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(54) **Workstation**

(57) The present invention relates to a workstation of a telematic type which may be equipped with a computer provided with components for interfacing with the user, as well as at least one motor-driven part (4, 5), where the workstation (1) is equipped with at least one

electronic apparatus (7) configured for performing at least one function chosen in the group constituted by:
- remotization in bi-directional mode of said components for interfacing with the user; and
- remote control of the motor drive of said at least one mobile part (4, 5).

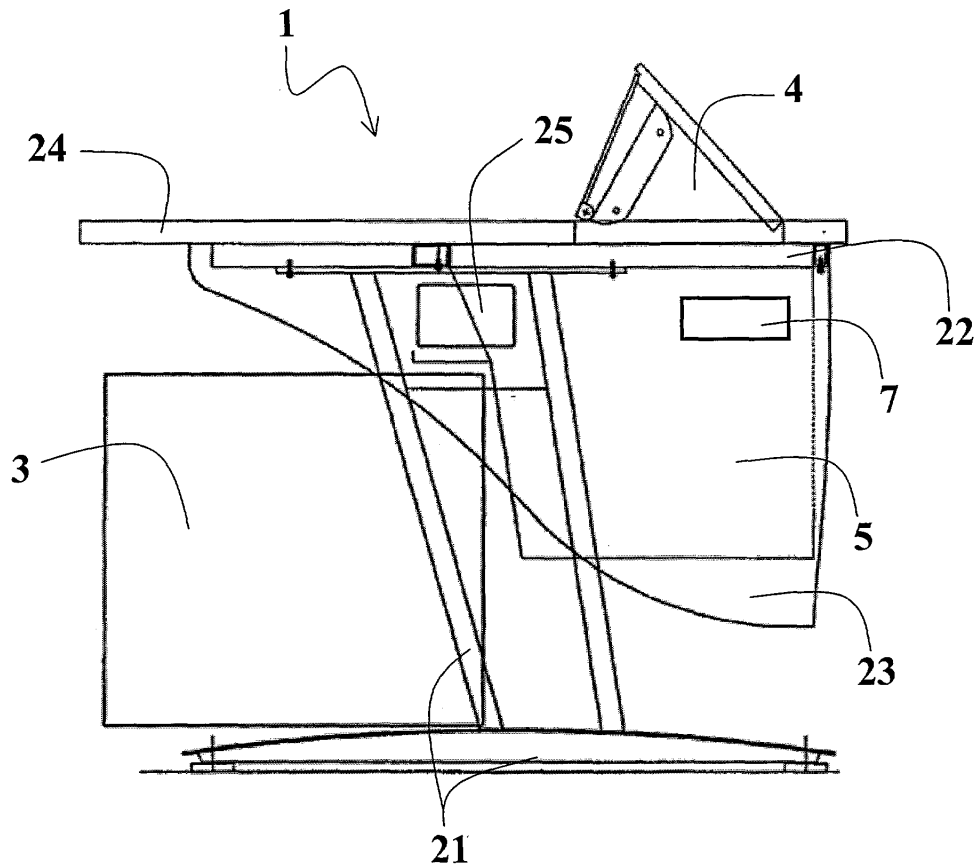


Fig. 4

Description

[0001] The present invention relates to workstations. More specifically the invention relates to workstations of a computerized type, designed to interact at a distance with one or more control stations and/or between one another, as well as to the corresponding management services.

[0002] The known art dedicated to this subject is quite extensive, as documented, purely by way of example, by US-A-4 735 467, WO-A-02/062178, US-A-2003/0062777, DE-A-102 49 623, or again IT-U-0 232 222.

[0003] The purpose of the present invention is to enable organization, start-up and management :of a network of remote computerized work points, for didactic use and other uses, constituted by purposely designed operating workstations. In particular, the purpose of the present invention is to assert, in regard to the operators, a distinctive and positive image of the computerized ergonomic workstation, not only as regards the aesthetic appearance (the so-called "look & feel") of the workstation itself but also through technologically advanced functional solutions capable of guaranteeing an efficient service of support to operators and of technical-assistance.

[0004] According to the present invention, the above purpose is achieved thanks to the solution recalled specifically in the ensuing claims, which form an integral part of the technical teaching provided herein in relation to the invention.

[0005] According to a preferred embodiment, the invention enables provision of new computerized, ergonomic, workstations, designed to interact at a distance with one or more stations for management and remote monitoring and/or with one another, connected via an Internet and/or Intranet connection network and via an integrated service of user support and technical assistance, managed via an Intranet/Internet management application.

[0006] In a particularly preferred embodiment, the ergonomic workstation according to the invention integrates within it an electronic apparatus that enables i) bi-directional remotization of the display, keyboard and mouse with the other workstations and in particular with the control station, ii) remote control via the Internet/Intranet of all the motor-driven movements of the workstation. The workstation integrates a service panel with hide-away motor-driven movement completely configurable for housing auxiliary services, as well as the devices of a PC.

[0007] The invention will now be described in detail, purely by way of non-limiting example, with reference to the annexed plate of drawings, in which:

- Figures 1 to 3 are three perspective views according to three different points of view of a workstation in accordance with the present invention;
- Figure 4 is a vertical cross section of a workstation according to the present invention;
- Figure 5 illustrates the general architecture of the system described in what follows.

[0008] In Figures 2 to 5 of the annexed drawings, the reference number 1 designates as a whole a computerized Ergonomic Learning Work Station (ELWS). The workstation 1 aims at providing a valid answer to needs of an ergonomic, functional, logistic and management type in relation to computerized workstations for didactic use, as well as other uses. In fact, the workstation 1 can be considered a valid solution for info-points, self-desks, assembly rooms, showrooms, etc.

[0009] Amongst the characteristics of the workstation 1, there is the possibility of having available the entire working surface, when the multimedia apparatus and the services installed and available therein are not being used, or else making available only the ones necessary for the planned working session. The entire workstation can be managed at a distance through the Internet/Intranet.

[0010] The workstation 1 is designed for using specialized equipment by providing dedicated connections and enables the most advanced technologies for didactic, learning and communication purposes to be incorporated therein. The workstation 1 is equipped with electronic systems for operative accommodation of the personal computer and of the devices connected thereto (monitor, keyboard, mouse, webcam, earphones/microphone, joystick, etc.), in addition to motor-driven mechanisms for enabling movements of hiding-away and recovery of the various apparatus (monitor, keyboard/mouse, etc.).

[0011] The electronic components, the motor-driven mechanisms, the wiring and whatever else is envisaged for the workstation 1 are housed in the container modules located in the front part underneath the working surface. The monitor and user-interface panels are housed, instead, in hide-away re-closeable container compartments.

[0012] The above characteristics of flexibility render the workstation perfectly adaptable to any type of didactic requirement, whether "traditional" classroom, advanced multimedia classroom, or electronic learning (e-learning) workstation.

[0013] The workstation 1 enables numerous possibilities of combination of equipment in order to meet the various requirements for setting up spaces dedicated to teaching and learning. In addition, thanks to accessory elements of the "mobile partition" type, it is possible to create "integrated working units", each delimited and delineated according to the specific needs of the individual and of the type of activity, even in environments of large dimensions where a number of operators are all working together.

[0014] All the parts of the workstation 1 meet legal standards in terms of environmental safety, and non-toxicity of the

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materials employed. The workstation 1 is an ergonomic product meeting the standard 626. The solid, sturdy and stable structure ensures that the work place reaches the maximum levels of UNI Tests. The colours and opacity of the non-reflecting surfaces are purposely studied for use in workstations for video terminals.

5 **[0015]** In the embodiment illustrated in Figure 1, the workstation 1 is made up of the following modules: a base module 2 substantially resembling a table or writing-desk; a container module 3 for housing the computer; a container module 4 for housing the monitor; a container module 5 for the service/device panel; a container module 6 for housing the mouse/keyboard; and an electronic control module 7 (Electronic Slave Control System or ESCS).

10 **[0016]** The base module 2 is provided with supporting legs 21 made of extruded aluminium, with adjustable feet for levelling on the floor, said legs being made up of two elements, one of which is mobile and enables the wiring to be run through it from the top to the base. A connecting cross member 25 constitutes, together with the supporting frame 22 and the legs, the load-bearing skeleton of the entire module. The cross member 25 enables passage of any type of cable (audio, video, data, electrical, etc.). The supporting frame 22, in addition to performing the fundamental role of providing stability of the desk, is designed to support and house all the optional modules of the desk itself.

15 **[0017]** The various container modules 3 to 6 for the electronic equipment and motor-driven mechanisms enable housing of the electronic components, wiring, etc.

[0018] The side panels 23 provide an appropriate finish and shape for the load-bearing skeleton.

[0019] In addition to providing an appropriate effect of finish, a front panel located underneath the working surface enables ease of access to any electronic equipment that can be installed inside the desk.

20 **[0020]** Preferably, the working surface 24 is made of veneered or overlaid chipboard material made up, for example, of particles of wood having adequate mechanical resistance (class E1), coated with decorative papers impregnated with melaminic resins. The specific production processing renders the working surface impermeable to stains and resistant to abrasion and wear.

25 **[0021]** Made in the lower part of the working surface 24, by means of multiple milling operations at different heights, is a series of compartments that have the function of providing housings for the devices of the optional container modules 4 for the monitor, the actuating switches, the container module 5 for the service/device panel, and the container module 6 for housing the mouse/keyboard.

[0022] All the metal parts of the base module 2 are painted with epoxy powder paint in automatic plants with a cycle of two hours and baking at 180°C; the coating obtained renders the surface resistant to ageing and of a hardness comparable to scratch-resistant surfaces.

30 **[0023]** The container module 3 for housing the computer, located underneath the working surface 24, enables safe housing of the computer case. Said module has a metal structure and has been designed for being integrated harmoniously with the module 2; the module 3 is provided with a lock to protect access to the critical areas of the PC. Like all the metal parts, also this module is painted with epoxy powder paint in automatic plants with a cycle of two hours and baking at 180°C; the coating obtained renders the surface resistant to ageing and of a hardness comparable to scratch-resistant surfaces.

35 **[0024]** The container module 4 for the monitor enables hide-away housing of a 15" LCD monitor of the PC. Said module, fixed on the supporting frame 22, is constituted by a supporting frame made of metal. Like all the metal parts, also this module is painted with epoxy powder paint in automatic plants with a cycle of two hours and baking at 180°C; the coating obtained renders the surface resistant to ageing and of a hardness comparable to scratch-resistant surfaces.

40 **[0025]** The mechanism of movement of the monitor occurs in a completely automatic way by means of a control device that can be managed either locally or remotely. Operation of the device is guaranteed by the presence of a 220-Vac or 24-Vdc actuator with motor mounted in line, transmission via trapezoidal acme-type screw, stem made of aluminium complete with integrated end-of-travel elements, and body made of aluminium.

45 **[0026]** The control electronics of the device is constituted by a circuit, which, via two soft-touch push-buttons (up and down), actuates the motor to enable the container module 4 housing the monitor to pass from the "all-closed" position, with the monitor hidden away in the appropriate compartment, to the "all-open" position with the monitor in view on the working surface. The device is equipped with a safety system that guarantees execution of the operation of opening and closing of the monitor without any danger for the operator.

50 **[0027]** The service/device-panel container module 5 enables hiding away of the service panel of the workstation 1. The module 5, fixed on the supporting frame 22 of the desk by means of three hide-away hinges made from the working surface 24 by means of three-dimensional milling, is constituted by a metal supporting frame. Like all the metal parts, also this module is painted with epoxy powder paint in automatic plants with a cycle of two hours and baking at 180°C; the coating obtained renders the surface resistant to ageing and of a hardness comparable to scratch-resistant surfaces.

55 **[0028]** Also moving of the module 5 occurs in a completely automatic way via a control device that can be managed either locally or remotely. The operation of the device is guaranteed by the presence of a 220-Vac or 24-Vdc actuator, with motor mounted in line, transmission via trapezoidal acme-type screw, stem made of aluminium complete with integrated end-of-travel elements, and body made of aluminium.

[0029] Also in this case the control electronics of the device is constituted by a circuit, which, via two soft-touch push-

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buttons (up and down), actuates the motor for enabling the module to assume the "all-open" position or the "all-closed" position.

[0030] The device is equipped with a safety system that guarantees execution of the operation of opening and closing of the service panel, without any danger for the operator.

5 **[0031]** The configuration of the service panel - not illustrated in detail in the drawings - is such as to meet the needs of a normal user: auxiliary video input, auxiliary video output, auxiliary VGA input, auxiliary VGA output, auxiliary audio input, auxiliary audio output, auxiliary LAN connection, 220-Vac supply, pre-arrangement for housing webcam, pre-arrangement for housing earphones with microphone, two USB connections to the PC installed in the desk, one parallel connection to the PC installed in the desk, and one serial connection to the PC installed in the desk.

10 **[0032]** The container module 6 housing the mouse/keyboard has a metal structure and enables manual hiding away of the mouse and keyboard of the PC. Like all the metal parts, also this module is painted with epoxy powder paint in automatic plants with a cycle of two hours and baking at 180°C; the coating obtained renders the surface resistant to ageing and of a hardness comparable to scratch-resistant surfaces. The presence of a door hinged on the surface of the desk, designed for being integrated in a harmonious way with the rest of the desk, enables easy access to the equipment.

15 **[0033]** The electronic-control module 7 (Electronic Slave Control System - ESCS) governed by the control and management workstation (ELWS Control System) enables interaction and remote on/off control of the audio, video and computer peripherals installed in the workstations 1 connected thereto, in addition to the motor-driven devices with which the workstations are equipped.

20 **[0034]** The workstation 1 of a telematic type is equipped with a computer provided with components for interfacing with the user, such as, for example, display, keyboard, mouse, webcam, earphones, microphone, and joystick, as well as at least one motor-driven part 4, 5. The workstation 1 is moreover equipped with at least one electronic apparatus 7 configured for performing at least one function chosen in the group constituted by:

- 25 - remotization in bi-directional mode of said components for interfacing with the user; and
 - remote control of the motor drive of said at least one mobile part 4, 5.

[0035] Appearing in Table 1 below are the functions supported, as well as the technical characteristics of the electronic-control module 7.

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Table 1

	CHARACTERISTICS
35 40 45	Management of VGA video interchange Management of keyboard interchange Management of mouse interchange Management of audio intermix Management of RS232 Local Control Management of motor-driven devices "Mute" function "Help-Desk Call" function "Video" function Video-blanking function Digital volume-adjustment function RS232 - RS485 conversion port Self-diagnosis of the system

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(continued)

CHARACTERISTICS							
5 10 15 20 25 30	<p>Technical characteristics</p> <p>Number of video channels: 2 VGA In - 2 VGA Out In/out video bus</p> <p>Number of audio channels: 4 Number of channels audio mike + stereo earphones: 2</p> <p>Number of PS2 keyboard control channels: 2 Number of PS2 mouse control channels: 2 In/out keyboard/mouse bus In/out RS485 control bus</p> <p>Number of bus channels for "black panel": 4 Number of "PIC" program ports: 2 Number of RS232 local controls: 1 Microphone input: 2 kΩ Stereo earphones output: 32 Ω 250 mW Number of stereo auxiliary audio inputs: 2 Stereo auxiliary audio input: 10 kΩ Number of auxiliary audio outputs: 2 Auxiliary audio output: 600 Q Microprocessor digital technology Supply voltage: 220-240V 50-60 Hz</p> <p>Dimensions</p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: right;">Height:</td> <td style="text-align: right;">55 mm</td> </tr> <tr> <td style="text-align: right;">Depth:</td> <td style="text-align: right;">107.5 mm</td> </tr> <tr> <td style="text-align: right;">Length:</td> <td style="text-align: right;">350 mm</td> </tr> </table>	Height:	55 mm	Depth:	107.5 mm	Length:	350 mm
Height:	55 mm						
Depth:	107.5 mm						
Length:	350 mm						

[0036] Engineering of the system enables modular development of the basic system.

[0037] Figure 5 is a schematic illustration of a hypothetical architecture of the system as a whole, which envisages the presence of various workstations designated by ELWS1, ..., ELWS5 (the number can be any whatsoever, even of the order of hundreds), together with one or more control units C (two, in the example illustrated) connected to the stations ELWS1, ..., ELWS5 and between one another via a connection network 30 of the Internet or Intranet type so as to be able to perform the function of remotization that lies at the basis of the solution described herein.

[0038] The management software in a Master/Slave mode, designed to provide logistic support to the operating activities of the workstation, enables remote management of the motor-driven movements of the workstation and of the available devices, management of support to the user and of the Logs, as well as diagnostic analyses of the system and of the individual workstations.

[0039] Of course, the details of construction and the embodiments may vary widely with respect to what is described and illustrated herein, without thereby departing from the sphere of protection of the present invention, as defined by the annexed claims.

Claims

1. A workstation of a telematic type which may be equipped with a computer provided with components for interfacing with the user, as well as at least one motor-driven part (4, 5), the workstation (1) being equipped with at least one electronic apparatus (7) configured for performing at least one function chosen in the group constituted by:

- remotization in bi-directional mode of said components for interfacing with the user; and
- remote control of the motor drive of said at least one mobile part (4, 5).

2. The workstation according to Claim 1, **characterized in that** said components of interaction are chosen in the group constituted by: display, keyboard, mouse, webcam, earphones, microphone, and joystick.

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3. The workstation according to Claim 1, **characterized in that** said electronic apparatus (7) is configured for enabling remote control of the motor drive of said at least one motor-driven part (4, 5) via the Internet/Intranet.
- 5 4. The workstation according to any one of the preceding claims, **characterized in that** it comprises a container module (5) with motor-driven movement for housing components that are auxiliary with respect to the components of said computer.
- 10 5. The workstation according to any one of the preceding claims, **characterized in that** it comprises a base module (2) substantially resembling a table or writing-desk.
- 15 6. The workstation according to any one of the preceding claims, **characterized in that** said at least one motor-driven part (4) is a container for the screen associated to said computer.
- 20 7. The workstation according to Claim 6, **characterized in that** said container for the screen of said computer (4) is mobile between a closed position, in which the display of the computer associated thereto is hidden away, and an open position, in which said display is in an exposed working position for said workstation.
- 25 8. The workstation according to any one of the preceding claims, **characterized in that** said container module (5) is a container for a service/device panel associated to said computer.
- 30 9. The workstation according to Claim 8, **characterized in that** said at least one container for said service/device panel (5) is mobile between a closed position, in which the service/device panel of the computer associated thereto is hidden away, and an open position, in which said service/device panel is in an exposed working position for said workstation.
- 35 10. The workstation according to any one of the preceding claims, **characterized in that** it comprises a service panel configured for performing functions chosen in the group constituted by:
- auxiliary video input;
 - auxiliary video output;
 - auxiliary VGA input;
 - auxiliary VGA output;
 - auxiliary audio input;
 - auxiliary audio output;
 - auxiliary LAN connection;
 - 220-Vac supply;
 - pre-arrangement for housing webcam;
 - pre-arrangement for housing earphones;
 - pre-arrangement for housing microphone;
 - USB connection to said computer;
 - parallel connection to said computer; and
 - serial connection to said computer.
- 40 11. The workstation according to any one of the preceding claims, **characterized in that** said at least one electronic apparatus (7) is configured for supporting functions chosen in the group constituted by:
- management of VGA video interchange;
 - management of keyboard interchange;
 - management of mouse interchange;
 - management of audio mixing;
 - management of RS232 local control;
 - management of motor-driven devices;
 - mute function;
 - helpdesk-call function;
 - video function;
 - video-blanking function;
 - volume-adjustment function;
 - RS232-to-RS485-conversion port;
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- self-diagnosis of the system.

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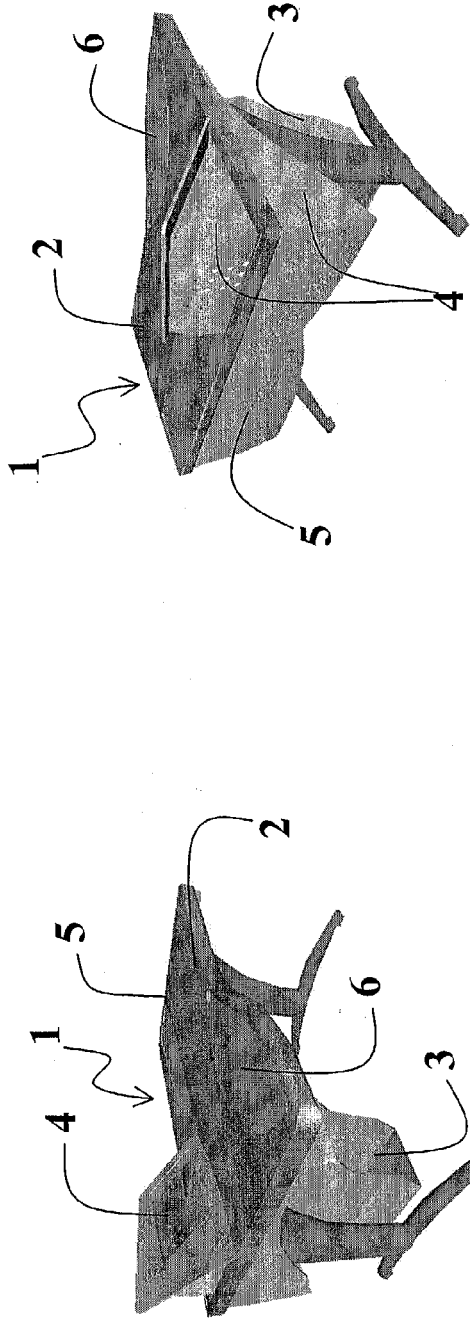


Fig. 1

Fig. 2

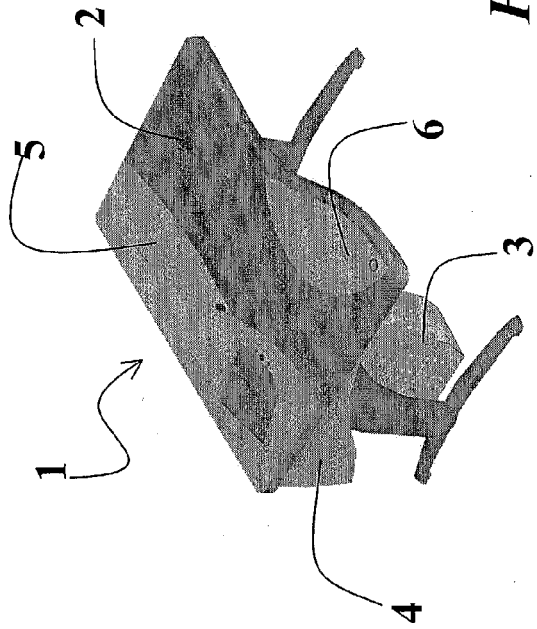


Fig. 3

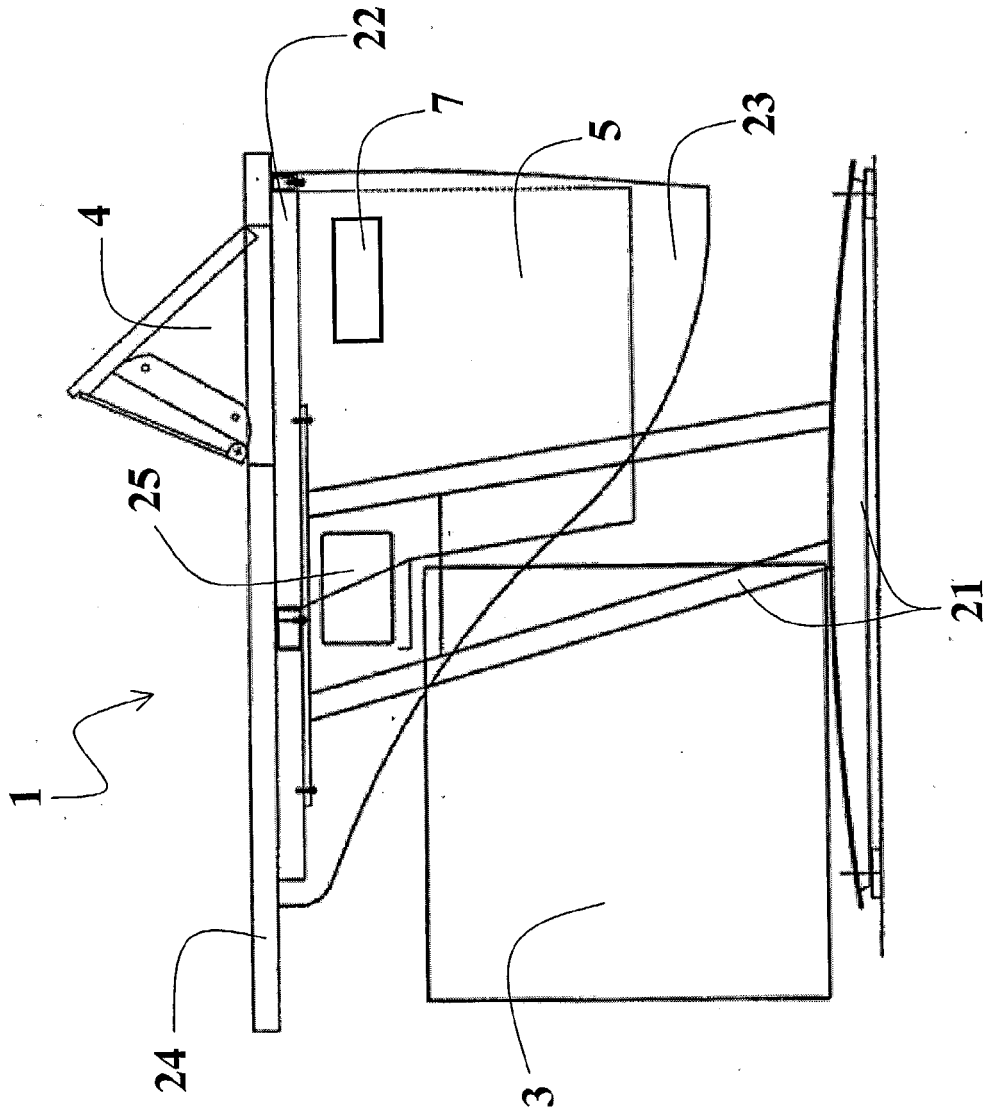


Fig. 4

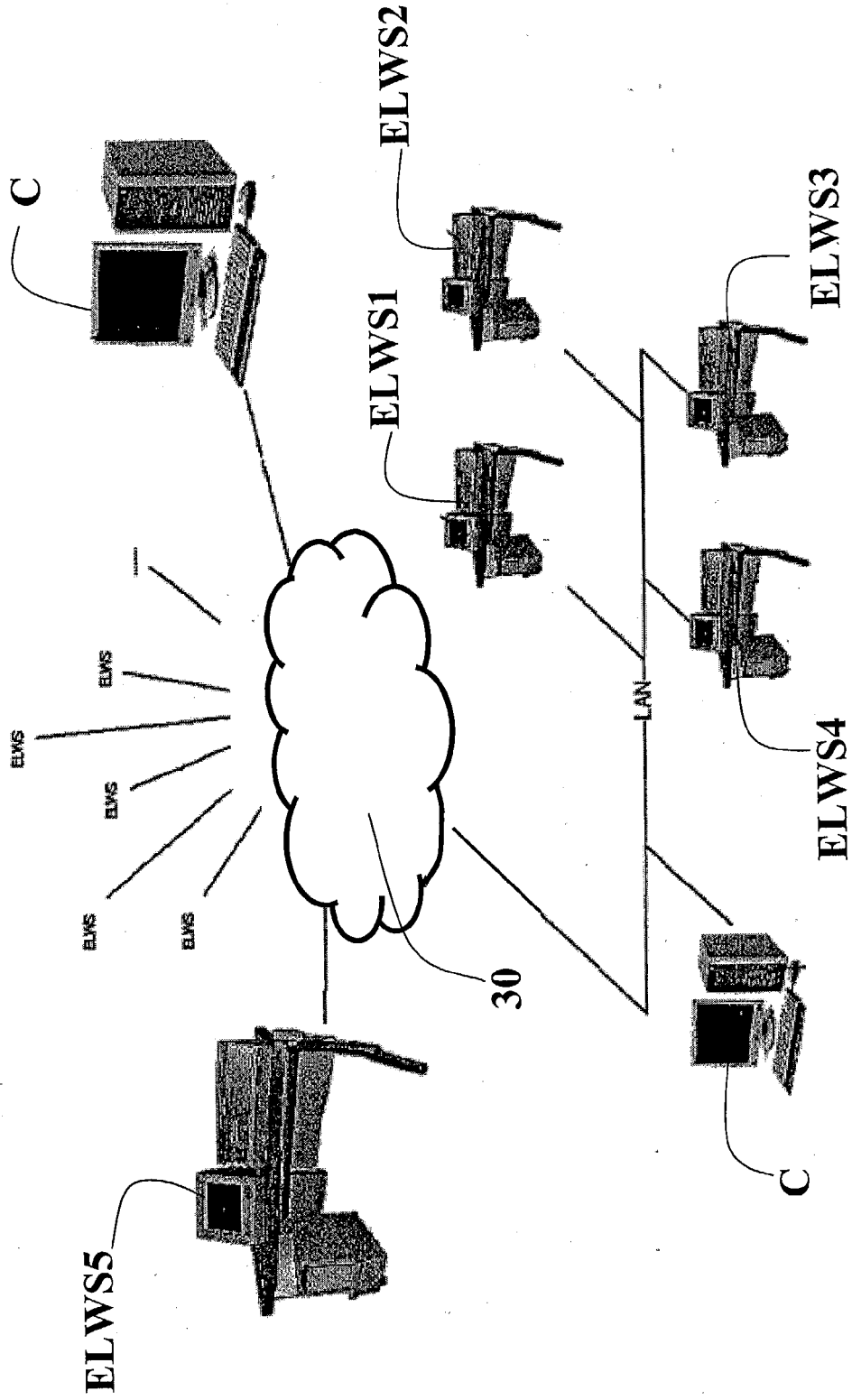


Fig. 5



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 03/079850 A (BEN JANS ELECTRONICS NV/SA; JANS, BEN) 2 October 2003 (2003-10-02) * page 9, line 4 - page 12, line 4 * * claim 14 * * figures * -----	1-11	A47B21/00
X	WO 00/21408 A (PETTERSSON, CURT) 20 April 2000 (2000-04-20) * page 8, line 20 - line 30 * * page 9, line 20 - page 10, line 5 * * figures * -----	1-3,5, 10,11	
X	EP 0 999 533 A (LINAK A/S) 10 May 2000 (2000-05-10) * paragraphs [0047], [0048] * * figures 8-8b * -----	1,2,5	
A	EP 0 814 393 A (TELIA AB) 29 December 1997 (1997-12-29) * abstract; figure 1 * -----	1,3	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	DE 295 17 355 U1 (BIEBER, GERALD, DIPL.-ING., 65760 ESCHBORN, DE) 14 March 1996 (1996-03-14) * the whole document * -----	1,3	A47B H04L
A	US 6 138 150 A (NICHOLS ET AL) 24 October 2000 (2000-10-24) * abstract * -----	1,3	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 31 October 2005	Examiner van Hoogstraten, S
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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31-10-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 03079850	A	02-10-2003	AU 2003227542 A1	08-10-2003
WO 0021408	A	20-04-2000	SE 9803479 A	14-04-2000
EP 0999533	A	10-05-2000	JP 2000165969 A	16-06-2000
			US 6570491 B1	27-05-2003
EP 0814393	A	29-12-1997	DE 69714658 D1	19-09-2002
			DE 69714658 T2	10-04-2003
			DK 814393 T3	02-12-2002
			NO 972653 A	22-12-1997
			SE 521508 C2	04-11-2003
			SE 9602505 A	21-12-1997
DE 29517355	U1	14-03-1996	NONE	
US 6138150	A	24-10-2000	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4735467 A [0002]
- WO 02062178 A [0002]
- US 20030062777 A [0002]
- DE 10249623 A [0002]
- IT 0232222 U [0002]