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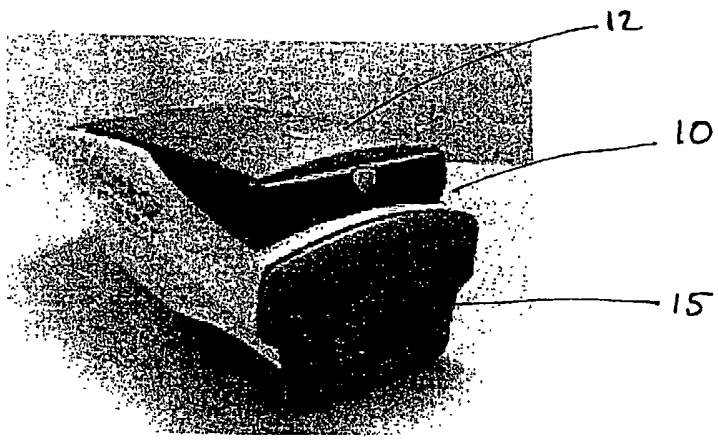
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MEASUREMENT DEVICE



(57) Abstract: A hand held measuring device (10) which includes a base component (11) having sensing means including a laser aperture (15) adapted to measure parameters such as distance, and to cooperate with a computing component (12) such that measurements are analysed using software stored on the computing component said software being specific to a particular application.

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MEASUREMENT DEVICE

Technical Area

This invention relates to the area of measurement generally and in particular to the measurement of areas or volumes and the provision of calculation means to be used in association with such measurements as well as means for the transmission of related information to remote sites.

Background to the Invention

There are many instances where tradespeople and others need to measure distances, areas or volumes in order to estimate the amount of equipment necessary to carry out a particular job.

For instance painting contractors have traditionally measured wall areas by tape measure or ruler or the like or have simply estimated a given area by eye. These measurements are subsequently used to determine the amount of paint required for a particular job.

This type of approach is time consuming and can be inaccurate and, although there are measurement devices which use ranging sensors which are sonic or laser based, there is still a requirement for the requisite calculations to be carried out separately.

Outline of the Invention

It is an object of this invention to provide a hand-held device which can be used to accurately measure dimensions and use these to calculate other parameters of interest such as may be required for a specific application.

The invention is a hand held measuring device which includes a body component having sensing means adapted to measure parameters, such as distances, and to cooperate with a computing component such that measurements made are analysed using software stored on the computing component said software being specific to a particular application.

It is preferred that the measuring device have the capacity to transmit measured and calculated data to a site remote from the measurement site.

It is preferred that the body member include a base component incorporating range sensing means and that the base component be adapted to engage with a separate computing component.

It is preferred that the sensing means used be a laser or other such remote sensing means however any appropriate range measuring means may be used.

It is further preferred that the measuring device be able to be programmed to calculate any information required such as materials required to carry out a task, associated

costs thereof and estimated profit associated with the task. It may be preferred that the device have software which includes look up tables.

It may also be preferred that the device of the invention be able to transmit the results of any calculations to some destination such as a remote printer or computer by means of wireless or other transmission means.

It may further be preferred that the device of the invention be either unitary or consist of separate engageable range sensing components and computing components.

In order that the invention may be more readily understood we shall describe by way of non limiting example a specific embodiment thereof with reference to the accompanying drawings.

Fig. 1 Is a perspective view of an embodiment of the invention used as a measurement tool and showing one end thereof;

Fig. 2 Is a perspective view of the invention shown in Figure 1 showing its opposing end;

Fig. 3 Shows the upper surface of the invention with the computer component lid raised;

While the concept of the invention has many applications, for convenience sake it will be discussed here in terms of its application to the painting industry.

In the embodiment of the invention shown in Figures 1-3 the measurement device or tool 10 has two main components. One of these is a base or docking station 11, which is designed to be easily hand held, and into and over which a second component 12 is designed to engage. The base 11 has an aperture 15 through which a laser beam, or other type of sensor, can pass to effect the measuring. In addition it has on/off buttons 16 and 17 mounted at the upper rear of the docking station.

The second component 12 is a programmable computer device which can process measurements made by the laser measuring device in the station 11 these measurements being made in accordance with its software with recourse to custom designed look up tables.

This docking station 11 for the software device can act as a telecommunications device and transmit information to a preselected remote site such as a printer or computer or other such device.

In the area of contract painting a user can hold the device against the walls and easily obtain the dimensions of the areas which require painting. A look up table in the calculator then provides information concerning the amount of paint which will be required as well as associated costs and estimated profits. The device can also be provided with a sensor such as a spectrophotometer which can determine an existing colour and match it to known colour paints which are manufactured.

An example of an application of the use of the invention to painting contracting is described here. Figure 3 shows the computer device 12 with an open lid 13 displaying a screen 14. The computer device shown is hand held and uses a touch screen and as such has no keyboard provided it is only necessary to touch the screen with a stylus to execute the particular function required.

The measuring tool 10 is a high tech laser-measuring device that will measure distances of up to 30m with an accuracy of +-1.5mm and is mounted inside the docking station or body component. The invention therefore provides a small, easy-to-use hand-held laser distance meter that accurately measures distance, area and volumes with simple single key operations.

The computation required is provided by estimator software which allows the painter to provide fast and accurate quotes to customers. The estimator software is actuated typically by menu driven activity function buttons all of which contribute to the ability of a user or contractor to measure up an area and prepare quotations for clients.

Before commencing quoting the software must first be customised so that it understands how a user works in their business. To do this there is provided a contractor options screen. This tells the software how much to charge for labour, what type of paints, surfaces and substrates to use, finishes etc. This is the heart of the software and the accuracy of this information will directly affect the accuracy of the quotes and the information that the measurement device will calculate.

This section also retains the profiles of the various people that will be using the tool each with their individual customised settings. This section will allow a user to enter as many contractor profiles as necessary.

The software has a series of menus which a user operates in sequence to measure and quote for a building preferably on a room by room basis. One screen relates to the measuring of rooms and has features such as room shape, length, width and height and such like.

All that is required is that the user place the measurement device against a wall to measure the length and press the appropriate spot on the screen. The device then automatically activates the laser and an entry into the computer device is made for the length. The other parameters which are measured are entered in a similar fashion. The software also provides a series of menus for measuring more complicated room shapes and parts of rooms.

After measurements are completed and stored a menu of colours can be accessed and selections can be made.

Where the device is used in relation to painting, either by contractors or others, it permits the measurement and calculation of areas or volumes and allows the associated costs of labour and materials to be estimated accurately. It also can include the calculation of marked up profit for performing work and enables the print out of results either to a printer or a computer by means of wireless telephone.

The software will also be effective where measurements are put into it manually and not while the measurement process is occurring. Similarly the device can be used as a measurement device solely.

The concept of the invention includes both sensing means and calculation means with further transmission means although information can be stored in the device for later downloading and analysis if desired.

The invention has many applications and it is envisaged that with the provision of different software for each specific application that the concept of the invention could be applied to such diverse areas as estimating fencing requirements, airconditioning, carpentry, roofing, shelving, tiling, building and even be used for making on site insurance evaluations where the device of the invention was provided with a camera device.

Whilst we have described herein several specific embodiments of the invention it is envisaged that other embodiments of the invention will exhibit any number of and any combination of the features previously described and it is to be understood that variations and modifications in this can be made without departing from the spirit and scope of the invention.

The claims defining the invention are as follows:

1. A hand held measuring device which includes a body component having sensing means adapted to measure distances and to cooperate with a computing component such that measurements made are analysed using software stored in the computing component said software being specific to a particular application.

2. A measuring device as claimed in claim 1 having means to transmit measured and calculated data to a site remote from a measurement site.

3. A measuring device as claimed in claim 2 wherein the transmission means is radio transmission.

4. A measuring device as claimed in claim 1 or claim 2 wherein the body member includes a base component incorporating the distance sensing means said base component being adapted to engage with a separate computing component.

5. A measuring device as claimed in claim 4 wherein the distance sensing means is a laser device.

6. A measuring device as claimed in claim 4 or claim 5 wherein the software can use measurements made with the device in association with customised look up tables to prepare quotations for a job as required by a user.

7. A measurement device as claimed in claim 6 wherein a user prepares the customised look up tables in response to menu prompts from the software.

8. A measurement device as claimed in claim 7 having software to calculate quantities of materials required to carry out a task, associated costs thereof and estimated profit associated with the task

9. A measurement device as claimed in claim 7 or claim 8 wherein distances are measured by the sensing means in the device automatically when a user responds to relevant menu prompts given by the software.

10. A measurement device as claimed in any one of claims 1 to 9 wherein the device is used in relation to the painting industry.

11. A measurement device as claimed in claim 10 wherein the software includes a menu of colours from which colour selections can be made.

12. A measurement device substantially as herein described with reference to the accompanying drawings.

DATED THIS 5th DAY OF OCTOBER 2002

Autech Research Pty. Limited
By its Patent Attorneys
A. TATLOCK & ASSOCIATES

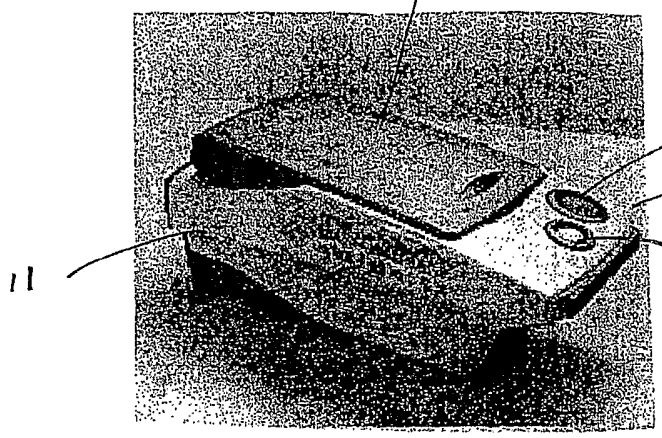

Fig. 1

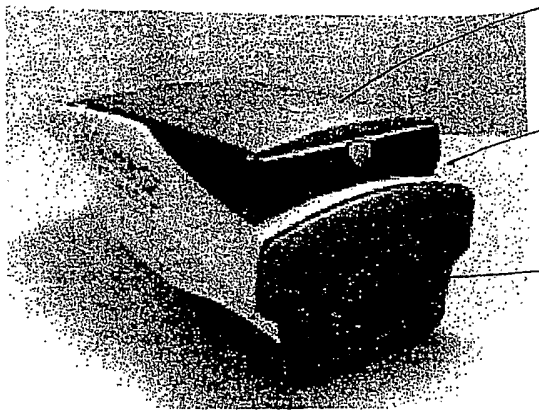

Fig. 2.

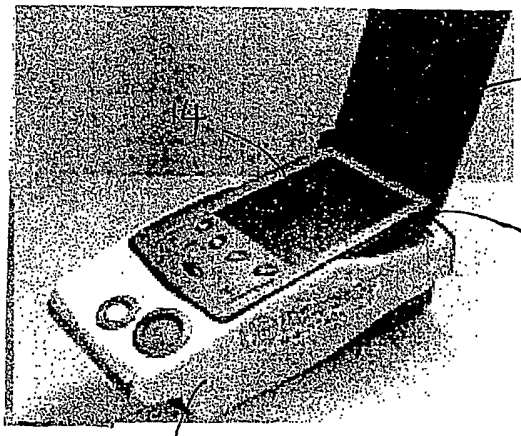

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU02/01342

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: G01C 3/00, G01S 17/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI, JAPIO - keywords: ("hand held" or portable or mini) and (meas+ or read+ or meter+) and (distan+ or length or area or dimens+) and (comput+ or calc+ or software or pc) and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, Y	5 949 529 A (DUNNE et al.) 7 September 1999 See in particular col 5 line 5 - col 6 line 20, and figures 1-3	1-7, 8-12
X, Y	5 806 020 A (ZYKAN) 8 September 1998 See in particular col 6 line 35 - col 8 line 5	1-7, 8-12
X	EP 137 612 B (THE RICHMAN BROTHERS COMPANY) 5 April 1984 See in particular col 5 line 1 - col 7 line 55, and figure 1	1-9, 12

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* 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 application or patent 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 when the document is taken alone
"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

Date of the actual completion of the international search	Date of mailing of the international search report
24 December 2002	- 3 JAN 2003
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer **LARS KOCH** Telephone No : (02) 6283 2551

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU02/01342

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, Y	WO 90/12330 A (MEASUREMENT DEVICES LIMITED) 18 October 1990 See in particular page 3 line 35 - page 5 line 35 and page 7 line 22 - page 7 line 38	1-5, 6-12
X,Y	www.hitechtech.com (© 14 December 2000) See in particular "laser" then "hand held"	1-7, 8-12
X, Y	www.disto.com (© 7 April 2000) See in particular "Products" and "Downloads"	1- 12
	Please note: all of the above citations having a "Y" classification are considered to render the second group of claims list as lacking an inventive step when combined with the "Y" classified document listed below.	
Y	www.expertestimator.com (© - last updated 20 November 1999) See in particular "Estimating Software for Painting Contractors"	6-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU02/01342

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	5949529	AU	89014/98	CA	2303843	US	5859693
		WO	9910709				
US	5806020	US	5696705	AU	71288/98	EP	975988
		WO	9847018				
EP	137612	CA	1267280	EP	227642	JP	60134004
		US	4586150	CA	1224535	US	4598376
WO	9012330	AU	54254/90	CA	2051656	EP	466789

END OF ANNEX