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G4A  
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G06F

(54) Machine editing of free-hand work

(57) An apparatus for performing a free-hand work transformation into a machine edited form comprises a position-sensing membrane 12, a display panel 14, a module 16 including a control unit 18 connected to an output device or devices, and a stylus 29 extending from the module 16. Free-hand work being performed by the stylus, 29 on the position-sensing membrane 12 generates a signal which is transmitted to the control unit 18 and thence to the display panel 14 for displaying the free hand work. The control unit 18 then processes the generated signal whereby the relayed generated signal from the control unit 18 to the display panel 14 is transformed to a processed signal for displaying the machine edited form.

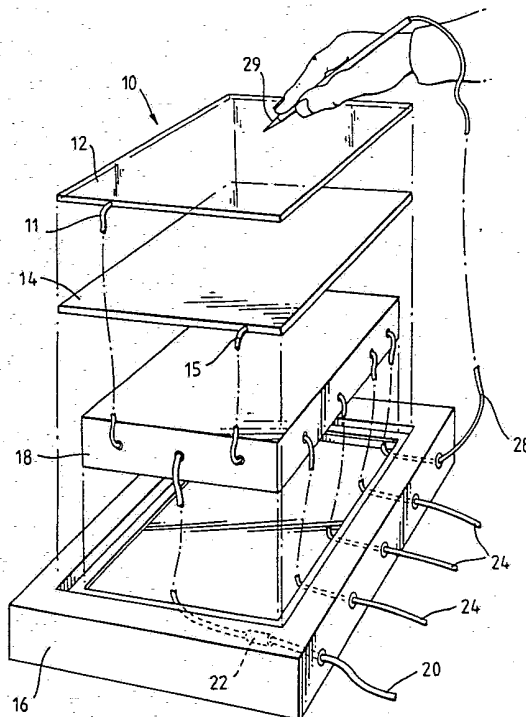


Fig.1.

The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.

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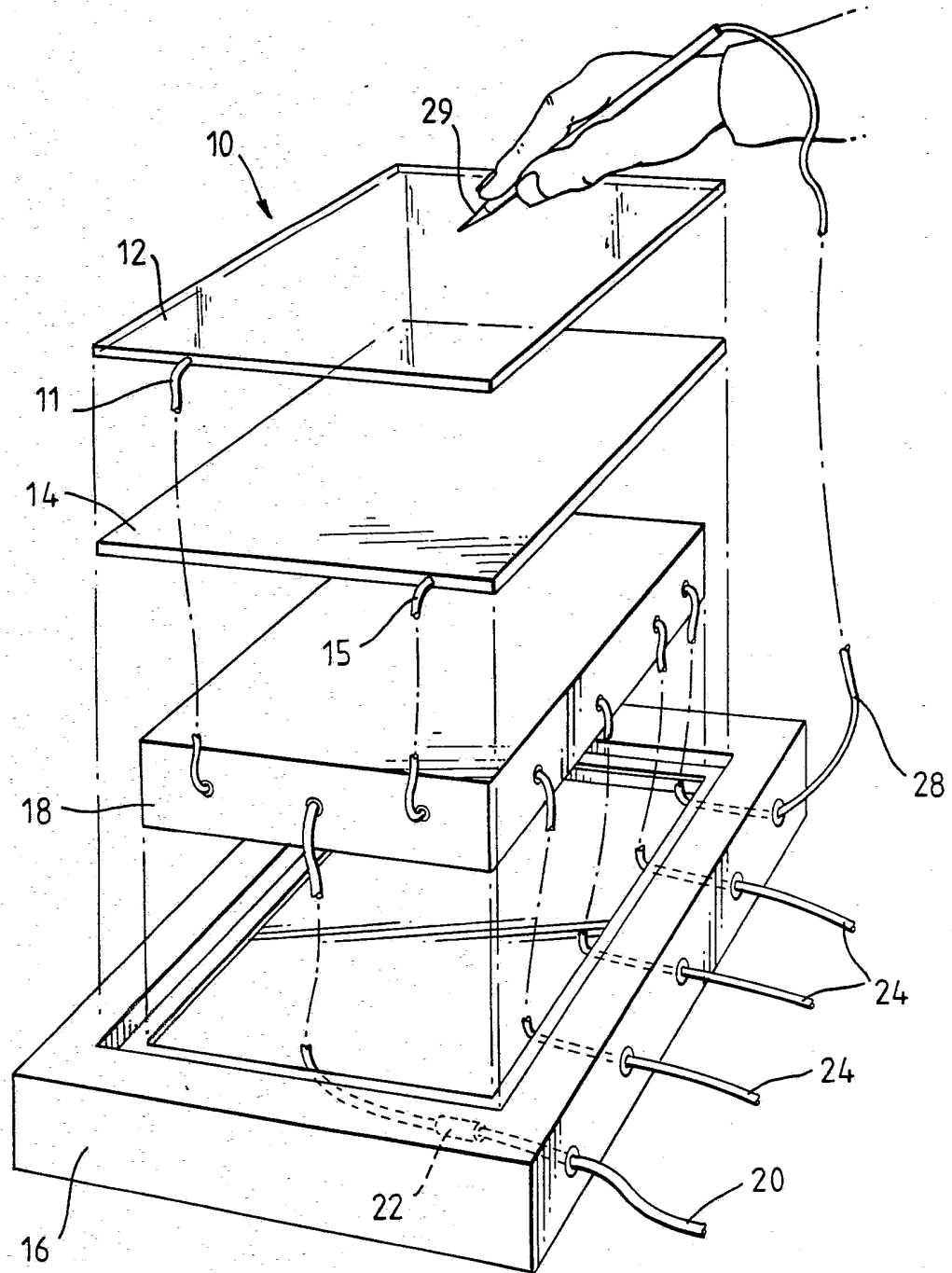


Fig. 1.

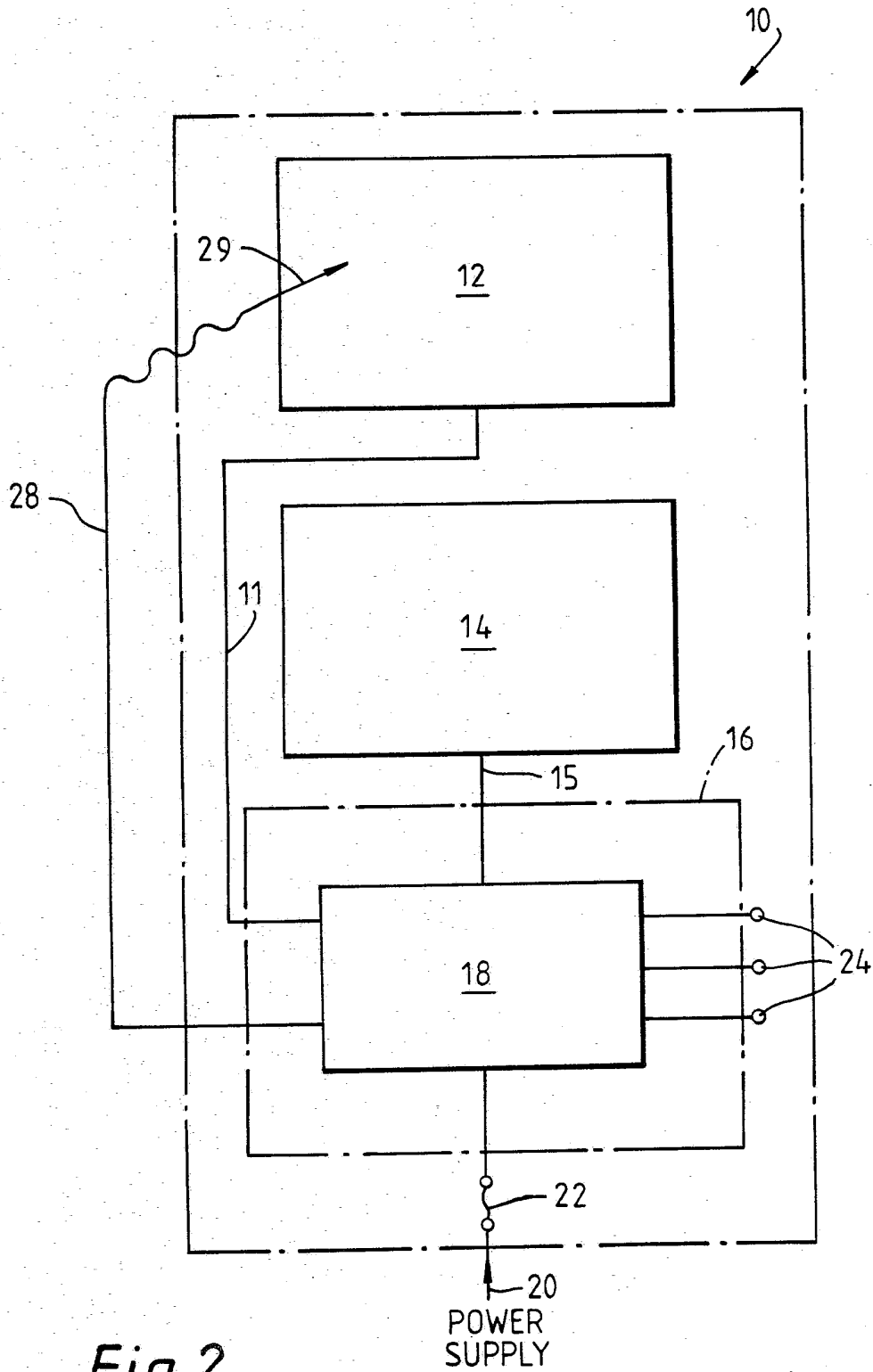


Fig. 2.

Fig. 3.

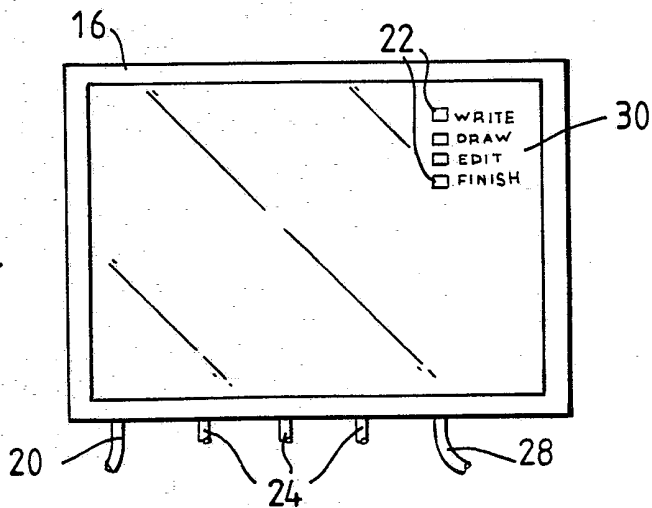


Fig. 4.

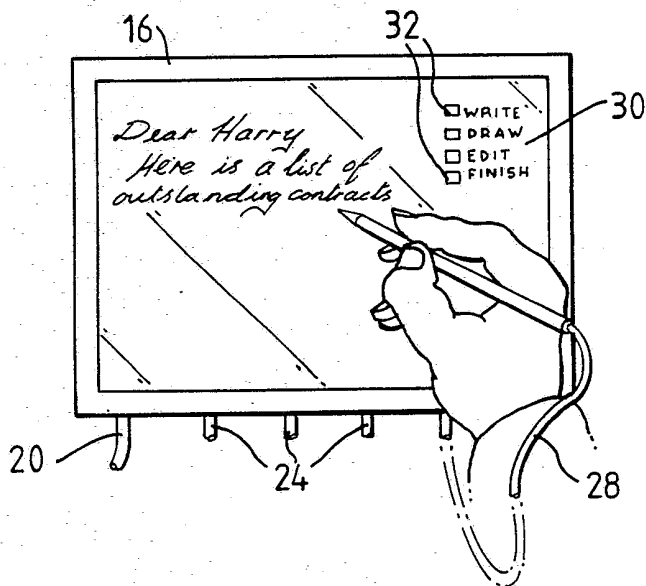


Fig. 5.

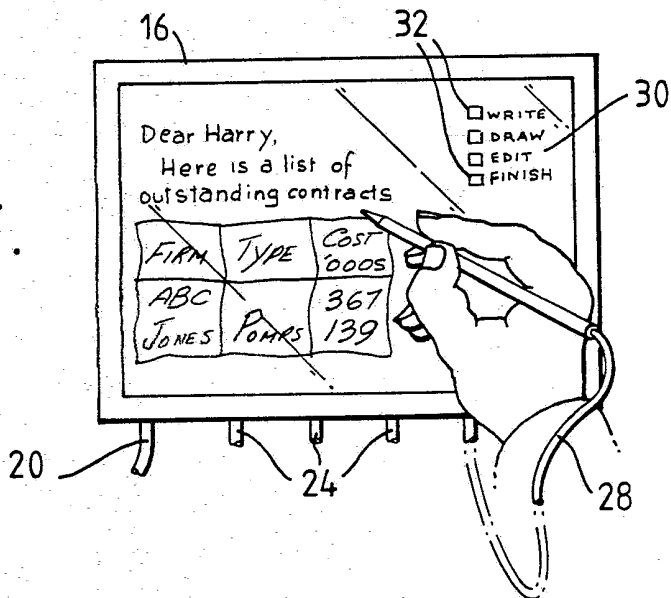


Fig. 6.

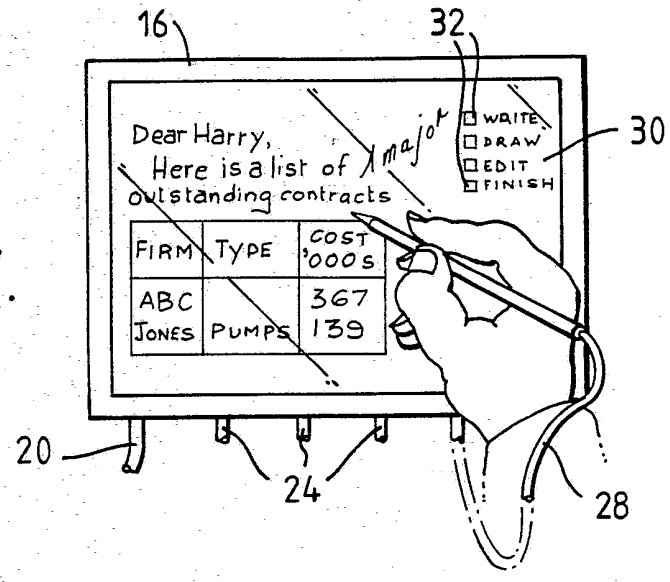


Fig. 7.

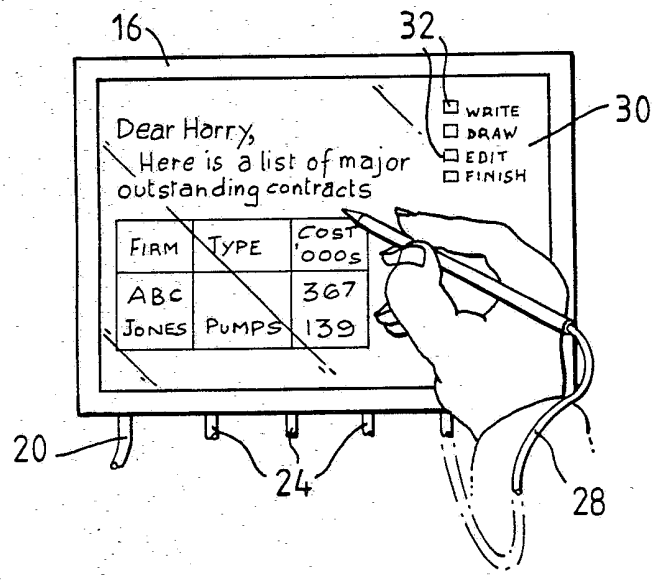
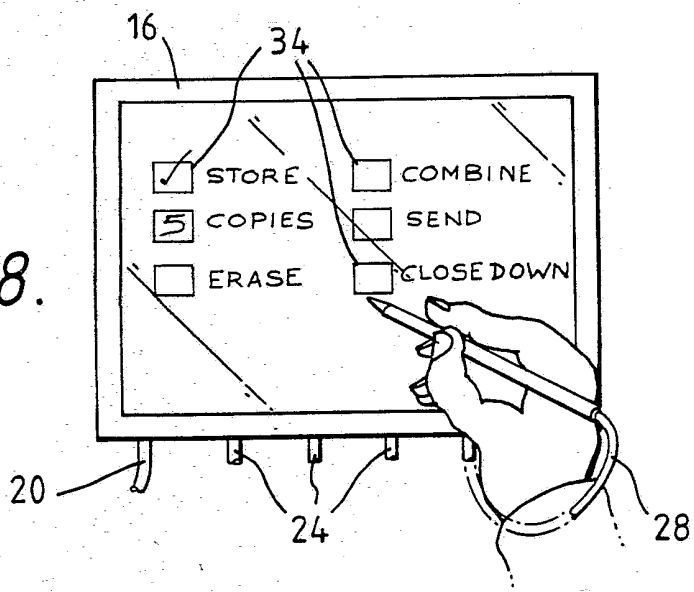


Fig. 8.



TRANSFORMING TEXT DEVICE

This invention relates to an apparatus for performing free hand work on one part of the apparatus, the apparatus being capable of recognising the free hand work and transforming it to a machine edited form.

There are at present two methods widely used for producing a final document. The first method is for a writer to produce a rough free hand draft script on a paper which is then typed either by the writer or by a typist on a typewriter. The other alternative method is to tape information on an audio equipment and send the tape to an audio typist, who replays the tape on the audio equipment to produce the document on a typewriter. In the above methods, if there are errors on the typed document, it has to be sent back to the typist for amendments or complete retyping of the document. A considerable amount of time is wasted for producing the document.

Recently there has been a wide use of a word processor system for providing the final document. The word processor comprises a keyboard, a visual display unit incorporating a processor unit and a printer. A written free hand script is type, either by the writer or by a skilled word processor operator through the keyboard and a typed text appears on the visual display unit. If the script is typed by the operator, a copy is printed on the printer and then sent to the writer and if there are any errors on the printed document, it is returned to the operator for amendments. A considerable amount of time is again wasted for producing the document. In the case of the script typed by the writer, the typed text appearing on the visual display unit may be checked by the writer and any required amendments may be made to the typed text prior to printing the final document. However to carry out work on the word processor, the writer would need to have a good understanding of the system and a substantial amount of training to acquire the necessary skills.

The object of the present invention is therefore to provide an apparatus of a kind where the free hand work may be performed on one part of the apparatus and means provided for recognising the free hand work and transforming it to a machine edited form.

According to the present invention an apparatus for performing a free hand work transformation into a machine edited form comprises a position sensing membrane, a display panel, a module including a control unit, the control unit being capable of connection to a source of

of electric supply and having one or more outputs capable of connection to an output device or devices, and a stylus extending from the control unit, whereby free hand work being performed by the stylus on the position sensing membrane generates a signal, means are provided for  
5 transmitting the generated signal to the control unit and further means provided for relaying the generated signal from the control unit to the display panel for displaying the free hand work, the control unit then processing the generated signal whereby the relayed generated signal from the control unit to the display panel is transformed to a processed  
10 signal for displaying the machine edited form.

Preferably, the display panel is part of the module.

Preferably, the position sensing membrane is positioned on the display panel.

Preferably, the control unit displays a primary menu, having a  
15 number of modes, on the display panel and each selection of the mode from the menu by a user sends a signal to the control unit for triggering an appropriate processing unit of the control unit to enable the user to perform a particular function.

Preferably, one of the selections from the primary menu allows  
20 the control unit to display a secondary menu, having a number of options, on the display panel. The secondary menu allows the user to process information which is retained or stored within a memory of the control unit.

The free hand work may be a natural cursive script, text editing  
25 symbol, diagram, table, bar-chart, pie-chart, histogram, or graph which may be written or sketched directly on the position sensing membrane with the stylus. In the case of, for example, natural cursive script writing, the machine edited form would appear in a typewritten form. A sketched drawing with dimensions, for example, in the machine edited  
30 form would appear as accurately drawn equivalent.

By way of example, one embodiment of the invention will be described with reference to the accompanying diagrammatic drawings of which,

Figure 1 is an exploded view of a device, in accordance with  
35 the invention,

Figure 2 is a block diagram of the device showing interconnecting circuits

Figure 3 is a plan view of the device in operation showing an example of a primary menu,

Figure 4 is a similar view to Figure 3 but showing an example in a write mode,

5 Figure 5 is a similar view to Figure 3 but in a draw mode and in an intermediate stage of a transformation,

Figure 6 is a similar view to Figure 3 but in an edit mode and the writing and a table in fully transformed form,

Figure 7 is a similar view to Figure 6 in fully transformed form  
10 incorporating a correction,

Figure 8 is a similar view to Figure 3, but showing a secondary menu.

With reference to Figures 1 and 2, a device 10 consists of a thin transparent position sensing membrane 12 and a plasma display panel 14  
15 which are position on a module 16. The module includes a control unit 18.

The control unit 18 is connected to a source of supply line 20 via a current interrupting element such as a fuse 22. The control  
20 unit 18 is also connected to the thin transparent position sensing membrane 12 by connecting 11 and the display panel 14 by connection 15. A plurality of terminals 24 extend from the control unit 18 and through the module 16 and each of these may be used for connecting, for  
example, a printer, keyboard, voice input member, or other equivalent  
25 device. The control unit 18 also has extending from it a cable through the module 16 and the other end of the cable is connected to a stylus 29.

In use, when current is supplied through the supply line 20, the control unit 18 sends a signal through connection 15 to the display  
30 panel 14 and a primary menu 30 as shown in figure 3 is displaced on a top right hand corner of the display panel 14. A square 32 also appears on the left hand side of each selection from the primary menu. A user may select from the primary menu, a write, draw, edit or finish mode.

35 Each of the modes may be selected in the following way for performing a particular function, for example, if the user wants the device to accept handwritten input, by touching the square 32 adjacent



the write mode with the stylus 29 a signal is generated. This signal is transmitted through the cable 28 and the connection 11 to the control unit 18 for triggering a write mode processing unit of the control unit 18 for accepting handwritten input. The user may, for example, perform writing on the thin transparent position sensing membrane 12 with the stylus 29. A signal is generated as the stylus 29 moves on the thin transparent positioning sensing membrane 12 and the generated signal is sent through the connection 11 to the control unit 18. The control unit 18 relays the generated signal through connection 15 to the display panel 14 for displaying the writing as shown in Figure 4. At the same time, the control unit 18 also processes the generated signal. When the control unit 18 has understood and processed the generated signal, after a short duration, the relayed generated signal through connection 15 to the display panel 14 is transformed to a processed signal for transforming the displayed writing on the display panel 14 with a typewritten equivalent as shown in Figure 5.

Similarly by selecting draw mode, as for write mode, a signal is transmitted through cable 28 and the connection 11 to the control unit 18 for triggering a draw mode processing unit of the control unit 18 for accepting, for example, a drawing. The user may, for example, sketch a table on the thin transparent position sensing membrane 12 with the stylus 29. A signal is generated as the stylus 29 moves on the thin transparent position sensing membrane 12 and the generated signal is sent through the connection 11 to the control unit 18. The control unit 18 relays the generated signal through connection 15 to the display panel 14 for displaying the sketched table, as shown in Figure 5. At the same time, the control unit 18 also processes the generated signal. When the control unit 18 has understood and processed the generated signal, after a short duration, the relayed generated signal through connection 15 to the display panel 14 is transformed to a processed signal for transforming the displayed sketched table on the display panel 14 with an accurately drawn equivalent as shown in Figure 6.

It is also possible to make changes to the handwritten input or sketched table by the user in the write or draw mode by selecting the edit mode. The selection of edit mode is similar to the write

or draw mode. A signal is transmitted through cable 28 and the connection 11 to the control unit 18 for triggering an edit mode processing unit of the control unit 18 for accepting, for example, any changes or correction to the handwritten input or drawing. The user may, for example, decide to incorporate a correction to the already handwritten input, which may have transformed to typewritten equivalent. A handwritten text editing symbol is performed on the thin transparent position sensing membrane 12 using the stylus 29 and the correction is incorporated. A further signal generated by the movement of the stylus 29 on the thin transparent position sensing membrane 12 are sent through the connection 11 to the control unit 18, which relays the further generated signal through connection 15 to the display panel 14 for displaying the handwritten text editing symbol and the correction, as shown in figure 6. At the same time, the control unit 18 also processes the further generated signal. When the control unit 18 has understood and processed the further generated signal with the already processed signal, after a short duration, the relayed further generated signal together with the already processed signal through connection 15 to the display panel 14 are transformed to a modified processed signal. The modified signal displays on the display panel 14, a transformed typewritten equivalent incorporating the correction as shown in figure 7.

When the user is satisfied with the information displayed on the display panel 14, the user may select the finish mode, as for any of the previous modes, and a signal is transmitted through cable 28 and the connection 11 to the control unit 18 for triggering a finish mode processing unit of the control unit 18. The processed signal or modified processed signal from the control unit 18 from connection 15 to display panel 14 are removed and retained in a memory of the control unit 18, and replaced by another signal for displaying a secondary menu on the display panel 14. The secondary menu may have, for example, list of options such as store, copies, erase, combine, send and close down as shown in Figure 8. A square 34 also appear on a left hand side of each options.

Each of the options except for the copies option may be selected in the following way for processing of the processed signal or modified processed signal, for example, if the user wants the control

unit 18 to store the processed signal or modified processed signal, by touching or ticking the square 34 adjacent the store option with the stylus 29, a signal is generated. This signal is transmitted through the cable 28 and the connection 11 to the control unit 18. The control unit 18  
5 processes the signal and stores the retained processed signal or modified processed signal in the memory of the control unit 18.

Similarly by selecting other options, as for store option, the control unit 10 will process the selected option.

In the case of copies option, the user may incorporate a number in  
10 the square 34 adjacent the copies option representing a number of print-outs that are required. A signal generated by the movement of stylus 29 in the square 34 adjacent the copies option on the thin transparent position sensing membrane 12 is transmitted through the connection 11 to the control unit 18. The control unit 18 processes  
15 the signal and sends an output signal to one of the output terminals 24 to which is connected a printer (not shown), for print-out of the processed signal or modified processor signal information. The user may select more than one option, as shown in Figure 8.

It will, of course, be realised by a person skilled in the art  
20 that the control unit 18 will have a recognising and transforming systems.

It will also be realised that the display panel is made up of picture elements (pixels), as is well known to a person skilled in the art.

25 It will be apparent from the invention that the user can use the device 10 as a paper to write a script and avoid producing the script on the paper, which will have to be typed for producing a final document.

It will also be apparent from the invention that the control unit  
30 18 of the device 10 is capable of recognising handwritten text editing symbols.

It is possible to incorporate additional modes with a square adjacent each mode in the primary menu 30. One of the additional modes may, for example, be used for indexing the store information in the memory of the control unit 18. Each of the additional modes may be  
35 selected by the user as for the previous described modes.

CLAIMS

What is claimed is:

1. An apparatus for performing a free hand work transformation into a machine edited form comprising a position sensing membrane, a display panel, a module including a control unit, the control unit being capable of connection to a source of electric supply and having one or more outputs capable of connection to an output device or devices, and a stylus extending from the module, whereby free hand work being performed by the stylus on the position sensing membrane generates a signal, means are provided for transmitting the generated signal to the control unit and further means provided for relaying the generated signal from the control unit to the display panel for displaying the free hand work, the control unit then processing the generated signal whereby the relayed generated signal from the control unit to the display panel is transformed to a processed signal for displaying the machine edited form.
2. An apparatus according to Claim 1 wherein the control unit displays a primary menu on the display panel and each selection from the primary menu by a user sends a signal to the control unit for triggering an appropriate processing unit of the control unit to enable the user to perform a particular function.
3. An apparatus according to Claim 2 wherein one of the selections from the primary menu allows the control unit to display a secondary menu which allows the user to process information retained or stored within a memory of the control unit.
4. An apparatus according to Claim 1 wherein the display panel is part of the module.
5. An apparatus according to Claim 1 wherein the position sensing membrane is positioned on the display panel.
6. An apparatus according to any one of the preceding Claim 1 wherein the position sensing membrane is transparent.
7. An apparatus substantially as described herein with reference to Figures 1-8 of the accompanying drawings.