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(54) **ERGONOMIC WORK STATION**
ERGONOMISCHER ARBEITSPLATZ
STATION DE TRAVAIL ERGONOMIQUE

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Description

[0001] The number of persons who work whilst seated in a static posture, perhaps in front of a computer, is increasing progressively; as is also the number of hours in which such persons remain seated. Since the human body is not developed for purely static work, this type of work does not only result in an increasing degree of discomfort but is also liable to cause damage to the person's body, for instance muscle pains, attrition and other impairments. Although the causes of such injuries have probably not been fully investigated at the time of drafting this document, one of the factors involved is considered to be the reduced circulation in statically contracted muscles.

[0002] With the intention of improving ergonomics with respect to work that is carried out in a seated position there have been proposed over the years many constructions that provide effective adjustment possibilities so as to enable a working station to be adapted to suit precisely the person who shall use this station. In order to avoid, or at least reduce, purely static work, for instance with outwardly raised arms in the case of computer keyboard work, special wrist supports have been constructed (US 5,158,256). With the intention of enhancing circulation, there has been proposed furniture that has a built-in ability to make slight movements so as to enable a working position to be varied, for instance with the aid of a motor drive (US 6,296,408). An example of a work station with a movable work surface is described in US 6 158 359.

[0003] Improvement in the conditions of a statically seated worker with the aid of the measures involving the movement variations obtained by the continuous change of the working position with hitherto known devices is relatively small and the movements are not sufficiently dynamic to improve blood circulation to an extent required to reduce the danger of muscular pains among other things. Against this background, the object of the invention is to provide an arrangement with which circulation of the blood is improved as the work is carried out, as a result of continuous movement in the joints and muscles of the user's upper extremities.

[0004] This object is achieved in accordance with the invention by virtue of the work table, or a part thereof, which supports a keyboard being arranged to move along a movement path that extends down forwardly of the user. Moreover, the slope or inclination of the work table or the keyboard is coupled so that the table or the keyboard can be angled in the movement direction at the same time.

[0005] By designing the work surface in the manner described above it is possible to position in particular the working surface of the keyboard relatively far from the body and relatively close to the body without the user feeling any discomfort. The angular regions within which hands and fingers work can be maintained at an optimum while enabling arm and shoulders to carry out relatively large movements that result in considerably improving

circulation and corresponding improved comfort and well-being. On the other hand, continuous movement of a work table from and towards the body respectively in the same level results in a greater load on the spine and shoulder muscles when the work table (and the hands) are located farthest from the body.

[0006] With the intention of improving mobility still further during a working process, the keyboard may be arranged to also move backwards and forwards sideways.

[0007] It is conceivable within the framework of the invention for motorized operation to be achieved with the aid of cams, levers, etc or for the work surface to be movable along a guide means that is spring biased towards the user so that the user is able to press the work surface away from himself and so that the work surface will then slowly return, which can be achieved, for instance, with the use of a gas cylinder and a spring. The terminal positions can be determined with the aid of appropriate stops or by means of an appropriate length of stroke of the motorized arrangement. The work surface angling movement may also take place in conjunction with a terminal position stop means and the movement may take place at the same frequency as that of said work surface or at a different tempo. Movements of the work surface may also be program controlled. A work station according to the invention is described in claim 1.

[0008] Further developments of the inventive concept will be apparent from the accompanying claims and from the follow description of a preferred embodiment illustrated in the accompanying drawings, in which

Fig. 1 illustrates a work station according to the invention seen from one side in a first position, and Fig. 2 illustrates the same work station in a second position.

[0009] The illustrated work station includes a table 1. The table edge that faces towards the user 10 includes an indentation in which there is received a small work surface 3 that is movable in a path that extends downwards and in beneath the table, i.e. away from the user. The work surface 3 is suspended from pivot arms 4 and 5 mounted in a bracket 6 on the underside of the table and in a bracket 7 disposed on the underside of the work surface 3. An array of brackets and pivot arms is arranged at each end wall of the work surface. The pivot arms 4, 5 have mutually different lengths that result in a combined pivotal movement of the work surface 3 in a parallel manner. In the case of the illustrated embodiment, the work surface angles away from the user when the work surface moves forwards and downwards.

[0010] As will be seen from figures 1 and 2, the angle between the user's hand and the work surface is maintained regardless of the angular forwardly displaced position of the work surface. This means that the user's hands 11 are able to maintain their position relative to the keyboard and to any associated support over the full movement path of the work surface 3, at the same time

as the wrists of the user work at different angles in relation to the user's forearms. In this way, movement in the tendons that connect the fingers with associated muscles will be superimposed.

[0011] Also the elbow joints and the shoulders of the user will be continuously subjected to angular changes during the motorized movement of the work surface backwards and forwards between the positions shown in figure 1 and 2.

[0012] The motorization for achieving the reciprocating movement of the work surface can be effected with the aid of a link connected to a motor-driven eccentric element. An eccentric rotating position corresponding to the position of the work surface 3 in the plane of the table 1 can be detected with the aid of a sensor and the motor then stopped, therewith allowing the motorized work surface to be stopped automatically and returning to this position.

[0013] Movement of the work surface is restricted in its entirety by abutments and eccentric dimensions, and the length of stroke is beneficially variable between 0 to 40 cm in respect of the table and with a pivoting time period of up to 10 min.

[0014] The work surface 3 is also movable sideways, which can take place in the work surface's own tempo or which may, alternatively, be synchronized with one of the two other movements. Instead of allowing the whole of the work surface to move sideways, it is conceivable to allow only a part of the work surface to move sideways and to carry or support a keyboard in a manner that is not disclosed. Such sideways movement of the keyboard will ensure that the reciprocating movement of the arms will not pass exactly along the same path every time, therewith reducing the risk of wear while improving the blood supply.

[0015] The motorized movement or movements need not follow the same cycle every time, and the length of stroke and the turning points can be varied in time, for instance by reversing the rotational direction of the motor. This variation may also take place randomly.

[0016] Instead of a motorized arrangement, an arrangement is conceivable in which the user is able to press the table away from him/her against the action of a spring. It is also conceivable for the table to include a limited spring effect in addition to the motor drive.

[0017] The desired movements and their respective movement areas may also be achieved with other movement elements than those described, for instance with the use of co-acting linear guides that permit varying movement paths to be achieved.

[0018] By avoiding a static working position, the work carried out is more comfortable and less tiring.

Claims

1. A work station, particularly a work station relating to a computer keyboard, wherein the work station in-

cludes a movable work surface (3), a motor which is adapted to drive the work surface (3) downwards and forwards from an upper position to a lower position and back to said upper position, **characterized in that** the motor is adapted to drive the work surface (3) continuously in a reciprocating movement so that the elbow joints and the shoulders of a user will be continuously subjected to angular changes during the movement of the work surface.

2. An arrangement according to claim 1, **characterized in that** the work surface (3) is also provided to be angled at the same time away from and towards a respective user.
3. An arrangement according to any one of claims 1-2, **characterized in that** the two movements are coupled together.
4. An arrangement according to any one of the preceding claims, **characterized in that** the work surface (3) is suspended from pivotal arms (4, 5).
5. An arrangement according to claim 4, **characterized in that** the lengths of the pivotal arms (4, 5) can be varied.
6. An arrangement according to any one of the preceding claims, **characterized in that** the work surface (3) or a part of said surface can be displaced sideways for adjustment purposes and/or for motorized sideways movement.
7. An arrangement according to any one of the preceding claims, **characterized in that** the movements are program controlled.
8. An arrangement according to any one of claims 2-7, **characterized in that** the work surface (3) is successively angled away from the user during its forward movement.

Patentansprüche

1. Arbeitsplatz, insbesondere ein Arbeitsplatz, welcher mit einer Computertastatur in Beziehung steht, wobei der Arbeitsplatz eine bewegliche Arbeitsfläche (3), und einen Motor umfasst, der dafür geeignet ist, die Arbeitsfläche (3) aus einer oberen Position in eine untere Position nach unten und vorne und wieder zurück in die obere Position zu bewegen, **dadurch gekennzeichnet, dass** der Motor dafür geeignet ist, die Arbeitsfläche (3) kontinuierlich hin- und herzubewegen, derart, dass die Ellenbogengelenke und die Schultern eines Benutzers während der Bewegung der Arbeitsfläche kontinuierlich Winkelveränderungen erfahren,

2. Anordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Arbeitsfläche (3) auch dafür geeignet ist, gleichzeitig von einem entsprechenden Benutzer weg und zu diesem hin angewinkelt zu werden.
3. Anordnung nach einem der Ansprüche 1 bis 2, **dadurch gekennzeichnet, dass** die beiden Bewegungen miteinander gekoppelt sind.
4. Anordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Arbeitsfläche (3) an Schwenkarmen (4, 5) aufgehängt ist.
5. Anordnung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Längen der Schwenkarme (4, 5) variiert werden können,
6. Anordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Arbeitsfläche (3) oder ein Teil der Fläche zu Einstellungs Zwecken und/oder für eine motorisierte Seitenbewegung zur Seite versetzt werden kann,
7. Anordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Bewegungen durch ein Programm gesteuert werden.
8. Anordnung nach einem der Ansprüche 2 bis 7, **dadurch gekennzeichnet, dass** die Arbeitsfläche (3) während ihrer Vorwärtsbewegung sukzessive von dem Benutzer weg abgewinkelt wird.

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Revendications

1. Station de travail, en particulier station de travail associée à un davier d'ordinateur, ladite station de travail comprenant une surface de travail mobile (3) et un moteur qui est adapté pour déplacer la surface de travail (3) vers le bas et vers l'avant depuis une position haute jusqu'à une position basse et la ramener dans ladite position haute, **caractérisée en ce que** le moteur est adapté pour entraîner la surface de travail (3) en continu selon un mouvement alternatif de façon que les articulations des coudes et les épaules d'un utilisateur soient en permanence soumises à des modifications angulaires pendant le mouvement de la surface de travail.
2. Agencement selon la revendication 1, **caractérisé en ce que** la surface de travail (3) est également prévue pour être inclinée en même temps à l'opposé et en direction d'un utilisateur respectif.
3. Agencement selon l'une quelconque des revendications 1 et 2, **caractérisé en ce que** les deux mou-

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vements sont couplés ensemble.

4. Agencement selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la surface de travail (3) est suspendue à des bras pivotants (4, 5).
5. Agencement selon la revendication 4, **caractérisé en ce qu'il** est possible de faire varier les longueurs des bras pivotants (4, 5).
6. Agencement selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la surface de travail (3) ou une partie de ladite surface peut être déplacée latéralement pour effectuer des réglages et/ou pour un mouvement latéral motorisé.
7. Agencement selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les mouvements sont commandés par le biais d'un programme.
8. Agencement selon l'une quelconque des revendications 2 à 7, **caractérisé en ce que** la surface de travail (3) est successivement inclinée à l'opposé de l'utilisateur pendant son mouvement vers l'avant.

Fig. 1

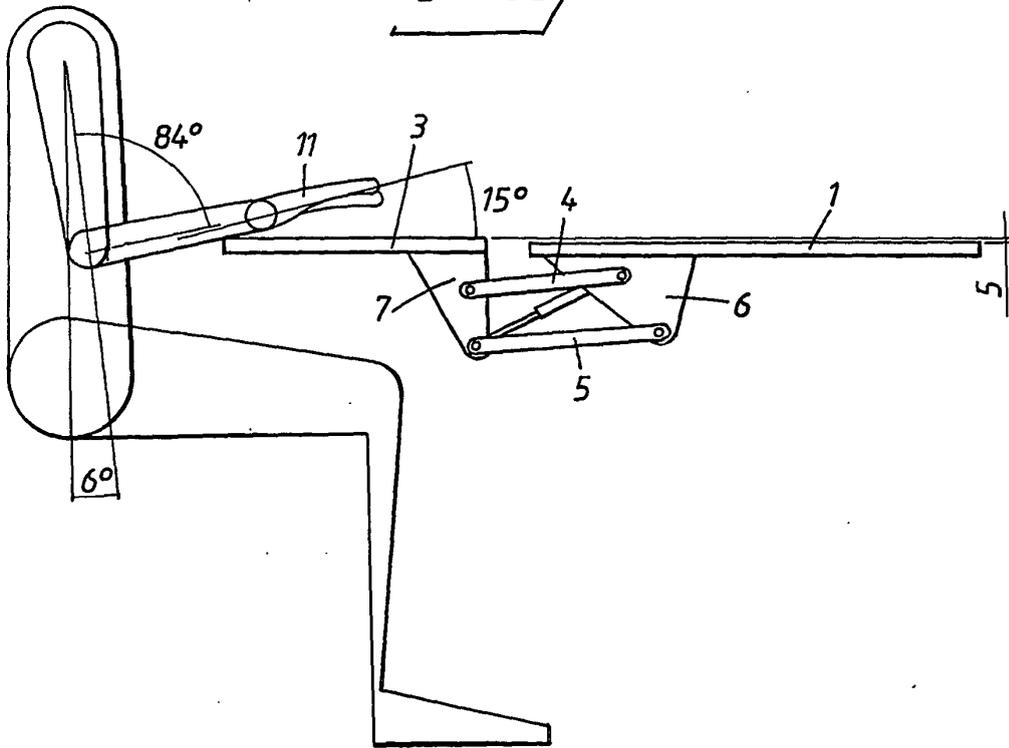
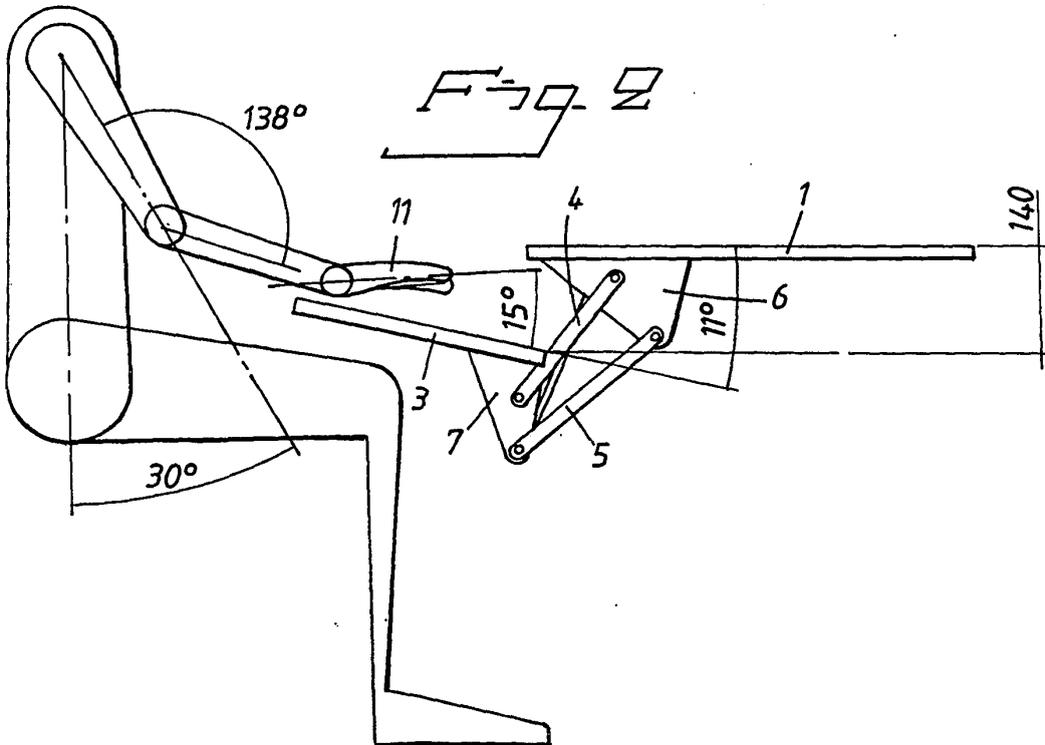


Fig. 2



REFERENCES CITED IN THE DESCRIPTION

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