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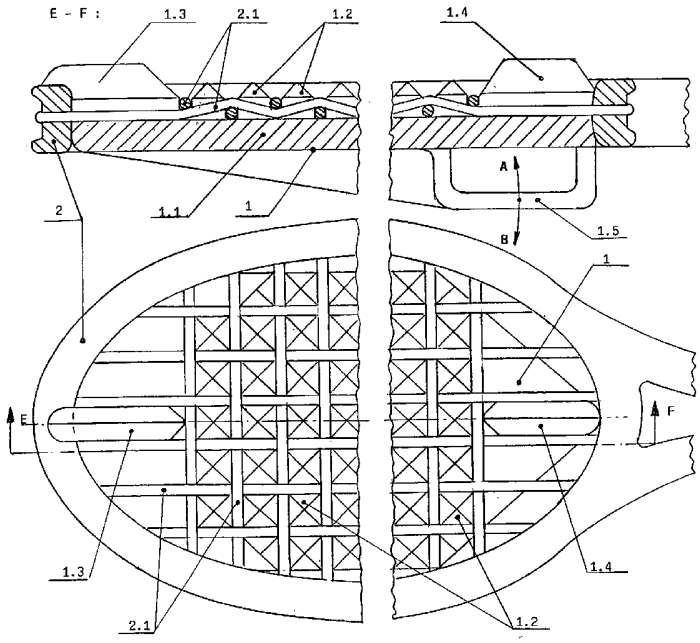
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Declaration under Rule 4.17:
— *of inventorship (Rule 4.17(iv)) for US only*

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** STRING ALIGNING DEVICE FOR RACKETS



(57) **Abstract:** Racket-raster matrix (1), consists of base-plate (1.1) and vertical protrusions on it (1.2), which by their arrangement on the plate, the shape of their base (rectangular, round or any other), maximum vertical and horizontal dimensions fit the inter-space of the correctly-originally positioned horizontal and vertical strings of a racket, which are horizontally and vertically entwined and adjustable. Simple insertion of the protrusions into the inter-spaces between the strings puts the strings into their correct-original position.

WO 2004/012824 A1

STRING ALIGNING DEVICE FOR RACKETS

Application of Patent:
This invention relates to racket-raster matrix (RRM), which enables tennis, badminton and other racket sports players to regulate the correct position of both horizontal and vertical or only horizontal/vertical strings of a racket, which [strings] are horizontally and vertically entwined and adjustable (moveable).

Technical Field:
Problem that tennis, badminton and other racket sports players face lies in the fact that, due to numerous impacts of the racket with the balls, strings of a racket tend to move out of their original position resulting in a formation of the gaps between vertical and horizontal strings.
This irregular position of the strings makes it difficult for the players to achieve desired collimation of the ball. Furthermore, if the irregular position is prolonged it will result in the loss of a tautness of the strings and the racket will loose its desired characteristics.

Background Art:
Up until now the players had to improvise to over-come this particular problem. Most often they use their fingers or whatever pointy objects are at hand in order to put the strings back in their original position. This has proven to be arduous as well as ineffective as it does not ensure co-ordinated adjustment of all of the strings throughout their entire length – something that this invention entirely achieves.

Disclosure of Invention :
Primary purpose of this invention is to achieve co-ordinated adjustment of some or all of the strings to their original position throughout their entire length.
Secondary purpose of this invention is to achieve an easy and measured collimation of the ball (when the strings are in their original position).
Finally, this invention seeks to prevent premature elongation of the strings, which occurs when the strings are in an incorrect position for a longer period of time.

Description of application of the invention
Racket-raster matrix (1- Fig. 1), consists of: base-plate (1.1) and vertical protrusions on it (1.2), which by the shape of their base (rectangular, round or any other), their maximum vertical and horizontal dimensions fit the inter-space of the relevant strings (2.1.) of a racket (2- picture 2) in vertical/horizontal trajectory and in a line-up that fits the shape of a rectangle between the strings of the racket. Upper part of the protrusions is compressed on all four sides so as to allow maximum dexterity of the penetration into inter-space of the relevant strings.

Height of the base of the protrusions must be at least two (2) times the width of the string. Protrusions are arranged (on the base-plate) in such way so as to penetrate every, every second or any other gap between the strings. The gap between adjacent protrusions equals the width of the strings (if every gap between strings is penetrated by one protrusion).

Both the front and the rear part of the base-plate have corresponding protrusions: front cog (1.3.) and rear cog (1.4) which, by its shape and dimension, helps to adjust and fix racket-raster matrix to the head of the racket. At the same time it allows easier and more secure insertion racket-raster matrix into head of a racket.

Detailed description of application of the invention

Racket-raster matrix (1, Fig. 1) is used in the following way:
The front cog (1.3.), which is higher than all other protrusions and compressed on all four sides, is inserted into front middle inter-space of the relevant strings (2.1.) of the racket (2 – Fig. 2).
(for easier identification of the relevant inter-spaces the player can mark it on the head of the racket).
Then, applying the principle of the leverage, all other protrusions of racket-raster matrix are inserted into corresponding inter-spaces of the relevant strings so as to allow the rear cog (1.4), which is also higher than all other protrusions and compressed on all four sides, to be fixed to the rear end of the head of the racket.

In this position the surface of the base-plate (1.1) of the racket-raster matrix is placed on the strings of the racket, while protrusions are inserted into inter-space of the strings to a maximum.

Pulling the banister (1.5) of racket-raster matrix in the opposite direction will allow racket-raster matrix (1) to be extracted form the racket, while vertical and horizontal strings (2.1) will stay in their correct –original position.

Racket-raster matrix can be affixed to a stool, beam, column or post, which is positioned on the end of the playing ground. When needed, a player can adjust the strings of the racket by positioning the racket on the stool, beam, column or post namely, on racket-raster matrix so that the top of the front cog penetrates the inter-space of the middle strings and is affixed to the front part of the head of the racket. Then, applying the principle of the leverage, while holding the handle of the racket, push all other protrusions into corresponding inter-spaces between the strings until the rear cog is safely settled into inter-spaces between the relevant strings. Racket is pulled out of racket-raster matrix by using a reverse technique, and the strings are reverted into their correct-original position.

PATENT CLAIMS

1. Racket-raster matrix according to the requirement 1, **characterized by**, that shape and the size of the base-plate are equal or slightly smaller than the inner part of the frame of the racket, and has a front and rear cog that helps to adjust and fix racket-raster matrix to the inner part of the frame of the racket.

2. Racket-raster matrix according to the requirement 2, **characterized by**, that base-plate has vertical protrusions, base of which can have a rectangular, round or any other shape, and whose dimensions fit the dimensions of the inter-space between the strings in the both horizontal and vertical direction or only horizontal/vertical direction. Height of such a base must be at least two (2) times the width of the string.

3. Racket-raster matrix according to the requirement 3, **characterized by**, that vertical protrusions, upper part of which is compressed on all four sides so as to allow maximum dexterity of the penetration into inter-space of the relevant strings.

4. Racket-raster matrix according to the requirement 4, **characterized by**, that the arrangement (positioning) of the protrusions is such so as to penetrate every, every second or any other gap between the strings.

5. Racket-raster matrix according to the requirement 5, **characterized by**, that the purpose of this invention is to achieve co-ordinated adjustment of some or all of the horizontal and vertical, or only horizontal/vertical strings [that are horizontally and vertically entwined and adjustable (moveable)] of tennis, badminton and other racket sports racket to their original position throughout their entire or selected length.

FIG.1

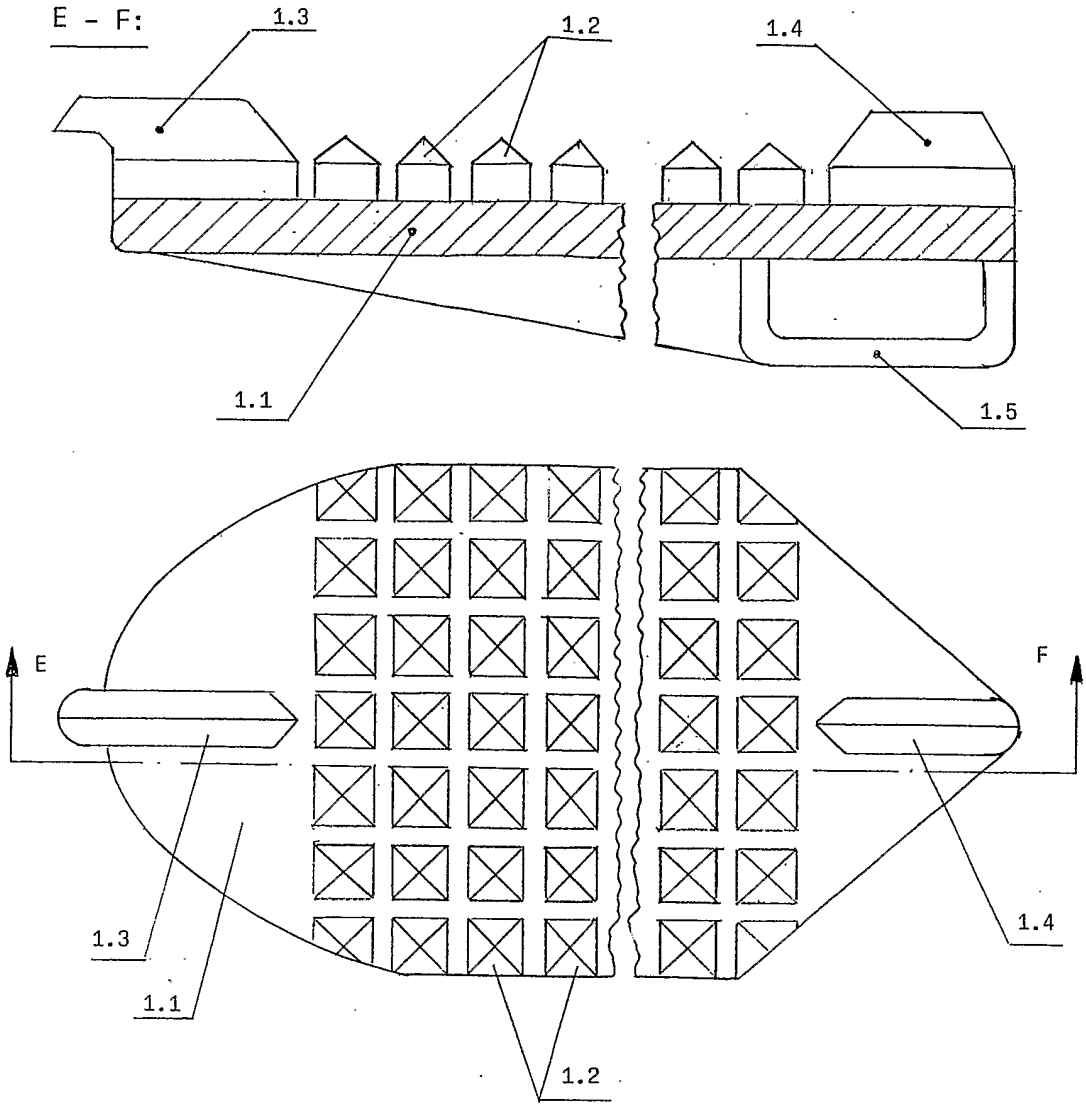
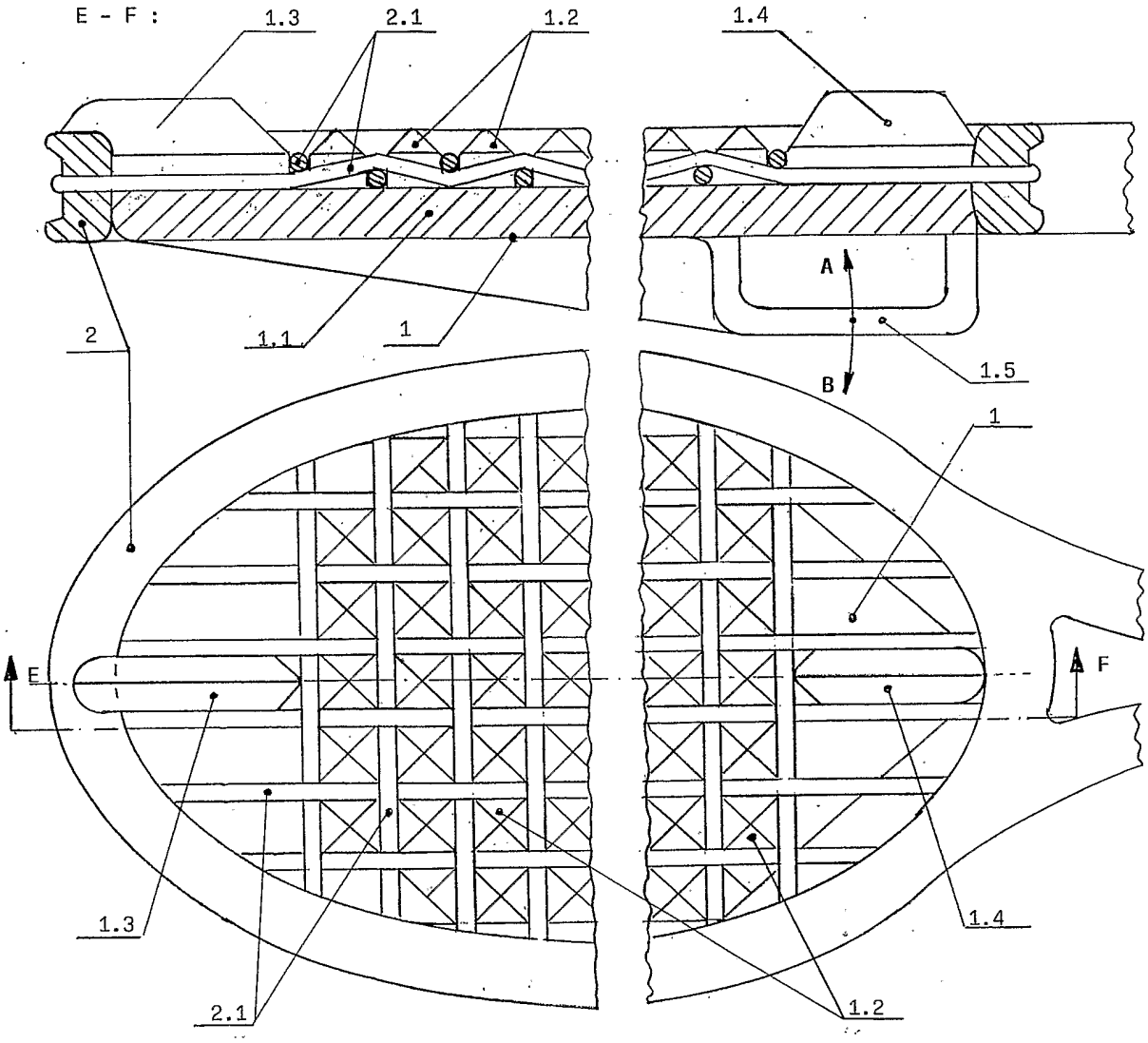


FIG.2



INTERNATIONAL SEARCH REPORT

Inte nal Application No
PC1/nR 03/00042

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A63B51/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 87 06 103 U (SCHROEDL, HEYKO) 9 July 1987 (1987-07-09) page 5, last paragraph -page 6, paragraph 3; figures 1-3	1-4
X	DE 91 15 043 U (GERICK, ROBERT) 6 February 1992 (1992-02-06) the whole document	1-4
X	US 5 441 258 A (PAGAN SALVADOR E) 15 August 1995 (1995-08-15) column 2, line 40 -column 3, line 68; figures 1-5	1-4
A	DE 197 13 437 A (SCHNEIDER REINHOLD) 29 January 1998 (1998-01-29) the whole document	1-4

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 December 2003	12/01/2004

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Fischer, E

INTERNATIONAL SEARCH REPORT

International application No.
PCT/HR 03/00042

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 1-4 (partially), 5
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-4 (partially), 5

Present claim 1 comprises the reference "according to the requirement 1". However, this "requirement 1" is neither defined nor comprehensible. Consequently, claim 1 has been searched disregarding this "feature".

Present claims 2-4 likewise comprise such a reference "according to the requirement ..", which has been equally disregarded for the search. The claims 2-4 have been searched as being dependent on claim 1.

Present claim 5 has not been searched, since this claim only defines the apparatus by reference to a result to be achieved ("the purpose of this invention is to achieve ..."), without defining any structural feature of the apparatus itself, thereby making a meaningful search impossible.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter I Application No
PCT/HR 03/00042

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 8706103 U	09-07-1987	DE 8706103 U1	09-07-1987
DE 9115043 U	06-02-1992	DE 9115043 U1	06-02-1992
US 5441258 A	15-08-1995	AU 3242395 A	07-03-1996
		WO 9604965 A1	22-02-1996
DE 19713437 A	29-01-1998	DE 29605814 U1	05-06-1996
		DE 19713437 A1	29-01-1998
		DE 29723767 U1	30-09-1999
		DE 29724024 U1	16-09-1999
		AU 4510797 A	07-11-1997
		WO 9738760 A1	23-10-1997