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(54) Racquet stringing tension measuring device.

(57) A device to measure the tension of the stringing of rackets used for playing tennis, squash, etc., which entails an end area (2) to strike the said stringing and another adjacent area which includes a multiple diapason or tuning device (5). On striking the stringing, and depending on the tension of the strings, one of the diapasons vibrates, thus providing a signal which can later be measured or digitalized to provide a measurement of the tension of the stringing.

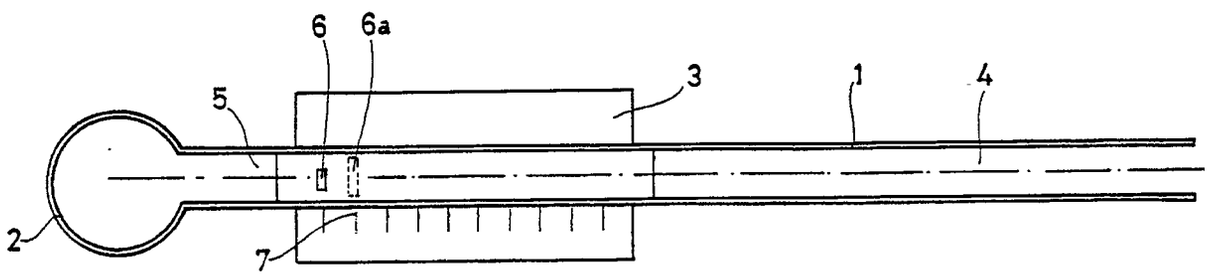

FIG: 2

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The invention deals with a device to measure the tension of the stringing of rackets, such as those used in tennis, squash, etc., so that a specific player can check whether the stringing tension of his racket or rackets is appropriate for the conditions in which he usually plays with them.

Every player who has a set of rackets knows the most suitable tension for each one of them, so that with this tension and with these rackets, his game develops to suit his needs. Knowing therefore the tension of one of his rackets, this player can in any way determine a measurement that corresponds with the said tension, and which is suitable for him.

For example, this measurement might be an acoustic impression, a physical impression, among others. By fixing this impression, whatever it might be, it would be possible to know immediately whether the stringing tension of the racket is suitable.

The invention claims a simple device which provides a perceivable and measurable measurement, which is related to the required tension of the stringing, so that a signal or measurement from the device corresponds to this tension.

Basically, a measuring device in accordance with the invention is made up of a long element with a rounded end, for example, and another that substancially corresponds with its own ends. Close to the rounded end, a multiple diapason or tuning device is placed, composed of a set of independent teeth, which are different and project out from the fixed base of the diapason. This diapason is firmly fixed by its base, from which the teeth rise freely. A simple blow of the rounded base of the measuring device on the racket stringing will immediately produce the vibration of one of the teeth of the multiple diapason, corresponding to the tension of the stringing.

The vibration of this tooth can be perceived visually, for instance, and can be made to correspond with a graduated scale with numbers, signals, etc, When a racket is in suitable condition for a player, this signal shows the measurement required of the stringing tension. When the racket has been used for a time and the player wishes to check whether the tension is suitable, he can strike the racket again with the measuring device and if the tooth that vibrated is the same one, the racket is in the required condition,

If the tooth that vibrated is a different one, for instance a shorter one, the stringing tension is higher than required, and if the tooth that vibrates is longer, the stringing tension will be lower, which indicated to the player that he has to loosen or tighten the tension of the racket stringing. The multiple diapason is trapezoidal in shape, for example, with the teeth decreasing in height, so that only one tooth vibrated due to the effect of the blow on the racket stringing, and at the same time it must be easy to notice the tooth that vibrates so that it can be compared with the signal or mark on the measuring device.

According to the invention, and in accordance with what has been stated so far, the multiple diapason is of a certain size and can be made of plastic, metal, etc. The measuring device has one surface, at least, attached to the position of the multiple diapason which is equipped with a series of marks or signals corresponding to each tooth with a specific marking, so that the tooth that vibrates can be identified by reading the corresponding marking.

The invention also covers the possibility that the vibration of a specific tooth of the diapason can be suitably digitalized with the appropriate conventional equipment which is already known, thus automatically providing the desired measurement.

The vibration of one of the diapason teeth might also generate a perceivable acoustic signal, for example, so that this signal call also be digitalized.

These and other details of the invention can be seen better on the sheet of drawings which is attached, which shows a solution covered by the invention.

Figure 1 shows a basic measuring device, in accordance with the invention.

Figure 2 shows a top view of the previous figure, with a multiple diapason housed inside the measuring device. Figures 3 and 4 show an elevation of the diapason and a left side view respectively.

In this particular case and in accordance with Figure 1, a measuring device in accordance with the invention, is made up of a long U-shaped body, with one longitudinal end 1 and another rounded end 2 used to perform the striking or percussion on the racket stringing. The body of the measuring device has some lateral projections 3.

In, accordance with Figure 2, the top view of the previous figure, the two wings of the measuring device take in a multiple diapason 5 just towards the zone where the lateral projections 3. The diapason is fixed to the arms of the measuring device in a stable way by any means, for example screws.

The projection 3 is fitted with a series of marks or signals 7, which correspond to each one of the teeth 6 of the diapason. On the rounded end 2 making contact with the racket stringing, the vibration of one of the diapason teeth 6a is caused, with this being appreciable, for example visibly, while the rest of the teeth 6 remain static.

The player notices this vibration of the tooth 6a and relates it with the corresponding mark 7a. If this mark 7a is the one which indicates the string-

ing tension required, it is clear that the stringing is adjusted to his needs. Otherwise, the stringing tension will need adjusting.

A multiple diapason or tuning device is shown in Figures 3 and 4 and is made up, in the form known, of a base 5 and a set of teeth 6 projecting to different heights or lengths, thus allowing a range of possibilities to be achieved.

Obviously, this is a simple solution for the invention and includes the spirit of what is claimed and the basic objectives pursued, although it must be well understood that this does not exclude any other variations or possibilities, among which is included the possibility of using different materials for the diapason and for the measuring device.

The solution shown is of very low cost and can be used immediately to control the stringing tension of a racket.

As was stated earlier, the application of this basic technique can be associated with a digitalized unit which might function operated by the physical vibration of the teeth or by the audible effect of this vibration, depending on the case.

Claims

1. RACKET STRINGING TENSION MEASURING DEVICE, which is essentially characterized because it is made up of an elongated element with a rounded end to strike the stringing and another end in the form of a handle, in that in the proximity of the said rounded end is fitted a multiple diapason equipped with several teeth, in that one of these teeth vibrates due to the effect of striking the rounded end of the measuring device depending on the stringing tension and in that this vibration can be checked to provide a measurement of the tension of the said stringing with means which are contained in the measuring device.

2. RACKET STRINGING TENSION MEASURING DEVICE, in accordance with Claim 1, characterized because in the diapason unit, when a tooth vibrates, it generates an alternative displacement of the tooth which can be perceived visually, making each tooth correspond to a graduated scale of the device to measure the tension depending on the tooth which is activated.

3. RACKET STRINGING TENSION MEASURING DEVICE, in accordance with Claim 2, characterized because the signal from the moving or vibrating tooth is transmitted to a digitalizing unit connected to the device so as to be measured.

4. RACKET STRINGING TENSION MEASURING DEVICE, in accordance with Claim 1, characterized because the diapason provides, with the movement of the tooth, a sound signal which can be digitalized by means of a unit fitted on the measuring device itself.

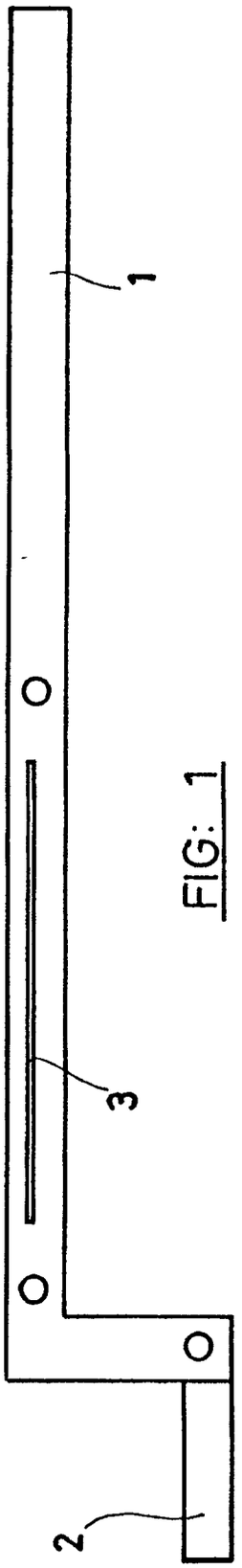

FIG: 1

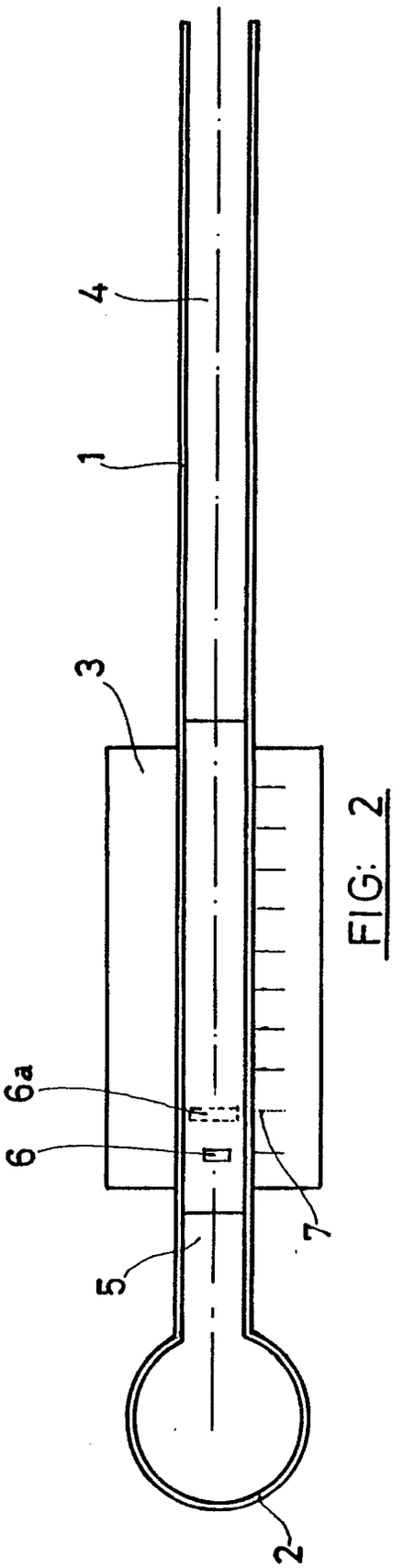

FIG: 2

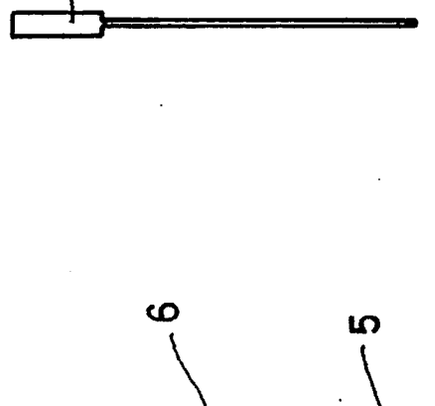

FIG: 4

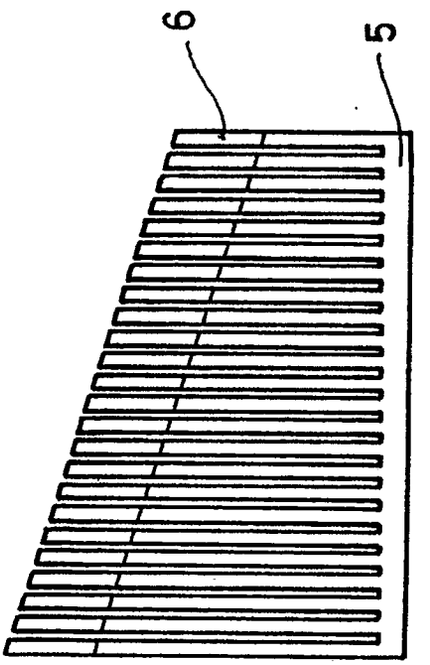

FIG: 3

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EUROPEAN SEARCH REPORT

Application Number

EP 90 50 0039

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	WO-A-8 903 709 (K. MATJASIC) * Page 4, lines 10-16,26-33 *	1	A 63 B 51/00 G 01 L 5/04

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A 63 B
G 01 L

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	21 November 90	GERARD B.E.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same catagory
A: technological background
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E: earlier patent document, but published on, or after the filing date
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