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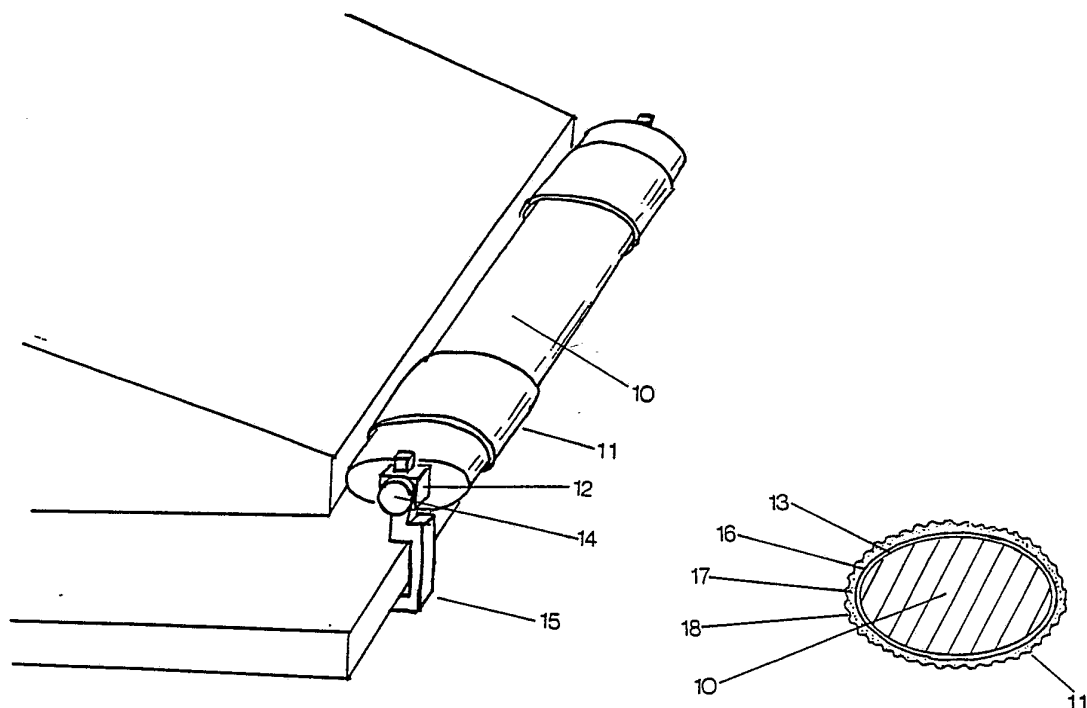
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(54) Title: HAND AND WRIST SUPPORT



(57) Abstract

A hand and wrist support for keyboard users and typists which serves to alleviate repetitive muscle strain by continuously following and supporting the arms. The support comprises of an elevated bar (10) which stands on the lateral legs (12) and two sliding sleeves (11) which run on the bar, providing a moving support surface for the hands. The height of the whole support can be controlled by adjustment mechanisms (14) which are found on the lateral legs.

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⁺ Any designation of "SU" has effect in the Russian Federation. It is not yet known whether any such designation has effect in other States of the former Soviet Union.

HAND AND WRIST SUPPORT

This invention relates to hand and wrist support for keyboard users.

Keyboard users such as typists and computer operators often suffer from neck and shoulder pain and discomfort. This is often as a result of having to hold their hand suspended over the keyboard while typing, over a prolonged period of time. This form of activity often results in repetitive strain injuries to cervical muscles, shoulder muscles, upper extremities muscles and injuries to the hands and wrists.

To overcome this problem there exists in the market, wrist supports for keyboard users which comprise of an elevated surface attached in front of the keyboard. Resting the wrist on these supports while typing allows some relaxation of neck, shoulder and arm muscles. However, these wrist supports are stationary and do not follow the operator's complex hand movements, thus they offer only an intermittent support, as the user has to repeatedly lift the hands off the support as the hands move across the keys.

During typing, the operator's hands move across the keyboard in a variety of ways. An anterior posterior translation motion of the wrist, hand and forearm in the horizontal plane from one line of keys to a line of keys above or below it. Also in the horizontal plane there is a movement of the hands in a bilateral translation motion from one key to an adjacent key to its side. Added to these movements, there is a small rotational movement of the wrists around the horizontal axis where the wrists flex and extend in response to the slight sloping surface of most keyboards.

It is an object of the present invention to provide a wrist support with continuous moving support, for keyboard users to alleviate these difficulties.

According to the present invention, there is provided a hand and wrist support for typists and keyboard users comprising of an elevated bar on which sliding wrist and hand support surfaces slide on and are capable of following the user's hand and wrist movements.

A specific embodiment of the invention will now be described by way of examples with references to the accompanying drawing in which:

Figure 1 - Shows the support in use in its position in front of the keyboard.

Figure 2 - Shows the front elevation.

Figure 3 - Shows a cross section of the support.

Referring to the drawing, the hand and wrist support comprises of an elevated bar 10 on which two sleeves 11 turn around the long axis of the bar and slide along the long axis of the bar in accordance with the movements of the hand and wrist.

The bar is elevated by means of two lateral legs 12 to allow the sleeves to slide freely without colliding with the table-top surfaces.

The bar can be of any shape in profile, but preferably its superior surface should be convex to allow for a rocking motion of the wrist in response to flexion extension cycles of that joint during typing. For that purpose a bar with an ellipsoid profile 13 or a round profile can be used. The surface of the bar should be of low friction material to allow smooth sliding motion of the sleeves. The bar is manufactured in any suitable rigid material, such as plastic, wood or metal.

The bar may be of a fixed height or have a height adjustment 14 on the two lateral legs, for height control of the support on top of the table, according to the individuals preferences, and type and height of keyboard used.

The bar can be of any length but preferably of a length which would correspond to the width of most commercial typewriters and keyboards.

The width or the radius of the bar should provide ample contact area to reduce contact point pressure at the hand and wrist.

The bar can rest on the table on its two lateral legs 12 or attached to the table top by clamps 15. Alternatively, the support can form an integral part of the keyboard, incorporated into the casing of the keyboard during the moulding process, or attached to the keyboard casing by adhesion or screws or clip-on means via the two lateral legs.

The sleeves 11 on which the hand and wrist rest are made of flexible materials which are capable of conforming and accommodating to the elliptical shape of the bar as they turn around its long axis. Materials such as rubber, low-friction elastic plastics, foamed material or woven material and fabrics can be used for the purpose of the sleeves.

The sleeves can be of any length or width, and should give sufficient contact area for the wrist to reduce contact-point pressure. The diameter of the sleeves is related to the circumference of the bar

The sleeves are made of one flexible material or a laminate of several flexible materials. The first layer 16 which forms the inner radius of the sleeve is made of a low friction material to facilitate sliding on the bar. These can be sheets of flexible plastic or woven fabric materials or any other suitable low-friction material. A second 17 cushioning layer can be added to reduce contact-point pressure. This layer can be of flexible foamed porous material, rubber, soft woven fabric materials or any other suitable material. This second layer can be lightly grooved 18 longitudinally to promote flexibility. A further laminate can be added as a final cover to the sleeve in the form of fabric material for aesthetic purposes and pleasing texture surface which is in contact with the skin.

Alternatively, if a round bar is used, the sleeves can be made of rigid low-friction material covered by a foamed cushioning surface. Furthermore, to improve the sliding motion, the sleeves may sit on low friction washers or ball bearings.

In a further embodiment of this invention, the bar can be of any shape in profile, channelled or grooved, with rigid sleeves functioning as runners. This would account for side-to-side movement of the sleeve on the bar. Tilting of the sleeve can be achieved by loose-fitting runners sliding on top of a slightly convex surface of the bar, or loose fitting runners with a single longitudinal ridge on the sliding surface over a flat surface bar, or by

the adding of a further surface or a rocker mechanism on top of the existing runners. The anterior posterior movement of the wrist and hand on the support could be achieved by adding a series of longitudinal rollers or ball bearings, on top of the two runners, or by adding another runner surface which has a transverse anterior/posterior motion on top of the existing runners, or by any other means of runners, rollers or ball bearings.

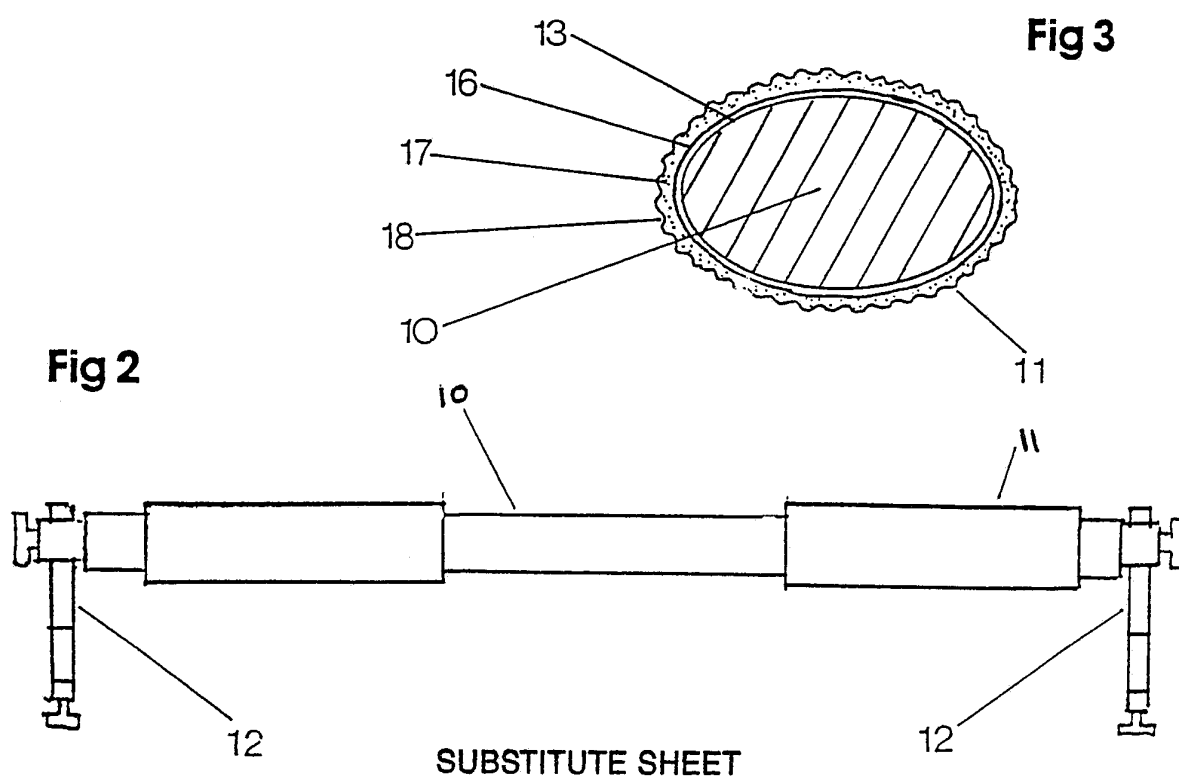
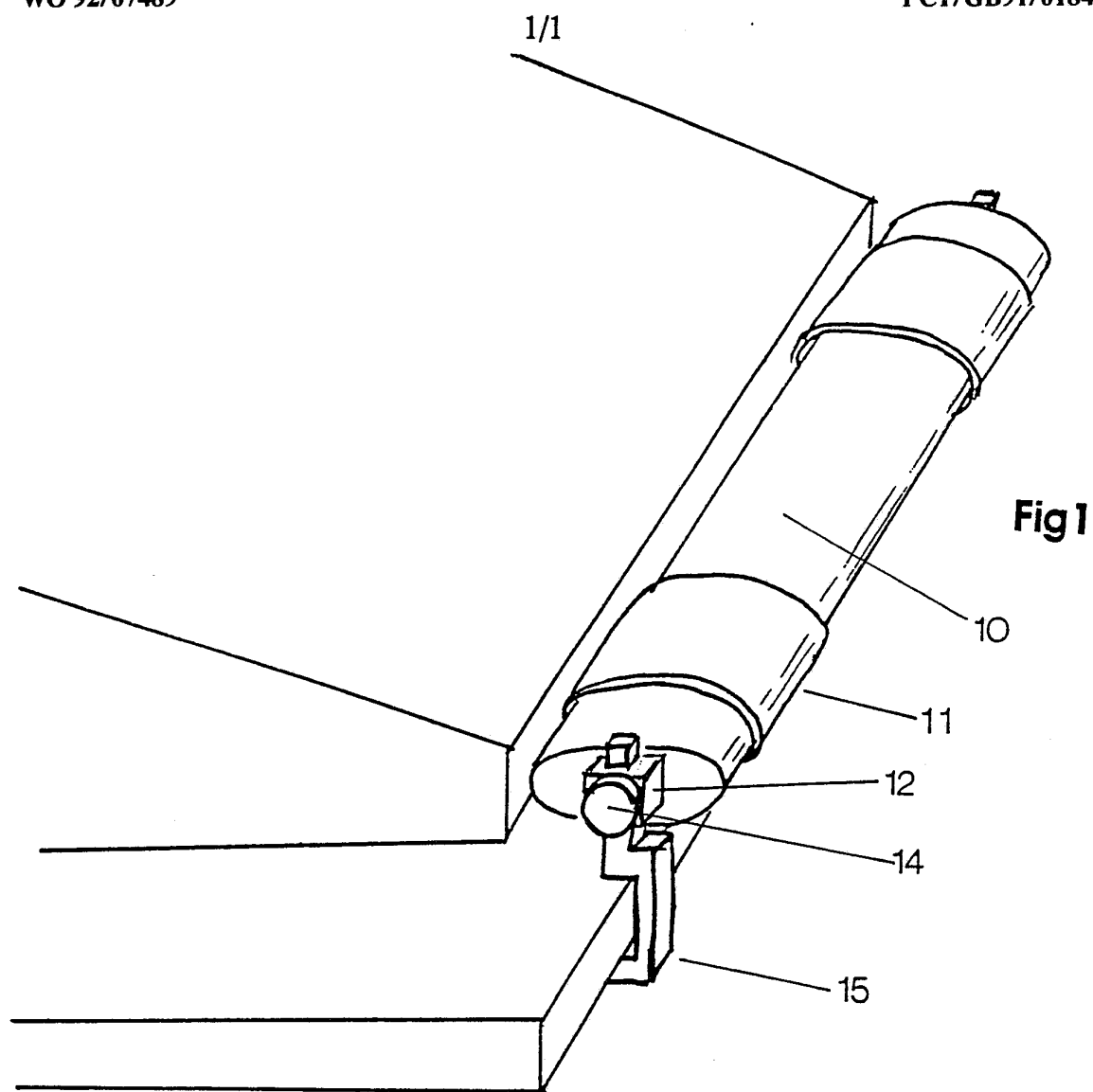
The present invention provides a hand and wrist support which is considerably simpler and cheaper to manufacture than any prior art proposals.

CLAIMS

- 1) A hand and wrist support for typists and other keyboard users comprising of an elevated bar on which sliding wrist and hand support surfaces move and are capable of following the users hand and wrist movements.
- 2) A hand and wrist support as claimed in Claim 1, wherein the sliding support means slide from side to side along the long axis of the bar in order to support and follow the hand movement from one key to the key next to it.
- 3) A hand and wrist support as claimed in Claim 1, wherein the sliding support means rotate around the long axis of the bar, in order to support and follow the hand movement from one line of keys to a line above or below it.
- 4) A hand and wrist support as claimed in Claim 1, wherein the sliding support means rocks, tilts or turns around it's own long axis in order to support and follow the flexion and extension movement of the hand at the wrist.
- 5) A hand and wrist support as claimed in Claim 1, wherein the sliding means of support move in anyone or all combinations of movement described in Claim 2 to Claim 4.
- 6) A hand and wrist support as claimed in Claim 1, wherein the sliding surfaces comprise a multiple sliding runner or rollers capable of moving in any one or a combination of movements described in Claim 2 to Claim 4.
- 7) A hand and wrist support as claimed in any one of the preceding claims, wherein the sliding surfaces are sleeves made of flexible material which conform to the profile of the bar on which it slides.
- 8) A hand and wrist support as claimed in Claim 7, wherein the sliding surface comprises of one or more laminates of flexible material which conforms to the profile of the bar on which it slides.

- 9) A hand and wrist support as claimed in Claim 8, wherein the first layer in contact with the bar comprises of flexible low friction material, to facilitate sliding.
- 10) A hand and wrist support as claimed in Claim 8, wherein the second layer comprises of flexible foam material as a cushioning layer.
- 11) A hand and wrist support as claimed in Claim 10, wherein the foam material is grooved longitudinally or transversely.
- 12) A hand and wrist support as claimed in Claim 8, wherein the laminated surfaces are further covered by fabric material.
- 13) A hand and wrist support as claimed in any of the preceding claims, wherein the profile of the bar is round.
- 14) A hand and wrist support as claimed in any of the preceding claims wherein the profile of the bar is ellipsoid.
- 15) A hand and wrist support as claimed in any of the preceding claims, wherein the superior surface of the bar is convex.
- 16) A hand and wrist support as claimed in any of the preceding claims, wherein the profile of the bar is shaped to correspond to the shape of the sliding sleeve parts.
- 17) A hand and wrist support as claimed in Claim 13, wherein the support sleeves are in the shape of rigid tubing.
- 18) A hand and wrist support as claimed in Claim 17, wherein the internal diameter of the rigid tubing has washers or ball bearings to reduce friction.
- 19) A hand and wrist support as claimed in Claims 17 and 18, wherein the external diameter of the rigid tubing is further laminated by cushioning material.

- 20) A hand and wrist support as claimed in Claim 16, wherein the bar is channelled or grooved with sleeves of corresponding shape which act as runners.
- 21) A hand and wrist support as claimed in Claim 20, wherein the runners are loosely fitting over a convex superior surface of the bar, with their own contact surface being flat.
- 22) A hand and wrist support as claimed in Claim 21, wherein the runners have a longitudinal ridge on their contact surface and superior surface of the bar is flat.
- 23) A hand and wrist support as claimed in Claim 20, wherein there are added surfaces to the superior surfaces of the runner which have rocking means.
- 24) A hand and wrist support as claimed in Claim 20, wherein the superior surface of the runner has longitudinal rollers or ball bearings.
- 25) A hand and wrist support as claimed in any of the preceding claims, wherein the height of the elevated bar can be adjusted, by adjustment means on the two lateral legs.
- 26) A hand and wrist support as claimed in any of the preceding claims, wherein the support forms an integral part of the keyboard.
- 27) A hand and wrist support as claimed in Claim 26, wherein the support is integrated into the casing of the keyboard during the manufacturing process of the keyboard.
- 28) A hand and wrist support as claimed in Claim 26, wherein the support is adhered, screwed, clipped-on or connected by any other means to the casing of the keyboard.
- 29) A hand and wrist support as claimed in any of the preceding claims, wherein the support comprises of means of attachment to a table top or to the keyboard.
- 30) A hand and wrist support substantially as described herein, with reference to Figures 1-3 of the accompanying drawings.



INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 91/01840

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 A47B21/03		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	A47B	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	DE,U,8 911 588 (HOLZRICHTER) 9 November 1989	1-8,9, 13, 15-17,19
A	see page 5 - page 11; claim 1; figures 1-3 ---	9
¹⁰ 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 "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		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
16 JANUARY 1992	30 JAN 1992	
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EUROPEAN PATENT OFFICE	NOESEN <i>Naesen</i>	

GB 9101840
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 16/01/92

DE-U-8911588	09-11-89	None
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