



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification<sup>3</sup> :</b>  <b>A63B 13/00</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 86/ 07273</b>  <b>(43) International Publication Date:</b> 18 December 1986 (18.12.86)
<p><b>(21) International Application Number:</b> PCT/US85/01034</p> <p><b>(22) International Filing Date:</b> 3 June 1985 (03.06.85)</p> <p><b>(71)(72) Applicant and Inventor:</b> BROUSSARD, Robert [US/US]; 3102 E. Highland Avenue, Patton, CA 92369 N. 20 (US).</p> <p><b>(74) Agent:</b> SELDON, Robert, A.; 10920 Wilshire Blvd., Suite 1000, Los Angeles, CA 90024 (US).</p> <p><b>(81) Designated States:</b> AT, AU, BR, CH, DE, DE (Auxiliary utility model), DK, FI, FR (European patent), GB, JP, NL, NO, RO, SE, SU, US.</p> <p><b>Published</b>  <i>With international search report.</i>  <i>With amended claims.</i></p>		
<p><b>(54) Title:</b> PYRAMID WEIGHT PLATE EXERCISING APPARATUS</p> <div style="text-align: center; margin: 20px 0;"> </div> <p><b>(57) Abstract</b></p> <p>A weight plate (10) to be used in weight training affording alternate positions with respect to an attachable lifting bar (12, 14) so as to provide variable resistance with respect to leverage changes that occur through movement of the weight. A leverage control bar (16) is incorporated so as to provide an additional constraint for conditioning of selected muscles.</p>		

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Pyramid Weight Plate Exercising Apparatus  
Technical Field

The present invention relates to exercising apparatus in the weight-lifting field and more particularly to variable resistance devices, as contrasted to constant resistance devices, that will continually adjust to changing body leverages experienced in weight training movements. Constant resistance weight training devices are characterized by the property that there is no means of varying the amount of resistance as leverage changes occur with human movement. On the other hand, variable resistance weight training devices contemplate leverage changes that take place during the movement, for example, of a person's arm that cause changes in the amount of muscular force the involved muscles must exert in order to move the weight. Thus, if no property exists in a weight training device for varying the amount of weight resistance as leverage changes occur with human movement, then the resistance is constant and the weight training device is referred to as a constant resistance device. If, however, muscular forces change through a movement and such force changes are occasioned by a change in leverage condition, the device under consideration is referred to as a variable resistance device.

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BACKGROUND ART

Some of the background art has been described in the following listed patents that were brought to the attention of the applicant through a novelty search conducted in the United States Patent and Trademark Office.

#1 U.S. Pat. No. 460,270 Issued September 29, 1891

Patentee L.B. Somerby for DUMB BELL

Inventor Somerby termed his invention a "gyrating" or "eccentric" dumb-bell. It was contemplated that the weights would be rotated about the handle by a swinging or jerking motion of the hand. It was claimed that this kind of rotation of the weights exercises a great many muscles which are not called into play by conventional lifting and twisting of conventional dumb-bells.

#2 U.S. Pat. No. 793,101 Issued June 27, 1905

Patentee A.P. Schmidt for DUMB BELL

Inventor Schmidt provided a device upon which the weights could be varied by loading shot into split hollow metal heads serving as the bells. By use of an intermediate coupling the device may be arranged to be used as a low horizontal bar.

#3 U.S. Pat. No. 2,676,802 Issued April 27, 1954

Patentee M. O'Brien for BAR BELL

Inventor O'Brien has provided a weight-lifting device comprising weights in the form of discs having eccentrically located holes for receiving a connecting bar. The weight discs are journaled onto the connecting bar and incorporate roller bearings. It is therefore contemplated that the weights may be caused to swing back and forth like a pendulum or may even be caused to rotate throughout an orbital path.

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#4 U.S. Pat. No. 3,756,597 Issued September 4, 1973  
Patentee Louis F. Monti for PUSH PULL TYPE WEIGHT SHAFT  
EXERCISING DEVICE

Inventor Monti contemplates an arm exerciser that effects rotational movement of two weights about an axis within a connecting bar that joins the two weights. the weights described are fabricated of a deformable material and are containers that may store water, sand, shot or other flowable material. Handgrips incorporating springs resist movement of the handgrips along the connecting bar.

#5 U.S. Pat. No. 3,904,198 Issued September 9, 1975  
Patentee R.P. Jones for EXERCISE BAR

Inventor Jones provides a device that may receive interchangeable weights in the form of plates secured to dependent shafts by means of washers and nuts. Rotatable handgrips are provided so as to allow the weights so secured to the dependent shafts to move in a complete circle while various exercises are being performed. The handgrips are maintained in their correct positions along an elongate cylindrical member by means of a split ring-groove retaining structure.

#6 U.S. Pat. No. 4,103,887 Issued August 1, 1978  
Patentee R. Shoofler for BARBELL WITH COLLAPSIBLE LOAD  
CARRYING CHAMBERS

Inventor Shoofler describes collapsible enclosures which, when filled with water, sand, shot or other particulate matter, serve as the weight elements of a weight lifting device. The center of gravity of the device is situated between an opening for receiving a support bar and the aperture through which the water, sand, shot or other particulate matter is received into the collapsible enclosure. The opening for receiving the support bar is of

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sufficient size so that no torque is imparted to the bar as the device is being moved through an arc as in some weight lifting exercises.

#7 U.S. Pat. No. 4,312,506 Issued January 26, 1982

Patentee W.F. Brennan for BICEP EXERCISING CURLING BAR

Inventor Brennan describes a device in which the central portion of the weight carrying rod is offset from the weight supporting ends thereof. Padding is provided to relieve chafing and strain on the wrists, hands and forearms of the exerciser. One of the primary advantages of the invention resides in the facility that as the device is curled in the palms-up, supine, hand position, the center of gravity moves back behind the hand grip to a padded plate spanning the heel of the hand, the wrist and the lower forearm thus to relieve strain on the hands, wrist and forearm muscles.

#8 U.S. Pat. No. 4,327,908 Issued May 4, 1982

Patentee J.S. James for WEIGHT LIFTING BAR APPARATUS  
FOR EXERCISING BICEPS

Inventor James provides a holding frame to be hand-held by a user and a support frame to rest on a user's forearms with the weights being attached to a primary bar that is attached to the holding and support frames by arms. Use of the apparatus so described permits maximum exercise of the biceps without the traditional premature tiring of the forearm muscles, thus the biceps may be fully exercised.

#9 U.S. Pat. No. 4,396,968 Issued January 25, 1983

Patentee P.J. Price for LIFTING BAR ASSEMBLY

Inventor Price describes a lifting bar assembly in which device is incorporated a pair of brackets such that the assembly may be used for a bench press lift.

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Weights may be added and removed and secured upon a lifting bar by means of a collar and set screw assembly. Weights to be added or removed are provided with off-center holes for assembly to the lifting bar so that the apparatus may be used in a lift raising the lifting bar higher toward a ceiling of low height since the weights will not project materially above the lifting bar.

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DISCLOSURE OF INVENTION

The weight training apparatus as contemplated and disclosed in this patent application comprises weight training plates designed in the broadside form of truncated isosceles triangles with rounded base and corners. Each weight training plate will incorporate two lifting bar apertures to be distinguished by naming one the upper lifting bar aperture and the other the lower lifting bar aperture. The weight plates so designed will accept a lifting bar or rod and be secured thereto by means of collar and set-screw assemblies. If the lifting bar is attached to a pair of weight plates by means of their upper lifting bar apertures, substantially all of the weight of the plate will hang below the bar so that the plates can continually adjust to the changing body leverages experienced in most weight training movements. On the other hand, conventional disc weight plates have their bar apertures located only in the center of the disc so that half the weight remains continually above the lifting bar. Since most weight training exercises move in a curving pattern, because of the half of the conventional weight that remains above the bar, a loss of efficiency is suffered in the weight resistance that is offered to the exerciser.

Additionally, a leverage control bar is provided that is secured to the assembly through insertion of the bar into leverage control bar apertures also provided in the weight plates and by means of which the leverage control bar will rest against the forearm in a lifting exercise. The plates will thus be held at an angle and be prevented from swinging parallel to the forearm. Thus held, the pyramid plate will continually deliver maximum efficiency and apply maximum resistance. Of course, for selected exercise, the bar may be secured to the plates by means of the lower lifting bar aperture that is closer to the center-of-gravity of the plate.

For two-handed exercises, a longer bar may be attached to the weight plates than is used for one-handed



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exercises such as, for example, a dumbbell curl for individual bicep development. An elongated cylindrical tube, slideably receiving the lifting bar in its interior, allows the weight plates to be rotated about the bar as axis in carrying out other selected exercises. Of course, a longer tube will be used with the longer bar and a shorter tube will be used with the bar that is utilized in one-handed exercises.

The pyramid weight plates as designed in this invention are stable when set down on the floor or ground. By contrast, conventional round weights will roll and sometimes may cause damage or injury by that rolling characteristic.

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BRIEF DESCRIPTION OF DRAWINGS

Further advantages and features of the present invention will be more fully apparent to those skilled in the art to which the invention pertains from the ensuing detailed description thereof, regarded in conjunction with the accompanying drawings wherein like reference characters refer to like parts throughout and in which:

Fig. 1 is an end-side elevation of the pyramid weight plate.

Fig. 2 is a cross section of the pyramid weight plate taken along the sight lines 2-2 of Fig. 1.

Fig. 3 is an idealized profile view of an assembly contemplated for use in one-handed exercises.

Fig. 4 is an end-on view of the pyramid weight plate in use with the leverage control or restraint bar.

Fig. 5 is an end-on view of the pyramid weight plate in use with the plate secured to the lower lifting bar aperture.

Fig. 6 is an idealized profile view of an assembly contemplated for use in two-handed exercises.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring to Figs. 1 and 2 there is illustrated a pyramid weight plate in general denoted by the numeral 10. An upper lifting bar aperture is identified by the numeral 12 while a lower lifting bar aperture is denoted by the numeral 14. A leverage control bar aperture is denoted by the numeral 16.

Figures 4 and 5 illustrate the use of the apparatus in performing exercises. In Fig. 4 the lifting bar or rod 22 has been inserted into the upper lifting bar aperture 12 and the leverage control or restraint bar 28 has been inserted in leverage control bar aperture 16 and secured thereto by means of retaining pin 18. As shown, in a lifting curl, a user's forearm 30 will contact leverage control or restraint bar 28 so as to prevent the weight plate 10 from swinging about. Thus maximum efficiency and weight resistance may be maintained throughout the movement. In the inner curl movement shown the leverage control or restraint bar has been brought to bear against the user's outer forearm so as to prevent the weight from swinging inwardly toward the user's body. This exercise may be either a one-handed or two-handed lifting exercise.

In Fig. 5 the lifting bar or rod 22 has been inserted into the lower lifting bar aperture 14 and the leverage control or restraint bar 28 is not in use. In this configuration the weight plate may be rotated about the lifting bar as axis if desired. If, however, the leverage control or restraint bar 28 had been utilized, the restraint would have been imposed in some movements by that bar bearing against the user's inner forearm. Of course, if the leverage control bar had not been utilized in Fig. 4, the plate could also have been rotated about the lifting bar 22 as axis.

Fig. 3 shows a configuration of a lifting assembly contemplated so being useful in one-handed exercises. In addition to the weight plates 10, the lifting bar or rod 22 and the restraint bar 28 and retaining pins 18

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respectively, there are also shown weight retaining collars 20 securing weights 10 to bar 22 by means of set screws 26. A tube 24 encloses rod 22 so that the weights may swing about rod 22 as axis.

Fig. 6 shows the same components as Fig. 3 except that the rod 22 and its enclosing tube 24 are longer as is contemplated for two-handed lifting exercises. It is, of course, understood that when the apparatus is to be used in exercises that require continuous rotation of the weights about the rod 22 as axis, the leverage control or restraint bar is not used.

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INDUSTRIAL APPLICABILITY

The present invention will be utilized in gymnasiums, health spas and in private homes. It will find application both in two-handed and in one-handed weight lifting exercises. Additionally, exercises requiring development of muscular coordination may be performed by means of the rotatable facility of the device.

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CLAIMS

1. An apparatus for use in weight lifting exercises for manipulation by the hands of a user, comprising:

an elongated cylindrical lifting bar;

a bearing tube slideably telescoped over said cylindrical lifting bar over an intermediate portion of the length of said bar;

at least a pair of weight training plates, each designed in the shape of a truncated isosceles triangle with rounded base and rounded corners;

each of said weight training plates having an upper lifting bar aperture and a lower lifting bar aperture, each aperture being of a cross sectional dimension so as to receive the ends of said cylindrical lifting bar;

each of said weight training plates also having a leverage control bar aperture;

an elongated cylindrical leverage control bar sized so as to extend through said leverage control bar apertures in each of said weight training plates;

means to secure one of said weight training plates at each end of said elongated cylindrical lifting bar between the intermediate portions of said lifting bar covered by said bearing tube and the end of said bar;

means to secure said elongated cylindrical leverage control bar to said weight training plates.

2. The apparatus of claim 1 wherein said means to secure one of said weight training plates at each end of said elongated cylindrical lifting bar comprises a collar and set screw assembly.

3. The apparatus of claim 2 wherein said means to secure said elongated leverage control bar to said weight training plates comprises retaining pins.

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4. The apparatus of claim 1 wherein said elongated cylindrical lifting bar is of a length permitting two-handed manipulation by a user.

5. The apparatus of claim 1 wherein said elongated cylindrical lifting bar is of a length permitting one-handed manipulation.

## AMENDED CLAIMS

[received by the International Bureau on 23 September 1985 (23.09.85);  
new claims 6-8 added (1 page)]

6. (new) An apparatus for use in weight lifting exercises, comprising:

at least one weight training plate that is positionally stable when placed upon a plane horizontal surface;

5           said at least one weight training plate having at least one lifting bar aperture;

          said weight training plate having at least one leverage control bar aperture;

          an elongated cylindrical lifting bar of such  
10 cross section as to be received into said at least one lifting bar aperture;

          a bearing tube slideably telescoped over said elongated cylindrical lifting bar over an intermediate portion of the length of said bar;

15           an elongated cylindrical leverage control bar of such cross section as to be received into said at least one leverage control bar aperture;

          means to secure said at least one weight training plate to said elongated cylindrical lifting  
20 bar when said bar is received in said lifting bar aperture; and

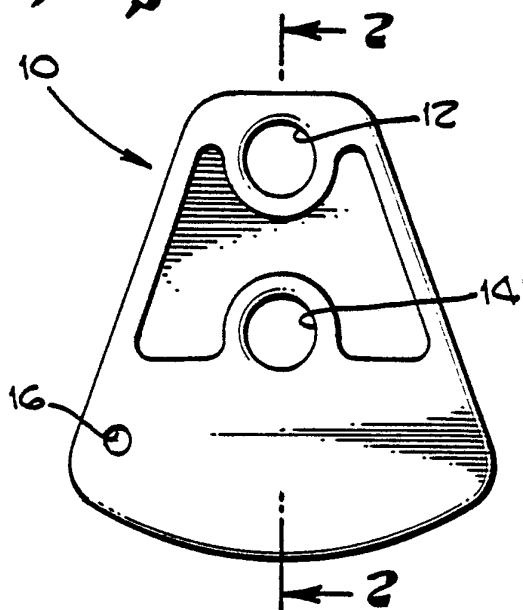
          means to secure said at least one weight training plate to said elongated cylindrical leverage control bar when said bar is received in said leverage  
25 control bar aperture.

7. (new) The apparatus of claim 6 wherein one of said at least one lifting bar apertures is an upper lifting bar aperture.

8. (new) The apparatus of claim 7 wherein one of said at least one lifting bar apertures is a lower lifting bar aperture.

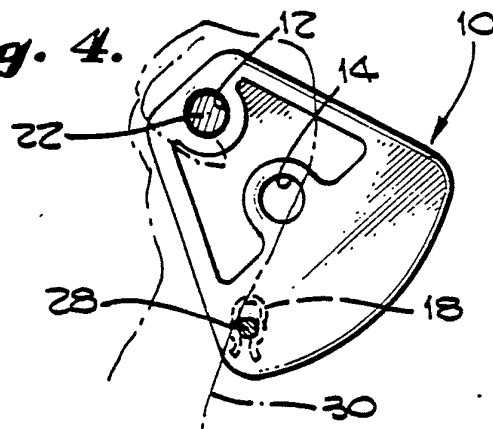


*Fig. 1.*

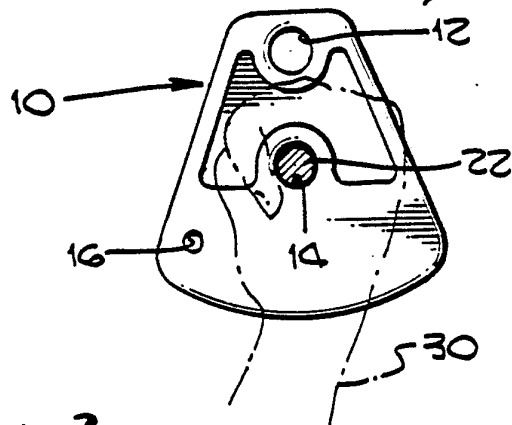


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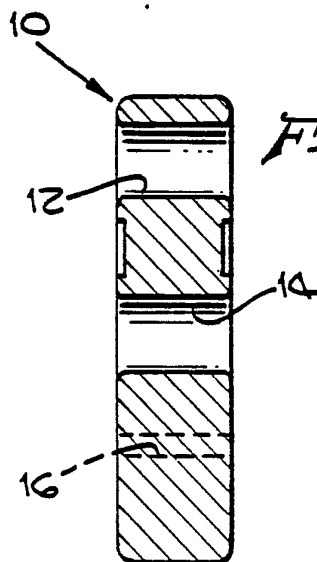
*Fig. 4.*



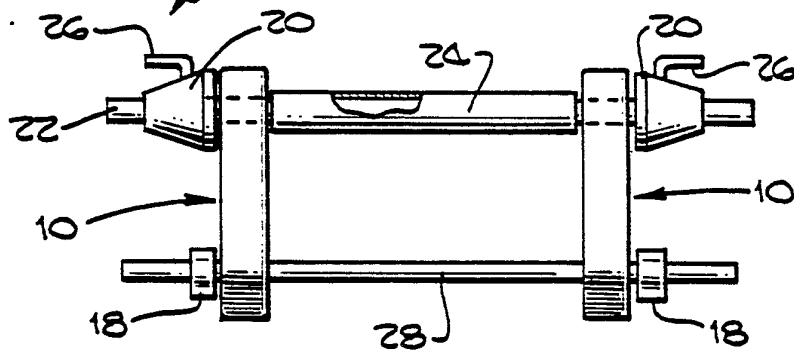
*Fig. 5.*



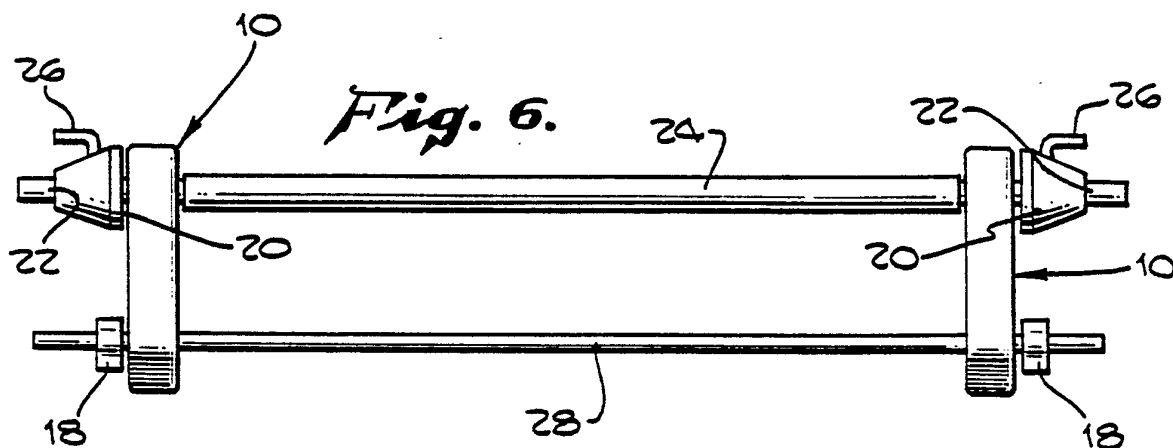
*Fig. 2.*



*Fig. 3.*

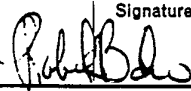


*Fig. 6.*



# INTERNATIONAL SEARCH REPORT

International Application No PCT/US85/01034

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>3</sup>			
According to International Patent Classification (IPC) or to both National Classification and IPC			
USC1 272/123 INTC19 A63B 13/00			
<b>II. FIELDS SEARCHED</b>			
Minimum Documentation Searched <sup>4</sup>			
Classification System	Classification Symbols		
US	272/93, 272/117, 272/122, 272/127; D21/191 272/116, 272/119, 272/123, 272/128; D21/197		
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>5</sup>			
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>14</sup>			
Category <sup>*</sup>	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Date	Relevant to Claim No. <sup>18</sup>
Y	US, A, 4,231,569	04 November 1980 RAE	1-5
Y	US, A, 4,103,887	01 August 1978 SHOOFLER	1-5
Y	US, A, 4,377,282	22 March 1983 HAYES	3
Y	US, A, 4,312,506	26 January 1982 BRENNEN	2, 4-5
A	US, A, 2,676,802	27 April 1954 O'BRIEN	1-5
A	US, A, 3,482,835	09 December 1969 DEAN	1-5
A	US, A, 3,781,007	25 December 1973 BAKER et al	1-5
A	GB, A, 21,900	12 October 1903 HARRIS	1-5
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><sup>*</sup> Special categories of cited documents: <sup>15</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 48%;"> <p>"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</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>			
<b>IV. CERTIFICATION</b>			
Date of the Actual Completion of the International Search <sup>1</sup>		Date of Mailing of this International Search Report <sup>2</sup>	
16 July 1985		06 AUG 1985	
International Searching Authority <sup>1</sup>		Signature of Authorized Officer <sup>20</sup>	
ISA/US		 RICHARD J. APLEY S.P.E.	