peg device for a stringed instrument comprising a pegbox having a pair of opposite walls, said walls having opposite truncated conically shaped apertures formed therein, the tapers of said apertures running in the same direction,

sleeve bearing means pressfitted into each of said apertures, the inner walls of said bearing means both having the shape of a truncated cone, the tapers of such truncated cones running towards the center of the pegbox, and

peg means for holding and tightening a string of said instrument, said peg means including a thumb piece at one end thereof, an inwardly tapering truncated conical portion immediately adjacent to said thumb piece, a central portion having first and second truncated conical parts, said parts tapering inwardly towards each other, said second part being substantially longer than said first part and having a substantially greater cone base diameter than said first part, and an end portion adjacent to the second part of said central portion, said end portion including expansion means for holding said peg means to an associated one of said sleeve bearing means,

said truncated conical portion of said peg means being rotatably supported by the other of said sleeve bearing means.

4. The device as recited in claim **3** wherein said other of said sleeve bearing means is split longitudinally to permit compression thereof to reduce its effective diameter.

5. The device as recited in claim **3** wherein the expansion means of said end portion comprises longitudinal slots formed in said end portion to form outwardly expanding fingers.

6. The device as recited in claim **3** wherein the expansion means of said end portion comprises a holding piece, said holding piece being externally concentric with said end portion and internally concentric with said one sleeve bearing means, said holding piece being adapted to form a non-rotatable joint with said end portion and a holding joint with said one sleevebearing means.

7. The device as recited in claim 3 wherein said second part of said central portion has a plurality of spaced ring-like grooves formed therein.

8. In a stringed instrument having a pegbox with apertures formed in the opposite walls thereof, a string tuning device comprising

a sleeve member fabricated of smooth flexible stable material press fitted into at least one of said apertures, said sleeve member having a truncated cone-shaped outer wall and being split longitudinally, and

a peg member fabricated of smooth flexible temperature stable material having a thumb piece, a truncated conical portion adjacent to said thumb piece tapering away from said thumb piece, a central portion having a first truncated conical section adjacent to said truncated conical portion with a diameter substantially less than that of said truncated conical portion, said first section tapering away from said truncated conical portion, and a second truncated conical section extending from said first section with a taper running opposite to that of said first section, the diameter of the end of said second section from which the taper thereof runs being substantially greater than the corresponding end of said first section, and an end portion, said end portion including means for providing outward expansion thereof, said peg member being supported in said pegbox apertures on said sleeve member,

whereby said sleeve member provides a rotation bearing for said peg member and said peg member end portion provides means for holding said peg member to said pegbox.

9. The device as recited in claim 8 wherein the second conical section of said central portion has a plurality of spaced ring-like grooves formed therein, said grooves being concentric with the longitudinal axis of said peg.

10. The device as recited in claim 8 and further including a second sleeve member fitted into the other of said apertures, the tapers of both of said sleeve members running towards the center of said pegbox.

11. The device as recited in claim 8 wherein said end portion has a longitudinally extending slot means formed therein to form a plurality of expansion fingers.

12. In a stringed instrument having a pegbox with apertures formed in the opposite walls thereof, a string tuning device comprising

sleeve means fabricated of smooth flexible stable material press fitted into at least one of said apertures, said sleeve means having a truncated cone-shaped outer wall and being split longitudinally, and

a peg member fabricated of smooth flexible temperature stable material having a thumb piece, a truncated conical portion adjacent to said thumb piece tapering away from said thumb piece, a stepped down truncated conical portion adjacent to said aforementioned conical portion tapering towards said thumb piece, a central portion having a first truncated conical section adjacent to said stepped down portion with a diameter substantially less than said stepped down portion, said first section tapering away from said stepped down portion, and a second truncated conical section extending from said first section with a taper running opposite to that of said first section, the diameter of the end of said second section from which the taper thereof runs being substantially greater than the corresponding end of said first section, and an end portion, said end portion including means for providing outward expansion thereof, said peg member being supported in said pegbox apertures on said sleeve means,

whereby said sleeve means provides a rotation bearing for said peg member and said peg member end portion provides means for holding said peg member to said pegbox.

13. The tuning device as recited in claim 12 wherein said sleeve means comprises a sleeve fitted into each of said apertures.

14. The tuning device as recited in claim 13 wherein said stepped down portion has a retainer ring formed therein for retaining one of said sleeves in said peg member.

References Cited by the Examiner

UNITED STATES PATENTS

423,648	3/1890	Wilcox	84—305
1,328,824	1/1920	Dorrell	84—305
1,375,304	4/1921	Lindsey	84—305
1,832,379	11/1931	Gilbert	84—304
2,173,800	9/1939	Coates	84—305

LEO SMILOW, *Primary Examiner.*