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<p>(54) Title: STRING TENSIONING DEVICE FOR USE ON RACKETS FOR BALL GAMES</p>		
<p>(57) Abstract</p> <p>Device for the adjustment of preferably ball game rackets which is intended to bring about the desired tension in a racket surface through adjustment of the tension in the strings and which consists of a triangular holder (1) provided with a groove (2) for the string and with an adjustment screw (5) whose tip is directed towards the apex of the holder, the screw tightening a string to the desired result by pressure.</p>		

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String tensioning device for use on rackets for ball games.

This invention relates to devices for adjusting stringtension in rackets. The invention is intended to bring about desired tension in the racket strings by increasing or decreasing the tension of the respective string. Ballgames with rackets are well known. Especially tennis is a sport of this category which has won more and more popularity in the last decades, But tennis is an expensive sport. Mainly the costs are related to the equipment. A tennisracket loses gradually the tension in the strings. The strings then have to be changed at a great cost. The problems related with this expensive method arouse my interest in trying to find an inexpensive and simple device for tensioning strings.

Known devices for tensioning racketstrings are very few. These known devices have in common that one can't adjust the string-tension individually. Nor is it possible to tighten the strings in opposite directions and thus obtain alternatly tightning interaction by the strings themselves.

It is an object of this invention to solve the above mentioned problems by a tensioning device which makes it possible to tighten every string individually and to the desired tension. This effect is won independently of the primary tension in the strings. Another advantage according to the invention makes it possible to obtain interaction between the strings when using the tightening device by tightening in opposite directions in relation to the closest crosswise string. The strings can of course be tightened in any desired direction. With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particulary pointed out in the specification, drawings and claims appended hereto.

The invention is not limited to the embodiments shown, it is apparent for those skilled in the art that modifications could be done without departing from the spirit of the invention.

Fig 1 shows two devices according to the invention.



It shows two tightening devices, their position on the strings and their interrelated placing. When two strings side by side are tightened. This is due to that the essential function of the invention consists in that the strings are tightened more or less in different directions in dependence of the position of the strings in relation to the downmost and closest cross-wise string. When two strings side by side are to be tension-adjusted two tension devices are used and are positioned in opposite directions.

Fig 2 shows a front view of the device according to the invention placed on a string before the adjustmentscrew (5) is screwed in the device behind the string and thus affecting the string to bend and increase its tension.

As an alternative a modification is shown where a pullthread (11) is used which can tighten the string by first passing the pullthread through the left hole (9) and then behind and around the string and finally passing the thread back to the front through the right hole (10) after which the pullthread (11) can be used to effect the stringtension. The pullthread (11) can be fixed by means of a knot.

Fig. 3 shows an oblique sectional front view of the device according to the invention in order to give a clearer view of the guiding groove where the string is forced forward or backward by the adjustmentscrew when the string is tensionadjusted.

Fig. 4 shows a tennisracket exemplifying how the devices can be mounted on a racket. In this case the tension is distributed to the same extent in the strings outwards of the devices as in the two longest middle lengthwise strings inside of the devices. In this way the same tension is retained in the middle strings when the tension, as a consequence of the players hitting the ball, is distributed over the entire racket area. That is, the tension of the 4 strings that have the devices decrease to the same extent that the tension of the other strings increase. According to the invention the device consists of a triangular holder (1) which in the middle of its bottom surface is provided with a lengthwise groove (2) intended to be placed in front of or behind the string which is to be adjusted.



Furthermore the holder (1) at the center of the bottom surface and in connection with the groove (2) is provided with a hole (3) directed towards the apex of the holder (1) and with a continuous slit (4) intended as a guide for the tip of the adjustment screw (5). In direct connection to the groove (2) there is a guiding slit (6) (fig.3) which is placed centrally in and lengthwise of the frame of the holder (1).

If for instance some lengthwise strings have become slack after a time of use of the racket and these strings need to be tightened and adjusted, this adjustment can be done in the following way with the device according to the device. The holder (1) is placed on a lengthwise string (7), on the same side as the nearest crosswise string (8), in such a way that the string (7) rests in the groove (2). Then the adjustment screw (5) is screwed into the hole (3) until its tip touches the string (7) after which the screw (5) is tightened a few turns more until the string (7) slips into the guide slit (6) in the direction of the apex of the holder (1).

The tightening of the string (7) has thus begun and the adjustment screw (5) is then tightened until the string (7) has the desired tension. If the nearest parallel string (7) is to be adjusted the tightening in the same way except that the holder (1) is placed on the opposite side of the string (7). Other strings in need of increased or decreases tension are adjusted in a similar way having due regard to their position in relation to the direction of the tension of other strings. In this manner the strings have been tightened individually to the desired extent and in the correct direction to its position in the racket. When the lengthwise strings in the racket are to be adjusted the devices according to the invention are placed close to the handle in accordance with fig. 4.

When adjusting with the pullthread (11) the thread (11) is inserted into the hole (9), around the string (7) and on until the thread comes out of the hole (10) where the thread (11) is tightened until the string has obtained the correct tension, after which the thread (11) is fixed by means of a knot or the like. If a decreased tension is desired the thread (11) is slackened.



on the adjustment screw (11) when the string (7) is extremely tightened, for instance when the balls have become very soft after long use or if the player for some other reason wishes to play with an abnormally high tensioned racket.



Claims

1) Device for the adjustment of the strings in preferably ball-game and badminton rackets which is an arrangement intended to bring about a desired tension in a racket surface through adjustment of the tension of the strings and which is characterized in that the strings in need of an increased or reduced tightening are tensionally adjusted separately by the pressure put upon the strings by an adjustment screw in different directions in dependence of the position of the string in relation to the nearest strings, which is made possible by a device consisting of a member (1) provided with a hole (3) which hole is intended for an adjustment screw (5) which with its tip is intended to put pressure on to a racket string (7) until this string, by adequate tightening of the adjustment screw, (5) has been given the desired tension.

2) Device for the adjustment of the strings in preferably ball game and badminton rackets in accordance with claim 1 characterized in that the member (1) is provided with a groove (2) for the string.

3) Device for the adjustment of the strings in preferably ball game and badminton rackets in accordance with claim 1 characterized in that the member (1) can be combined with at least one another member to a doubleacting device (fig.1) to facilitate the adjustments of the strings (7) in pairs or in greater numbers.

Fig. 1

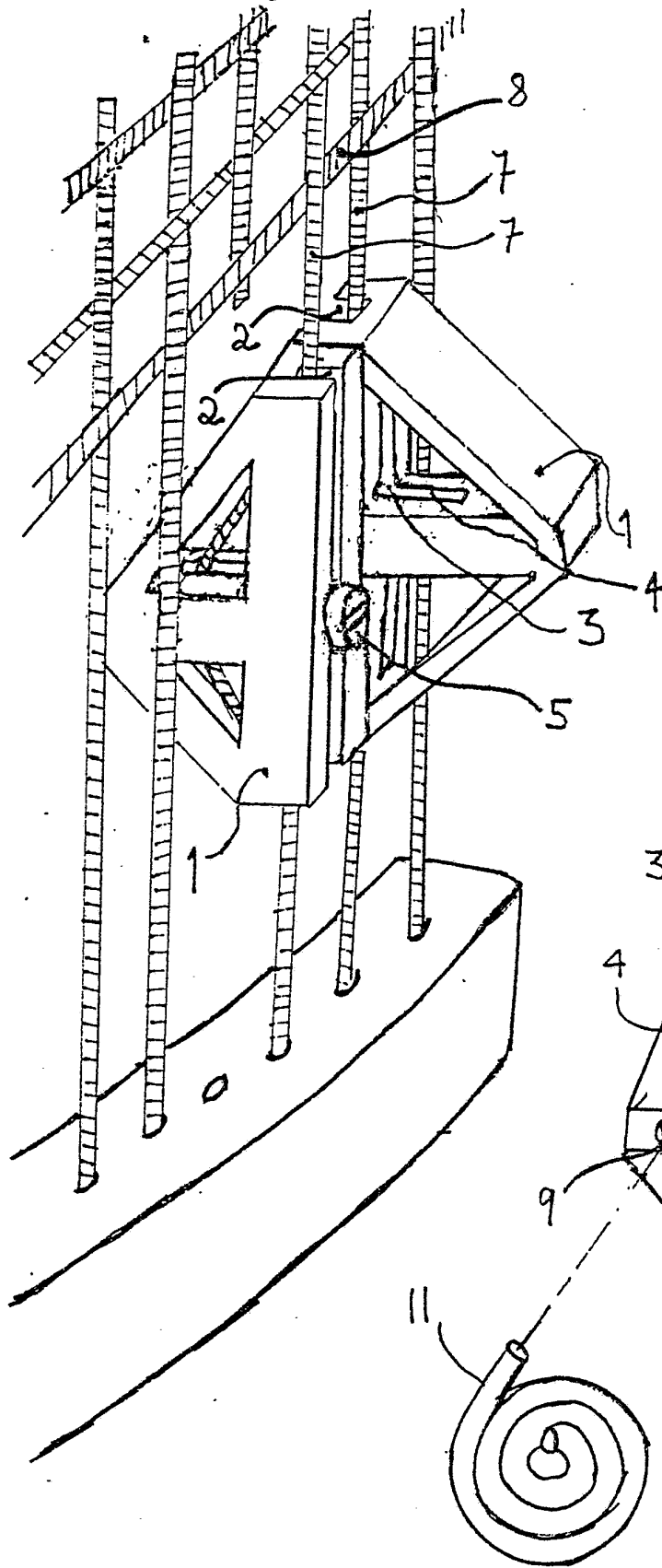
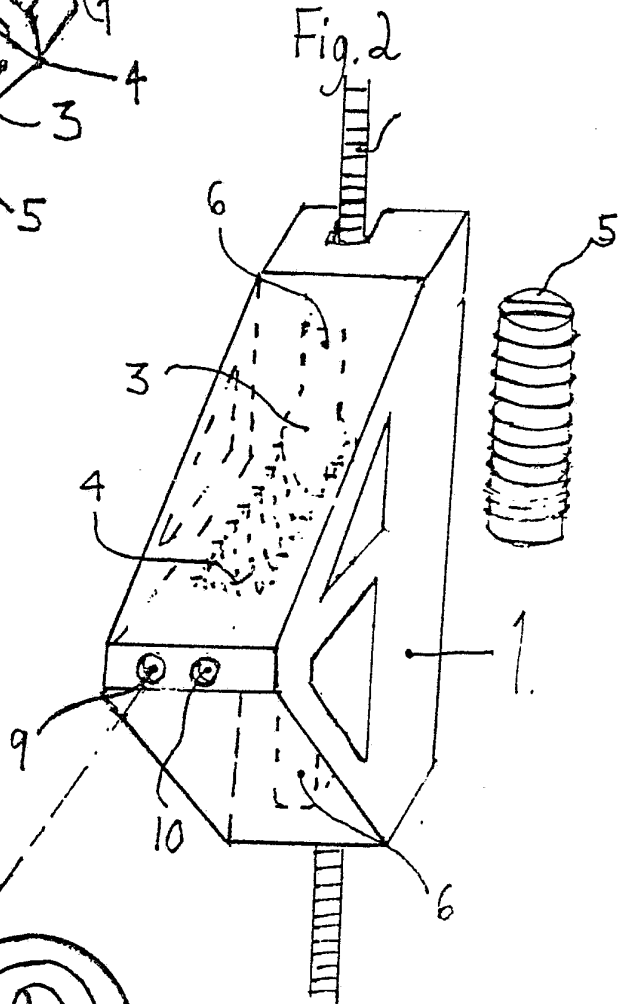
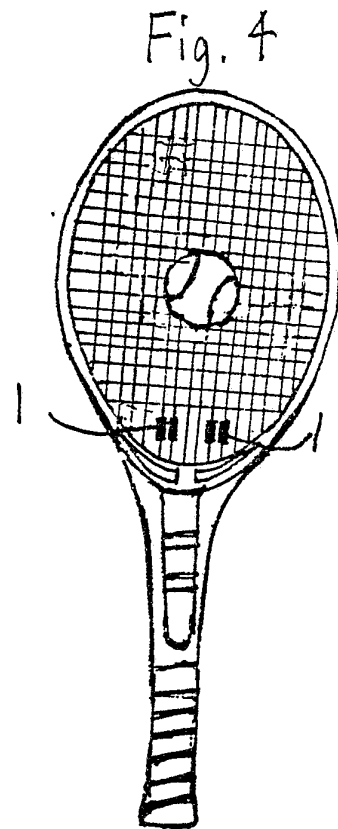
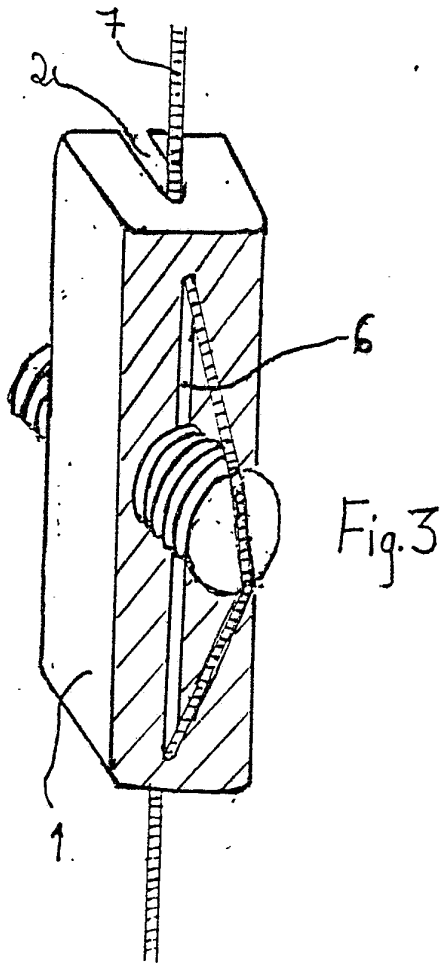
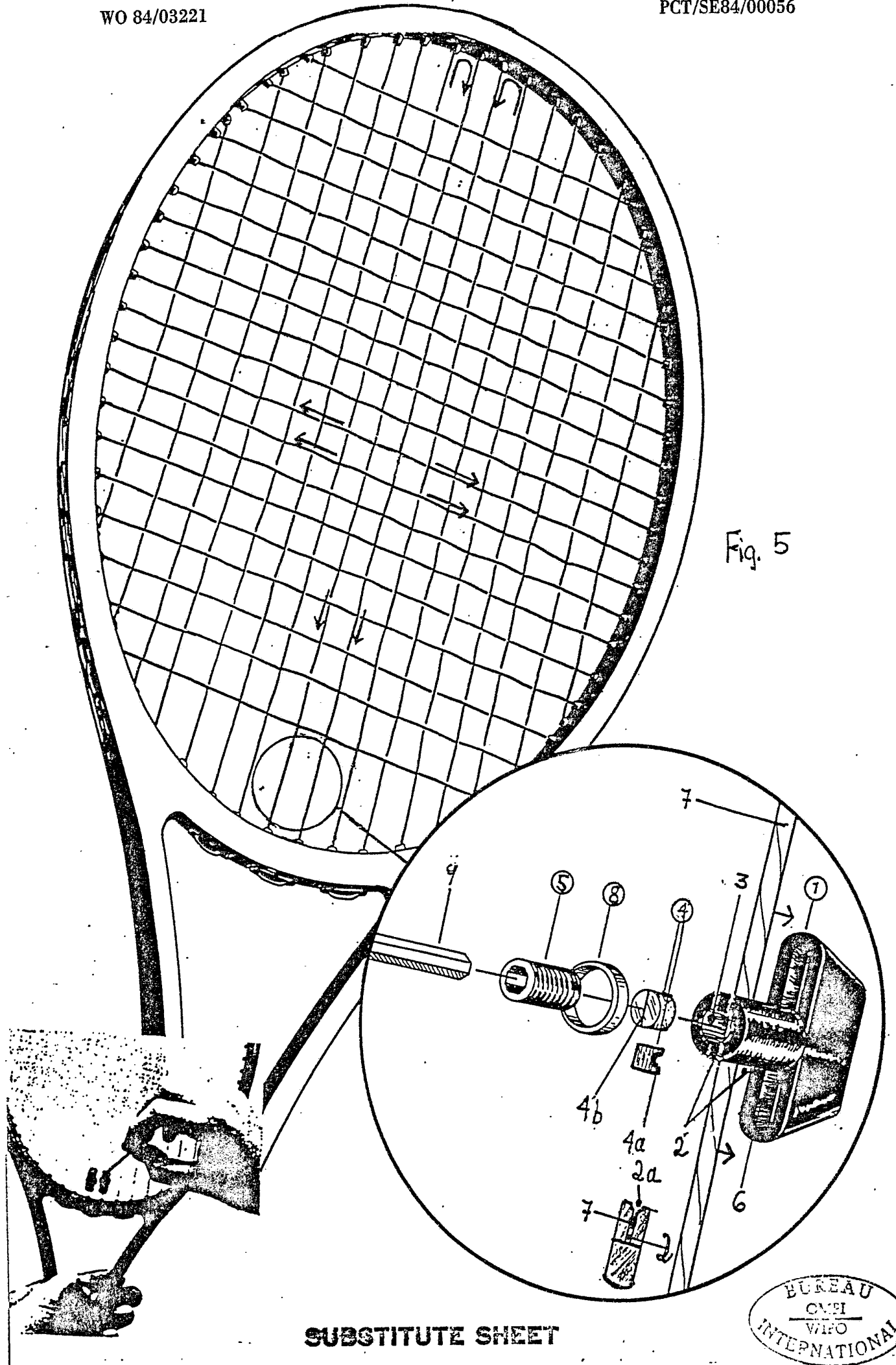


Fig. 2





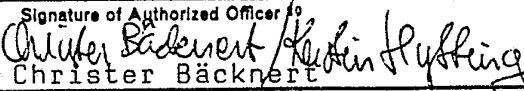


SUBSTITUTE SHEET



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE84/00056

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ²		
According to International Patent Classification (IPC) or to both National Classification and IPC ³		
A 63 B 51/12		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
IPC 3 US C1	A 63 B 51/00, 12; G 01 L 5/06; G 10 D 3/10-14 <u>273</u> : 73, 67; <u>73</u> : 145; <u>84</u> : 297-303	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
SE, NO, DK, FI classes as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category ⁶	Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
X	US, A, 1 140 282 (P D PARSONS) 18 May 1915	1
X	US, A, 4 340 225 (C R WILSON) 20 July 1982	1
A	DE, C, 347 306 (ANDS KOCH A-G) 17 January 1922	
A	GB, A, 187 463 (C BISAZ, U VITAL) 1 November 1921	
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IV. CERTIFICATION		
Date of the Actual Completion of the International Search ¹	Date of Mailing of this International Search Report ¹	
1984-05-02	1984-05-14	
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K.L.