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RACKET STRINGING APPARATUS

Filed Oct. 14, 1938

2 Sheets-Sheet 1

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2 Sheets-Sheet 2

Fig. 2.

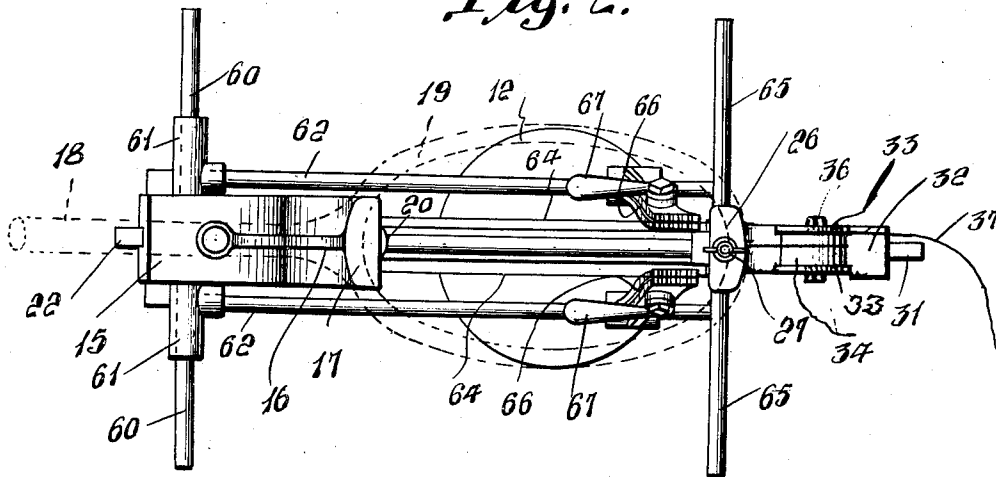


Fig. 3.

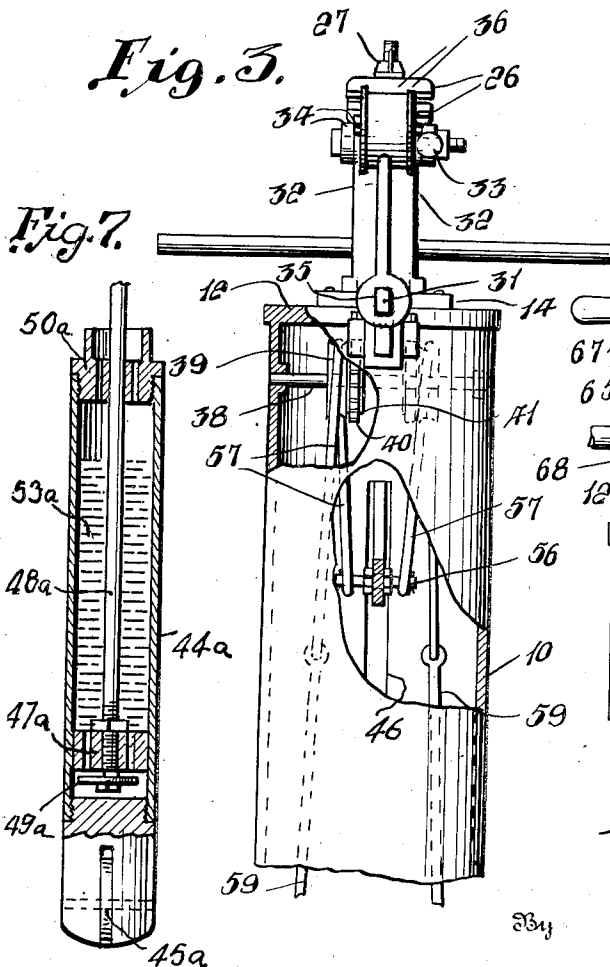
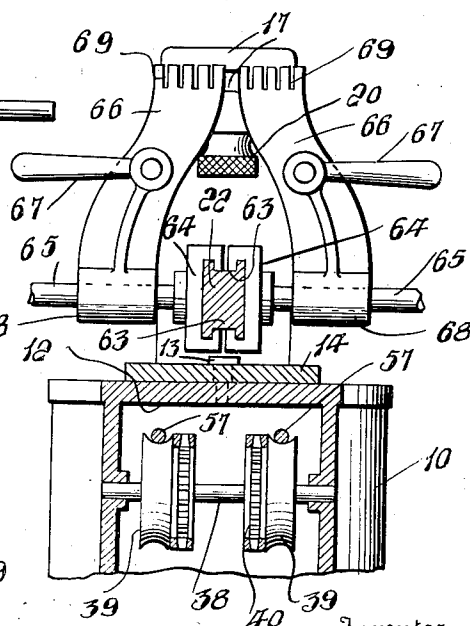


Fig. 4.



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UNITED STATES PATENT OFFICE

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RACKET STRINGING APPARATUS

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6 Claims. (Cl. 273—73)

This invention relates to certain new and useful improvements in racket stringing apparatus.

The primary object of the invention is to provide racket stringing apparatus wherein the string frame of the racket is supported during the stringing operation with the handle of the racket free of support with liability of damaging or marring the handle of the racket eliminated.

A further object of the invention is to provide racket striking apparatus wherein a movably mounted weight is associated with the string tensioning device and is adjustable to vary the tension imparted to the strings with clamps engageable with the strings for holding sections of the strings under tension during the stringing of the racket.

With the above and other objects in view that will become apparent as the nature of the invention is better understood, the same consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings:

Figure 1 is a side elevational view, partly broken away and shown in section of racket stringing apparatus constructed in accordance with the present invention and illustrating the adjustable weighted member associated with the string gripping and tensioning device;

Figure 2 is a top plan view;

Figure 3 is a fragmentary end elevational view, partly broken away and shown in section and showing the string gripper of the tensioning device;

Figure 4 is a detail sectional view taken on line 4—4 of Figure 1 with the string clamps removed from the longitudinal supporting bars and mounted upon the laterally extending supporting bars and illustrating the slidable mounting of the later supporting bars;

Figure 5 is a horizontal sectional view taken on line 5—5 of Figure 1;

Figure 6 is a fragmentary side elevational view of part of the mechanism of the string tensioning devices, and

Figure 7 is a vertical longitudinal sectional view of the dash-pot device associated with the weighted lever of the string tensioner.

Referring more in detail to the accompanying drawings, the reference character 10 designates a tubular column or post supported at its lower end by a base plate 11 and carrying a head at the upper end thereof for the support of a racket to be strung while devices for effecting the string-

ing of the racket and the tensioning of the strings are associated with the post and head.

The upper end wall 12 of the tubular post 10 has pivotally attached thereto by means of the pivot pin 13, one end of an elongated plate 14 that is movable in a horizontal plane, the other end of the plate 14 that extends laterally of the tubular post 10 having a block 15 rigid with the upper face thereof and from which block an arm 16 extends in an upwardly inclined direction as shown in Figure 1 in overlying relation to the plate 14, the upper free end of the arm being constructed and arranged for the support of a portion of the racket frame. As shown in Figure 1, a pair of gripping jaws 17 is carried by the upper free end of the arm 16 for engagement with the throat portion of a racket, the handle of the racket being designated by the reference character 18 and the string frame thereof being shown at 19, the jaws 17 being moved into gripping engagement with the throat of the racket by means of the thumb screw 20.

A rectangular opening extends longitudinally of the block 15 for the reception of one end of an elongated bar 22 of the same configuration in cross-section as the opening 21, the bar being slidably mounted in said opening and retained in adjusted position by means of the set screw 23. A racket frame supporting arm 24 similar in design to the arm 16 carried by the block 21 is mounted as at 25 upon the adjacent end of the bar 22, the upper free end of the arm 24 having racket frame gripping jaws 26 moved into clamping engagement with a racket frame by means of the thumb nut 27 as shown in Figure 1.

As shown more clearly in Figures 1 and 3, diametrically opposite housings 28 are carried by the upper end of the tubular post 10 adjacent the upper end wall 12 while a rod rectangular in cross-section and shown by the reference character 29 extends through said housings 28 and the upper end of the post 10, anti-friction bearings 30 being provided in the housings 28 to facilitate sliding movements of the rod 29 and for the reduction of friction. The end of the rod 29 adjacent the racket supporting arm 24 is laterally offset as shown at 31 for the rigid support of an upstanding string puller arm 32 that carries upon its upper end a vertically adjustable drum having side flanges 33 with a rubber band 34 surrounding the drum and engaged at its side edges with said flanges 33. The drum is mounted upon the upper end of the arm 32 and the string 37 to be placed under tension is wrapped around the rubber band 34 on the drum with the end of the

string positioned between a side edge of the rubber band and an adjacent side flange 33 on the drum as shown in Figure 2.

To place the racket string 37 under tension during the stringing of the racket frame 19, the rod 29 carrying the string puller arm 32 is shifted transversely of the upper end of the tubular post 10 in a direction away from the racket supporting arm 16, the devices for effecting movement of the rod 29 including a shaft 38 shown in Figure 4 as being journaled at its ends in the side walls of the tubular post 10 adjacent its upper end for the rotatable support of a pair of spaced combination sheaves and sprocket wheels, each of which includes a sheave wheel section 39 and a sprocket wheel section 40. A sprocket chain 41 is arranged at each side of the rod 29 within the tubular post 10, one end of each sprocket chain being anchored as at 42 to a side of the rod 29, the sprocket chain 41 passing over the adjacent sprocket wheel 40, a distance less than the entire circumference thereof with the other end of the sprocket chain anchored as at 43 to the sprocket wheel section 40. An arm 44 is pivoted at one end as at 45 to the inner wall of the tubular post 10 below the shaft 38 and extends through a longitudinally extending slot 46 in the side wall of the tubular post 10 diametrically opposite the pivot 45, the extended end of the arm 44 being graduated as at 47 and carrying at its outer free end weights 48 that are adjustable on the arm by the anchor screws 48^a to vary the force of leverage thereof.

A rectangular treadle frame including side rods 49 and end rods 50 and 51 incloses the lower end of the tubular post 10, the treadle rod 51 being pivotally supported in upstanding lugs 52 carried by the base plate 11 while a cross rod 53 extending between and rigid with the side rods 49 of the treadle frame works in arcuate slots 54 in side walls of the tubular post 10, the rod 50 of the treadle frame constituting the operating end thereof. As shown more clearly in Figures 1, 3 and 5, the weighted arm 44 in the end thereof within the tubular post 10 is provided with a longitudinally extending slot 55 through which a pin 56 extends, each projecting end of the pin 56 having one end of a cable 57 attached thereto, the cable 57 extending over an adjacent sheave wheel 39 and directed downwardly for attachment at its lower end as at 58 to the upper end of a link 59 rising from the cross-rod 53 of the treadle frame. To tension a string 37, the treadle frame rod 50 is lowered by foot pressure thereon, such movement exerting a pull on the cables 57 attached to the arms 59 for raising the weighted end of the arm 44, such movement placing slack in the chain 41 so that the rod 29 carrying the string clamp puller arm 32 may be shifted to the desired position for engagement with the string 37. When pressure of the treadle rod 50 is relieved, the arm 44 is lowered by the weights 48 for reversely rotating the combination sheave and sprocket wheels to cause the chains 41 to wind onto the sprocket wheels 40 and to exert a pull on the rod 29 with the string clamp arms 32 placing the string 37 under the desired tension. To cushion the descending movement of the weighted end of the lever arm 44 to relieve sudden strains on the racket string 37, there is provided a dash-pot construction shown in Figures 1 and 7 as comprising a fluid cylinder 44^a pivotally mounted at its lower end as at 45^a on a bracket 46^a projecting laterally of the tubular post 10 below the lever arm 44, the fluid cylinder 44^a ex-

tending upwardly and substantially parallel with the tubular post 10 beneath the lever arm 44 exteriorly of said tubular post. A ported piston 47^a is reciprocally mounted in the fluid cylinder 44^a and is carried by the lower end of a piston rod 48^a extending through the piston 47^a and carrying a movable disk valve 49^a upon its lower end cooperating with the ported piston. A vented plug 50^a is mounted in the upper end of the fluid cylinder 44^a and through which the piston rod 48^a slidably extends, the upper end of the piston rod 48^a carrying a clevis 51^a that is pivotally attached as at 52^a to the lever arm 44 inwardly of the graduations 47 on said lever arm. Fluid of a suitable character and indicated by the reference character 53^a in the cylinder 44^a retards reciprocatory movements of the ported piston 47^a and operates to effect a smooth and even pivotal movement of the lever arm 44 in the absence of all jerky or vibratory movements of said arm and for an even pull on the racket string 37. The weights 48 are adjustable on the arm 44 to the desired position indicated by the arm graduations 47 for placing the string 37 under the desired tension.

String clamps are provided for holding a string under tension while the plate 14 is being shifted on its pivotal mounting 13 for placing the racket frame 19 in a position relative to the string clamp puller arms 32 for the tensioning of the succeeding string section of the racket frame and as shown in Figures 1 and 2, a rod 60 projects laterally of each side of the block 15 to receive a sleeve 61 carried by one end of a rod 62 positioned parallel with the bar 22. As shown in Figure 4, the upper and lower edges of the bar 22 are provided with guide grooves 63 to receive edge flanges of a pair of sliding blocks 64 with a block disposed at each side of the bar 22, the assembly of the blocks 64 on the bar 22 permitting unobstructed passing movements relative to each other. An outwardly directed rod 65 is carried by each sliding block 64. The string clamp comprises a pair of arms 66 moved into clamping position relative to each other by means of the cam and handle device 67, the lower ends of the arms 66 being provided with clamp elements 68 for engagement with the rods 62 and 65 while the upper ends 69 of the arms 66 are fashioned for engagement with a racket string and to provide clearance for cross strings. As shown in Figure 1, the sliding blocks 64 are retained in adjusted positions on the bar 22 by means of the set screw 70.

From the above detailed description of the invention, it is believed that the construction and operation thereof will at once be apparent and while there is herein shown and described the preferred embodiment of the invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

I claim:

1. In a racket stringing apparatus, wherein a racket supporting head is mounted upon the upper end of a standard, and wherein the string is tensioned by sections with a tensioned string section held under tension while tensioning another section, string tensioning means including a string puller slidably mounted on the upper end of the standard for movements transversely thereof, a drum having a cushion surface carried by the puller adapted to have the racket string wound thereon, an adjustably weighted lever arm pivotally mounted on the standard, op-

erative connections between the string puller and lever arm for operating the string puller to place a string under tension, a dash pot connection between the lever arm and standard for retarding

5 movements of the lever arm during pulling force thereof on the string puller and manually operable means in said operative connections for rendering the lever arm and string puller inoperative.

10 2. In a racket stringing apparatus, wherein a racket supporting head is mounted upon the upper end of a standard, and wherein the string is tensioned by sections with a tensioned string section held under tension while tensioning another section, string tensioning means including

15 a string puller slidably mounted on the upper end of the standard for movements transversely thereof, a drum having a cushion surface carried by the puller adapted to have the racket

20 string wound thereon, an adjustably weighted lever arm pivotally mounted in the standard, operative connections between the string puller and lever arm for operating the string puller to place a string under tension, a dash pot connection

25 between the lever arm and standard for retarding movements of the lever arm during pulling force thereof on the string puller and manually operable means in said operative connections for rendering the lever arm and string

30 puller inoperative, the string puller including a rod slidable in the standard, the operative connections including a flexible element attached at one end to the slide rod, a rotatable member on the standard to which the other end of the

35 flexible element is attached and a flexible connection between the lever arm and rotatable member.

3. In a racket stringing apparatus, wherein a racket supporting head is mounted upon the upper

40 end of a standard, and wherein the string is tensioned by sections with a tensioned string section held under tension while tensioning another section, string tensioning means including a string puller slidably mounted on the upper end

45 of the standard for movements transversely thereof, a drum having a cushion surface carried by the puller adapted to have the racket string wound thereon, an adjustably weighted lever arm pivotally mounted in the standard,

50 operative connections between the string puller and lever arm for operating the string puller to place a string under tension, a dash pot connection between the lever arm and standard for retarding movements of the lever arm during

55 pulling force thereof on the string puller and manually operable means in said operative connections for rendering the lever arm and string puller inoperative, the string puller including a rod slidable in the standard, the operative connections including a flexible element attached at

60 one end to the slide rod, a rotatable member on the standard to which the other end of the flexible element is attached and a flexible connection between the lever arm and rotatable member,

65 and the manually operable means including a lever frame attached to one end of the flexible connection between the lever arm and rotatable member.

70 4. In a racket stringing apparatus, wherein a racket supporting head is mounted upon the upper end of a standard, and wherein the string is tensioned by sections with a tensioned string

section held under tension while tensioning another section, string tensioning means including a string puller slidably mounted on the upper end of the standard for movements transversely thereof, and a slide rod movable therewith, a wheel journaled in the upper end of the standard, a flexible element anchored at one end to the rod and anchored at its other end to the wheel to be partly wound thereon and means for rotating the wheel to wind the flexible element

5 thereon to move the rod and string puller for placing a string under tension, including an adjustably weighted lever arm operatively connected to said wheel, and a dash pot connection between the lever arm and standard for retarding

10 movements of the lever arm during pulling force thereof on the string puller.

5. In a racket stringing apparatus, wherein a racket supporting head is mounted upon the upper end of a standard, and wherein the string

20 is tensioned by sections with a tensioned string section held under tension while tensioning another section, string tensioning means including a string puller slidably mounted on the upper end of the standard for movements transversely

25 thereof, and a slide rod movable therewith, a wheel journaled in the upper end of the standard, a flexible element anchored at one end to the rod and anchored at its other end to the wheel to be partly wound thereon and means for rotating the wheel to wind the flexible element

30 thereon to move the rod and string puller for placing a string under tension including an adjustably weighted lever arm, a flexible member passing over said wheel with one end attached to the weighted lever arm, manually operable means to which the other end of said flexible member is attached for moving the string puller

35 in a string releasing direction of movement against action of the weighted lever arm, and means for retarding movements of the weighted lever arm during pulling force thereof on the string puller.

6. In a racket stringing apparatus, wherein a racket supporting head is mounted upon the

45 upper end of a standard, and wherein the string is tensioned by sections with a tensioned string section held under tension while tensioning another section, string tensioning means including a string puller slidably mounted on the upper end of the standard for movements transversely

50 thereof, and a slide rod movable therewith, a wheel journaled in the upper end of the standard, a flexible element anchored at one end to the rod and anchored at its other end to the wheel to be partly wound thereon and means for rotating the wheel to wind the flexible element

55 thereon to move the rod and string puller for placing a string under tension, including an adjustably weighted lever arm, a flexible member passing over said wheel with one end attached to the weighted lever arm, manually operable means including a foot operated lever frame pivotally mounted at the lower end of the standard to which the other end of the flexible

60 member is attached for moving the string puller in a string releasing direction of movement against the action of the weighted lever arm, and means for retarding movements of the weighted lever arm during pulling force thereof

65 on the string puller.

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