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(54) Racket frame with shock absorbing characteristics

(57) The looped portion (20) of a racket frame has first and second portions (21, 22) divided by the longitudinal axis (L) of the racket, which extends from the throat (30) to and an uppermost point (23) of the looped portion (20). The first portion (21) has a first point (E) of the smallest cross-section adjacent to the uppermost point (23); a second point (H) of the largest cross-section adjacent to the throat (30); a fifth point (F) between the first and second points (E, H) which has a first larger cross-section; and a sixth point (G) between the fifth and second points (F, H) which has a second smaller cross-section. The second portion (22) has a seventh point (Q) between the third and fourth points (P, Y) with a third smaller cross-section equal to the second smaller cross-section of the sixth point (G) and an eighth point (X) between the seventh and fourth points (Q, Y) with a fourth larger cross-section equal to the first larger cross-section of the fifth point (F). The fifth and seventh points (F, Q) and the sixth and eighth (G, X) points are symmetrically positioned on the looped portion (20) with respect to the longitudinal axis (L).

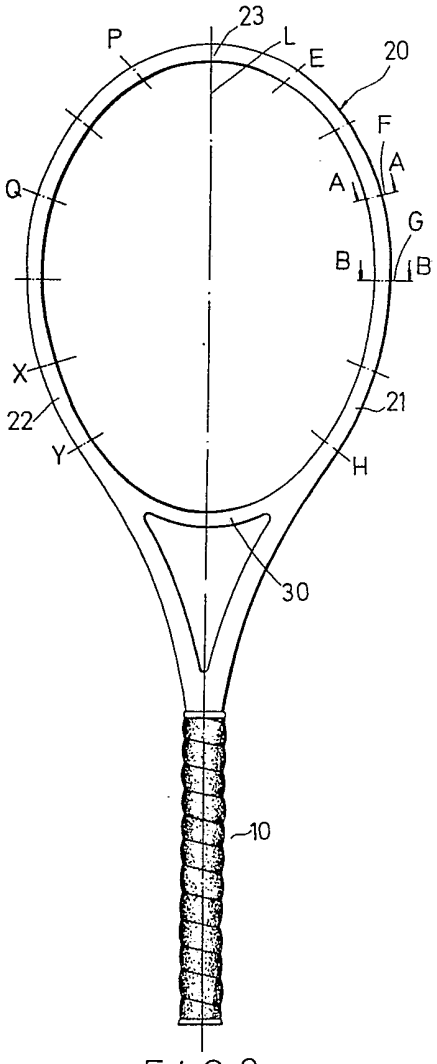
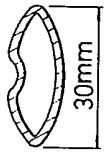


FIG. 2



A–A



B–B

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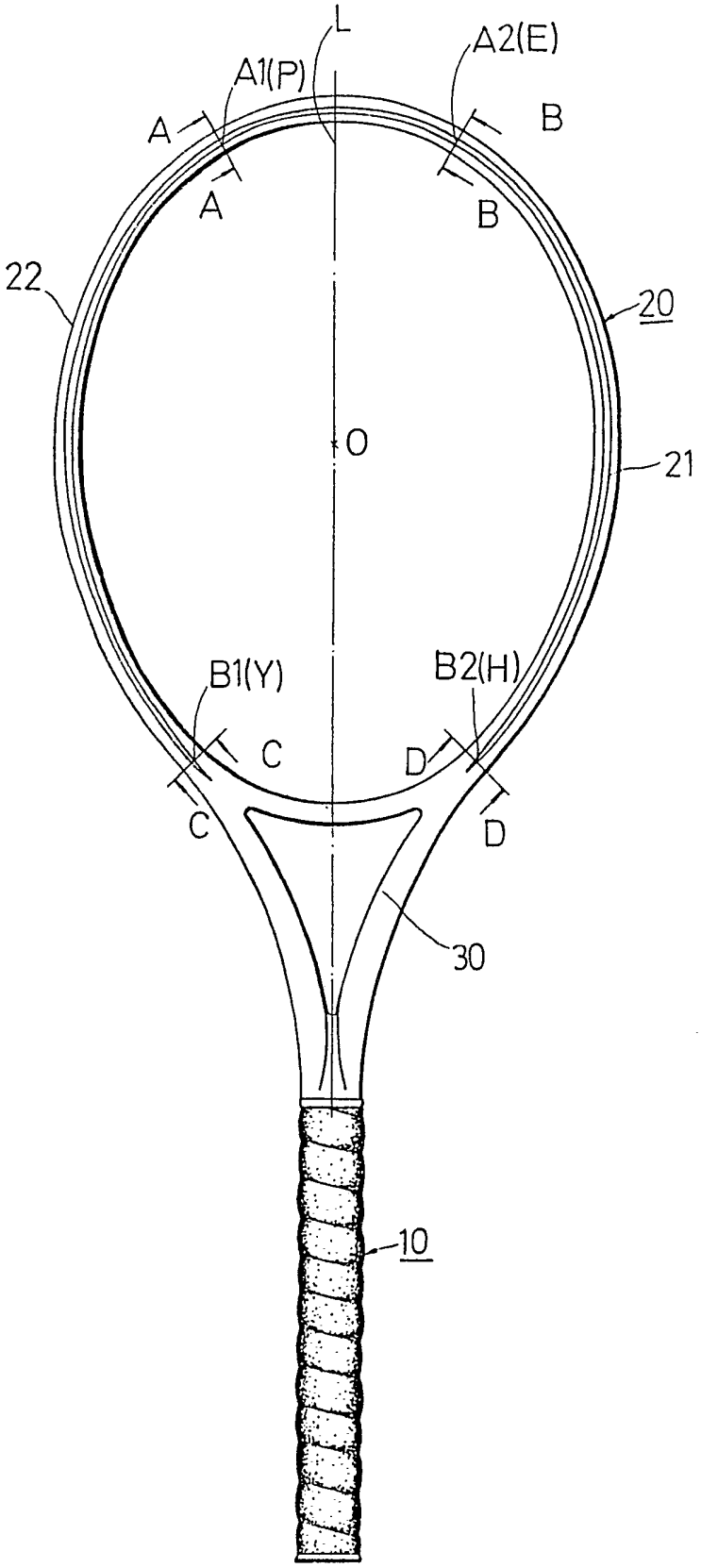


FIG.1
PRIOR ART



A－A



B－B



C－C



D－D

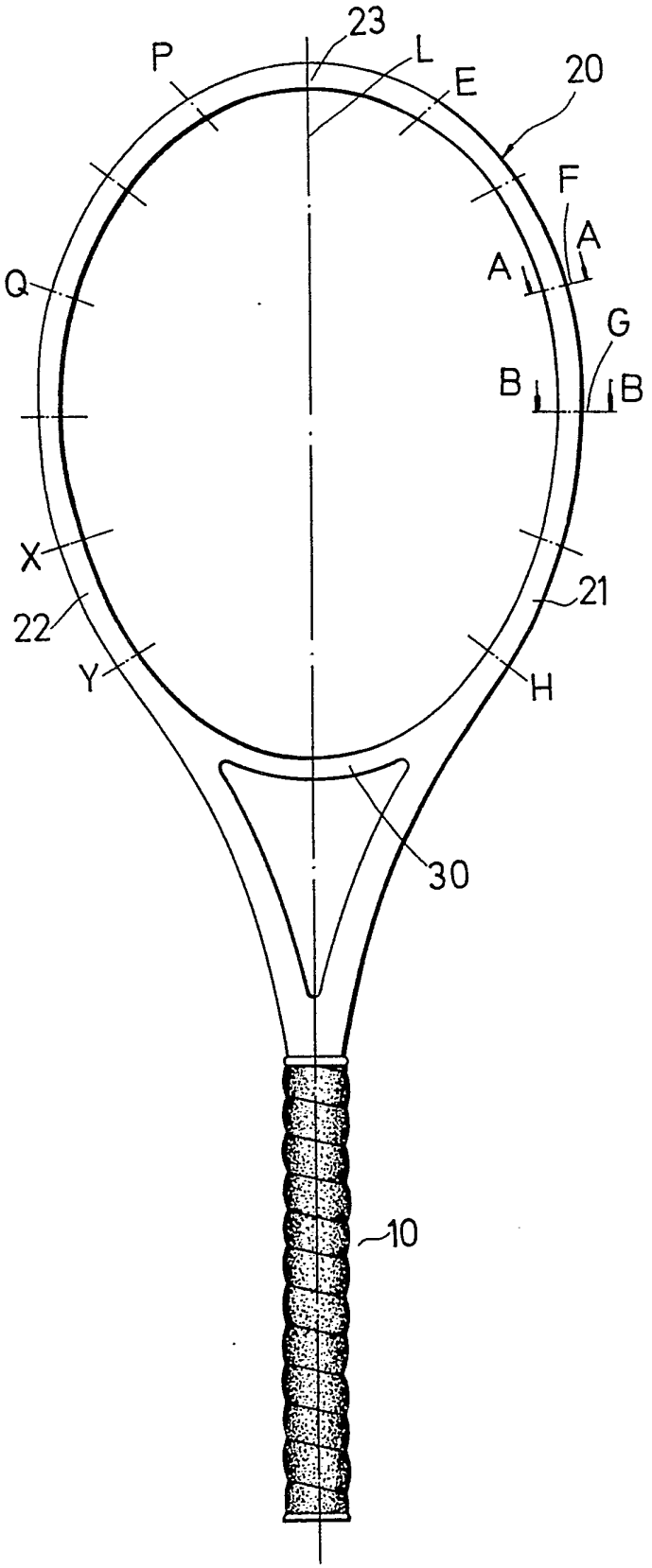
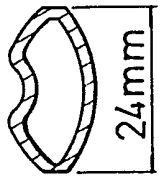
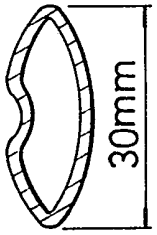


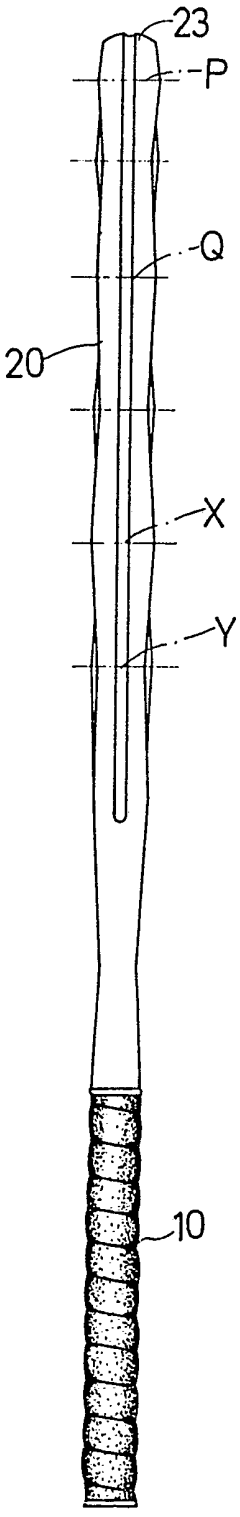
FIG. 2



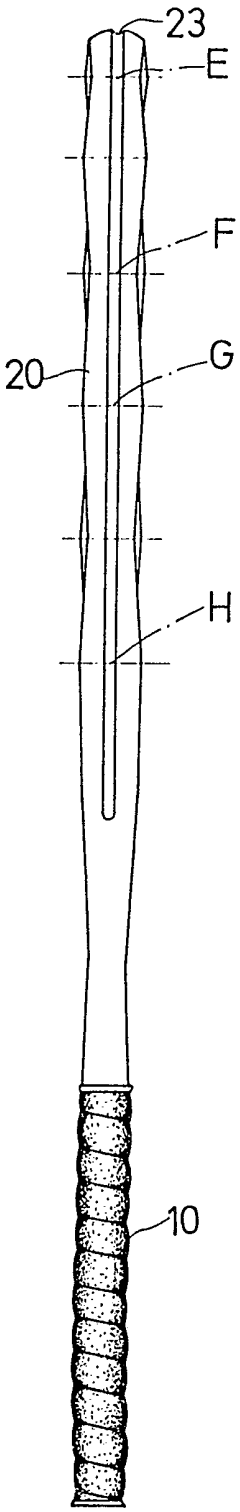
A-A



B-B



(A)



(B)

FIG. 3

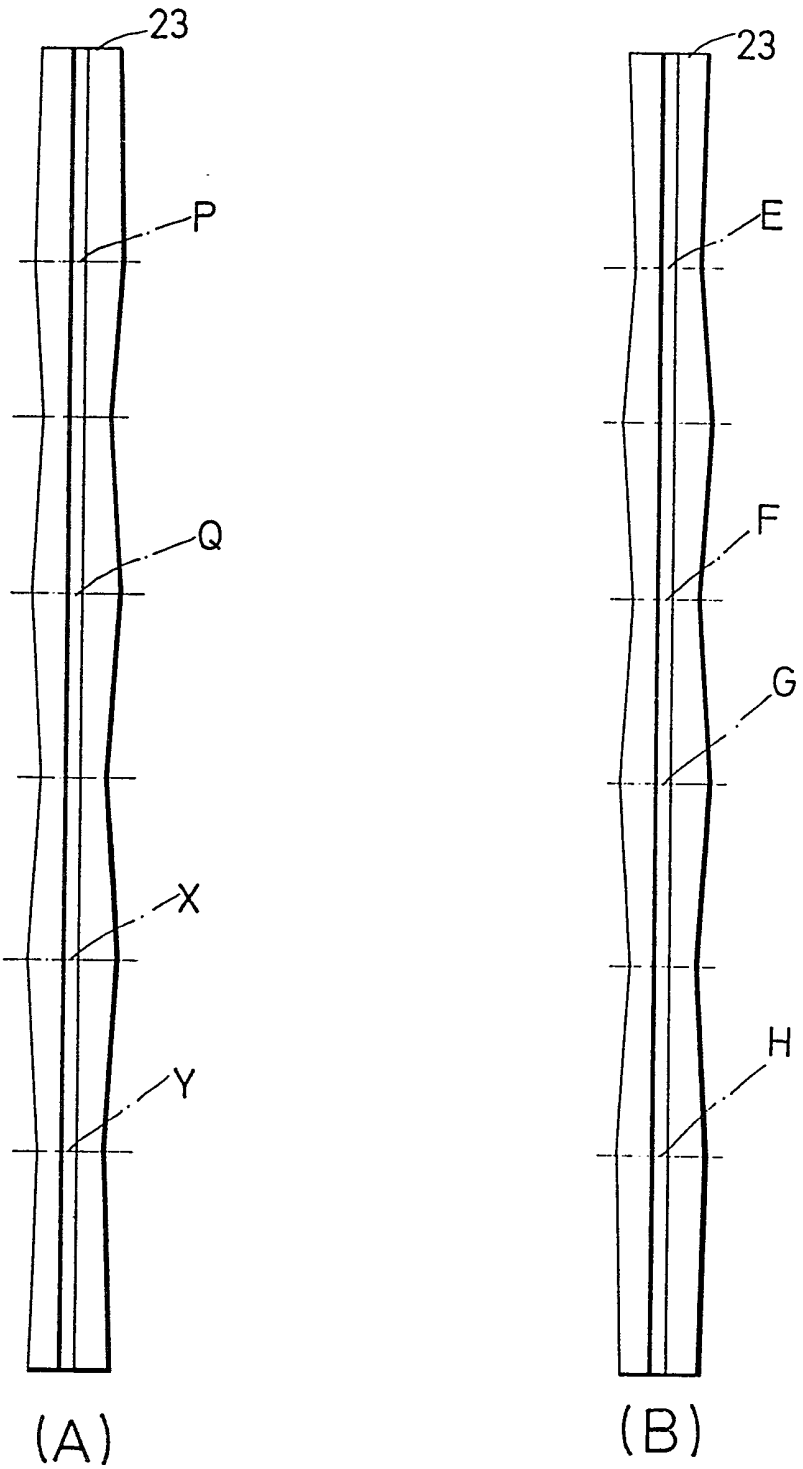


FIG. 4

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RACKET FRAME WITH SHOCK ABSORBING CHARACTERISTICS

This invention relate to a racket frame, more particularly to an improvement in the construction of the looped portion of the racket frame disclosed in U. S. P. No. 5,048,830, which racket frame has shock absorbing characteristics.

In playing tennis, it is a common phenomenon that shocks are initiated at the string web woven across the looped portion of the racket frame when a ball strikes the string web. The vibrations from the shocks are transmitted from the looped frame, the shaft and the grip of the racket frame to the hand of the player. Thus the player is easily fatigued, sometimes even injured, if he plays a series of matches.

In order to alleviate or reduce the problem of shock, many shock absorbing means have been developed and added to the art. Most of the shock absorbing means are provided at the string web or at the looped portion of the racket frame. U.S.P. 5,048,830 discloses a racket frame which has a shock absorbing means provided at the looped portion of the racket frame. Thus, occurring in such a racket frame is greatly reduced.

It has been the intention of every inventor to reduce the drawbacks of an article to a minimum level, thereby providing for the most efficient use of said article.

It is, therefore, a main object of the present invention to provide a new construction to be added to the looped portion of the racket frame of said U. S. Patent so that the racket frame has fewer shocks than the previous racket frame.

The above-mentioned U.S. Patent discloses a racket frame that includes a looped portion, a shaft portion and a throat portion between the looped portion and the shaft portion and has a first and second portion divided by a longitudinal axis which extends along the shaft of the racket frame and which passes through the throat portion of the racket frame and through an uppermost portion point opposite to the throat. The looped portion has a gradually varying cross-section in full length. The first portion has a first point of smallest cross-section adjacent to the uppermost point and a second point of largest cross-section adjacent to the throat. The second portion has a third point of largest cross-section adjacent to the uppermost point and a fourth point of smallest cross-section adjacent to the throat. The first and third points and the second and fourth points are symmetrically positioned on the racket frame with respect to the longitudinal axis.

According to the present invention, additional points are added as follows: a fifth point with a first larger cross-section between the first and second

points of the first portion; and a sixth point with a second smaller cross-section between the fifth and second points; a seventh point with a third smaller cross-section between the third and fourth points of the second portion and an eighth point with a fourth larger cross-section between the seventh and fourth points of the second portion. The first larger cross-section is equal to the fourth larger cross-section, and the second smaller cross-section is equal to the third smaller cross-section. The fifth and seventh points, and the sixth and eighth points are symmetrically positioned on the looped portion of the racket frame with respect to the longitudinal axis.

Other features and advantages of the present invention will become more apparent in the following detailed description, including drawings, all of which show a non-limiting form of the present invention, and of which:

Figure 1 shows a perspective, schematic view of the racket frame of the cited U. S. Patent.

Figure 2 shows a planned view of the preferred embodiment of the present invention, two small portions illustrating a sectional view taken along A-A and B-B, respectively of the preferred embodiment.

Figures 3(A) and 3(B), respectively, show a left and right side view of the preferred embodiment of Figure 2.

Figures 4(A) and 4(B), respectively, show an enlarged view of Figures 3(A) and 3(B).

Referring to Figures 2 to 4, a racket frame according to the present invention comprises a shaft portion (10), a looped frame portion (20), and a throat portion (30) formed between the shaft and the looped frame (20). The looped frame portion (20) has a first portion (21) and a second portion (22), located on the two sides of the longitudinal axis (L) of the racket frame, respectively. The longitudinal axis (L) extends along the shaft (10) and passes through an uppermost point (23) of the frame (20) and through the throat portion (30).

The cross-section of the looped frame (20) is not uniform. The cross-section gradually decreases from a point to a forward point and increases from that forward point to another forward point. Thus, the whole length of the cross-section of the looped frame is formed in the same manner. To be more detailed, the first portion (21) has a first point (E) of smallest cross-section adjacent to the uppermost point (23) and a second point (H) of largest cross-section adjacent to the throat (30). The second portion (22) has a third point (P) of largest cross-section adjacent to the uppermost point (23) and a fourth point (Y) of the smallest cross-section adjacent to the throat (30).

It is important to note that the first portion (21)

further has a fifth point (F) with a first cross-section located between the first point (E) and the second point (H) and a sixth point (G) with a second cross-section located between the fifth point (F) and the second point (h). The first and second cross-sections of the fifth and sixth points are equal to the largest and smallest cross-sections of the first and second points, respectively. The second portion (22) has a seventh point (Q) with a third cross-section located between the third point (P) and the fourth point (Y), and an eighth point (X) with a fourth cross-section located between the seventh and fourth points. Since the first and second portions are symmetric in size and dimension, the third and fourth cross-sections are respectively equal to the first and second cross-sections. Since the largest cross-section of the looped frame is 30mm and the smallest cross-section is 24mm, the cross-section of the whole looped frame (20) decreases and increases alternatively as shown in Figures 3(A) and 3(B). The cross-section of the looped frame (20) varies with the changing thickness of the looped frame as measured in a direction perpendicular to the plane of the looped frame.

Practical tests show and confirm that once the looped frame (20) of the racket frame of the present invention is provided as above, it causes less vibration in the string web of the looped frame, which

correspondingly does not easily fatigue a player's hand, the most distinguishing feature which is not achievable with the prior art racket frame.

I CLAIM:

1. A racket frame including a shaft portion, a looped frame portion and a throat portion between said looped frame portion and said shaft portion, said looped frame portion having an uppermost point opposite to said throat, having a first and second portion divided by a longitudinal axis which extends along said shaft portion and passes through said uppermost point and through said throat, and having a gradually varying cross-section; said first portion having a first point of smallest cross-section adjacent to said uppermost point and a second point of largest cross-section adjacent to said throat; said second portion having a third point of largest cross-section adjacent to said uppermost point and a fourth point of smallest cross-section adjacent to said throat; said first and third points being symmetrically positioned on said racket frame with respect to said longitudinal axis; and said second and fourth points being symmetrically positioned on said racket frame with respect to said longitudinal axis;

characterized in that said first portion further has a fifth point located between said first and second points which has a first larger cross-section and a sixth point located between said fifth point and said second point which has a second smaller cross-section;

said second portion further has a seventh point

located between said third and fourth points which has a third smaller cross-section equal to said second smaller cross-section of said sixth point, and a eighth point located between said seventh and fourth points which has a fourth larger cross-section equal to said first larger cross-section of said fifth point; and

said fifth and seventh points and said sixth and eighth points being symmetrically positioned on said racket frame with respect to said longitudinal axis.

2. A racket frame as claimed in Claim 1, characterized in that said cross-section of said looped frame portion gradually increases from said fourth point to said eighth point, decreases from said eighth point to said seventh point, increases from said seventh point to said third point, decreases from said third point to said first point, increases from said first point to said fifth point, decreases from said fifth point to said sixth point, increases from said sixth point to said second point and decreases from said second point to said throat.

3. A racket frame substantially described heretofore with reference to Figures 2 to 4.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number

9127528.9

Relevant Technical fields

(i) UK Cl (Edition K) A6D (D25A)

(ii) Int Cl (Edition 5) A63B 49/00, A63B 49/02

Search Examiner

D WHITFIELD

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

2 MARCH 1992

Documents considered relevant following a search in respect of claims

1-3

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

SF2(p)

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Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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