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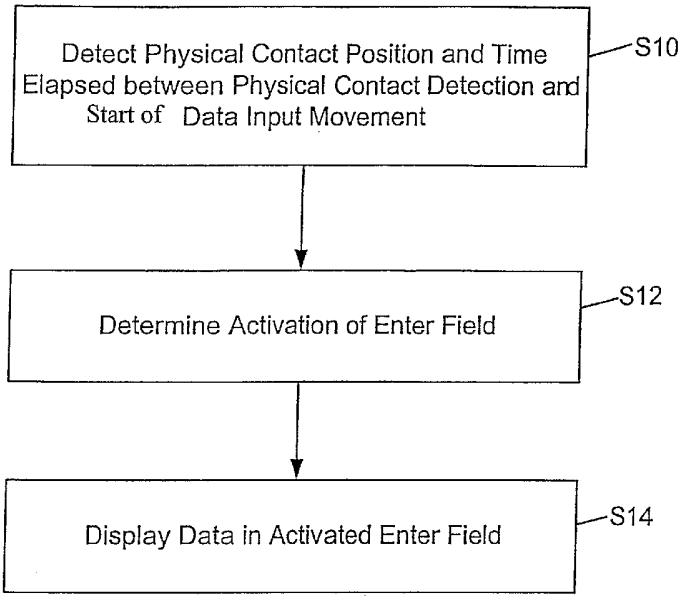

(57) Abstract: To support direct data input on a touch screen device having a plurality of enter fields for data input, wherein one enter field is activated for data display, a physical contact position and a time elapsed between a physical contact detection and start of a data input movement are detected. Then activation of an enter field for display of data is determined as a function of physical contact position and time elapsed between the physical contact detection and start of data input movement. Then, data is displayed in the activated enter field.

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Direct Data Input

FIELD OF INVENTION

The present invention relates to data input on a touch screen device, and in particular to a direct data input with reduced input steps.

TECHNICAL BACKGROUND

Handwriting recognition with touch screen devices, e.g., personal digital assistance or tablet personal computers, is a promising technology for data input as the use of a keyboard and a key pad is becoming obsolete. Here, handwriting recognition technologies enable the use to input text through direct manipulation, e.g., by using a stylus.

However, such many touch screen devices have permanent touch screen sub-areas specifically dedicated to handwriting recognition.

Therefore, a drawback of existing solutions for character input is that a significant part of the touch screen area is not available for data input and/or too many steps are necessary for entering data, as users initially have to

select in an enter field where the data will be displayed, move the input device to and fro from the touch screen and only then can enter data on the touch screen.

SUMMARY OF INVENTION

In view of the above, the object of the present invention is to support direct data input with touch screen devices.

According to the present invention, this object is achieved through a method of direct data input on a touch screen device having the features of claim 1 and a touch screen device having the features of claim 14.

According to the present invention, an enter field of the touch screen device may be defined on any sub-area of the touch screen and will be selected for display of characters in data input by the touch screen device user. Heretofore, it will be necessary to detect a physical contact position, e.g., a physical contact position of a pen, a stylus, a finger, or any other appropriate element capable of defining a position on the touch screen. Further, according to the present invention it is also proposed to measure the time elapsed between a physical contact detection and the detection of a subsequent data input movement.

Then, the determination of the activation of an enter field for display of data is achieved as a function of physical

contact position and time elapsed between the physical contact detection and start of data input movement. The activated enter field will then be used for display of data.

An important advantage of the present invention is that depending on the physical contact position and an appropriate timing of start of data input movement it is possible to select different enter fields for data display. In other words, it is not necessary to continuously move the input device to and fro from the touch screen so as to enter data after enter field activation. To the contrary, a single touch down on the touch screen in combination with data input movement after the predetermined time leads to the activation of a desired enter field and data display in this activated enter field.

According to a preferred embodiment of the present invention it is proposed to determine activation of an enter field and data display according to a set of display rules.

This rule based approach to direct data input is of particular benefit in considering and meeting requirements for a touch screen device having different configurations. In other words, irrespective of the type of enter field and other user interface elements configuration of a touch screen device, it will be possible to achieve direct input through set up of appropriate rules.

According to a preferred embodiment, one such rule is the displaying of data after physical contact release detection in an enter field already activated before physical contact detection, when this enter field is matching the physical contact position and data input movement is detected before a predetermined time limit.

Here, through appropriate timing the user of the touch screen device can trigger this display of data in an already activated enter field, in particular through immediate start of data input movement after touch down.

According to another preferred embodiment of the present invention it is proposed to maintain the activation of an enter field already activated before physical contact detection, when this activated enter field matches the physical contact position and no data input movement is detected before a predetermined time limit.

According to another preferred embodiment of the present invention, display of data is achieved after physical contact release detection in an enter field already activated before physical contact detection, when an enter field not being activated before physical contact detection is matching the physical contact position and data input movement is detected before a predetermined time limit.

Therefore, according to the present invention an initially activated enter field remains activated also if a further

enter field is matching the physical contact position, under the condition that the user of the touch screen device initiates data input before a predetermined time limit.

The implication of this preferred embodiment of the present invention is, that in view of appropriate timing the user may achieve data input over a wider range of the touch screen.

In other words, although data is input in an enter field initially not activated for data input, nevertheless, the data will be displayed in the initial enter field. Therefore, the user can achieve data input anywhere on the touch screen area without being restricted to a particular initially activated enter field.

According to another preferred embodiment of the present invention it is proposed to deactivate an enter field already activated before physical contact detection, to newly activate an enter field matching the physical contact position when no data input movement is detected before a predetermined time limit, and to display data in the newly activated enter field after data input and physical contact release detection.

Therefore, according to this preferred embodiment of the present invention, the only measure a user of the touch screen device has to take after contact detection is to wait for a pre-specified time and then to start data input without reciprocal movement of the input device to and fro from the

touch screen. Therefore, with this single operation and through appropriate timing the user of the touch screen device is in a position to not only initiate data input, but to also change enter fields for data display.

According to yet another preferred embodiment of the present invention display of data is achieved after physical contact release detection in an enter field initially activated before physical contact detection, when an actuatable user interface element is matching the physical contact position and data input movement is detected before a predetermined time.

According to the present invention, an actuatable user interface element may also be referred to as control other than an enter field and encompass, e.g., push buttons, radio buttons, combo boxes, bevel bottons, slide controls, tap controls or, in other words, graphic objects that cause instant actions or visible results when the user manipulates them.

According to this preferred embodiment the combined consideration of physical contact detection and input timing allows to incorporate user interface elements - in addition to enter fields - into the direct data input process.

According to yet another preferred embodiment of the present invention, the activation of an initially activated enter field remains unchanged, when an actuatable user interface

element is matching the physical contact position and no data input movement is detected before a predetermined time limit.

Again, also according to this preferred embodiment of the present invention the direct data input process is extended to user interface elements, even if no data input movement starts after physical contact detection.

According to another preferred embodiment of the present invention, data is displayed after physical contact release detection in an enter field already activated before physical contact detection, when an area of the touch screen to which no functionalities are allocated is matching the physical contact position and data input movement is detected.

Further to the above, according to this preferred embodiment it may be seen that the aspects of direct data input are not only applicable to enter fields and actuatable user interface elements, but also to any sub-area of the touch screen device, irrespective of whether functionality is assigned to such a sub-area or not.

According to another preferred embodiment of the present invention, the activation of an initially activated enter field, when an area of the touch screen to which no functionalities are allocated is matching the physical contact position and no data input movement is detected.

According to another preferred embodiment of the present invention it is proposed to support data input through data recognition.

According to yet another preferred embodiment of the present invention, it is proposed to achieve physical contact detection through pressure sensitive technology, light sensitive technology, and/or magnetic sensitive technology.

Therefore, according to the present invention the principles of flexible data input considering a plurality of enter fields may be achieved in view of any type of data input technology of any hybrid form thereof.

According to yet another preferred embodiment of the present invention it is proposed to enhance the enter field size after enter field actuation and until physical contact release.

An advantage of this preferred embodiment of the present invention is that it is of particular use when a plurality of enter fields are of a relatively small size and arranged adjacent to each other on the touch screen device.

According to another preferred embodiment of the present invention there is provided a computer program product directly loadable into the internal memory of a touch screen device comprising software code portions for performing the

inventive direct data input process when the product is run on a processor of the touch screen device.

Therefore, the present invention is also provided to achieve an implementation of the inventive method steps on computer or processor systems. In conclusion, such implementation leads to the provision of computer program products for use with a computer system or more specifically a processor comprised in, e.g., a touch screen device.

This programs defining the functions of the present invention can be delivered to a computer/processor in many forms, including, but not limited to information permanently stored on non-writable storage media, e.g., read only memory devices such as ROM or CD ROM discs readable by processors or computer I/O attachments; information stored on writable storage media, i.e. floppy discs and harddrives; or information convey to a computer/processor through communication media such as network and/or telephone networks and/or Internet via modems or other interface devices. It should be understood that such media, when carrying processor readable instructions implementing the inventive concept represent alternate embodiments of the present invention.

Overall, the present invention enables a touch screen device user to directly input data via a plurality of enter fields of a touch screen device. It allows for efficient use of touch screen real estate and achieves a reduction of the numerous steps usually required to enter data. Consequently,

reduced data input steps improve user navigation through a plurality of services operated by the touch screen device.

DESCRIPTION OF DRAWING

In the following, different aspects of the present invention will be explained with reference to the drawing in which:

Fig. 1 shows a schematic diagram of the touch screen device according to the present invention;

Fig. 2 shows flowchart of operation of the touch screen device shown in Fig. 1;

Fig. 3 shows further detailed flowchart of operation of the touch screen device shown in Fig. 1;

Fig. 4 illustrates a first rule of direct input according to the present invention;

Fig. 5 illustrates a second rule of direct input according to the present invention;

Fig. 6 illustrates a third rule of direct input according to the present invention;

Figs. 7(a) and 7(b) illustrate a fourth rule of direct input according to the present invention;

Fig. 8 illustrates a fifth rule of direct input according to the present invention;

Fig. 9 illustrates a sixth rule of direct input according to the present invention;

Fig. 10 illustrates a seventh rule of direct input according to the present invention; and

Fig. 11 illustrates an eighth rule of direct input according to the present invention.

DESCRIPTION OF BEST MODE AND PREFERRED EMBODIMENTS

In the following, different aspects, the best mode, and preferred embodiments of the present invention will be explained with reference to the drawing. Insofar as functionality according to the present invention is explained, it should be noted that such functionality may be implemented either in software or hardware and/or a combination thereof. Further, insofar as different aspects are explained, it should also be noted that such aspects may be easily combined to achieve additional implementations and realizations of the inventive concept of direct data input.

Fig. 1 shows a schematic diagram of the touch screen device according to the present invention.

As shown in Fig. 1, the touch screen device 10 for direct data input according to the present invention comprises a detection unit 12, an enter field controlling unit 14, and an input processing unit 16. Further, the detection unit comprises a configurable timer unit 18 and an input detection unit 20.

Here, it may be assumed that the different units are implemented exploiting functionalities of a processor or microcomputer comprised in the touch screen device, i.e. either in hardware or software or in combination thereof. Further, insofar as the operation of the different units requires storage in exchange of storage, again the hardware like RAM, ROM, ERPROM and bus structures available in touch screen devices will be used for implementing the present invention. Still further, it should be noted that a touch screen device in the sense of the present invention is any device allowing for data input via a screen through physical contact, i.e. a PDA, a mobile telephone, organizers, laptop computers, tablet PCs, workstations, etc.

Fig. 2 shows a flowchart of operation of the touch screen device shown in Fig. 1.

As shown in Fig. 2, the present invention relates to a method of direct data input on a touch screen device having a plurality of enter fields for a data input. In a first step S10 a physical contact position and a time elapsed between a

physical contact detection and a start of data input movement is detected. Here, a physical contact is related to initial touch down on the touch screen while data input movement is related to a movement of the input device over the area of the touch screen while maintaining physical contact. Also, one may assume that the time elapsed is a certain time between physical contact and start of data input movement, which time is an important aspect for display of data according to the present invention.

As shown in Fig. 2, in more detail the time elapsed between a physical contact detection and the start of a data input movement serves as basis for determination of activation of one of the plurality of enter fields in step S12 and for display of data in the determined activated enter field in step S14.

It should be noted that according to the present invention, a contact area may be different from an enter field previously activated before display of input data. This allows to resolve the one-to-one relationship between input of data and display of data, and therefore to increase flexibility for data input.

Operatively, the functionality according to step S10 is achieved by the detection unit 12 shown in Fig. 1, in particular the configurable timing unit 18 for measurement of the time elapsed between physical contact detection and start of data input movement, and the input detection unit 20 for

detection of physical contact and data input movement. Here, it should be noted that the configurality of the timer unit 18 allows to variably determine the predetermined time which forms the basis of activation of an enter field, as will be outlined in more detail in the following.

It should be noted that the configuration according to the present invention is achieved in any appropriate way, i.e. according to user profile data, user timing specification, user group specific information, operational context of the touch screen device, etc.

Further, the input detection unit 20 not only supports physical contact detection, but also detection of data input movement. Further, the input detection unit 20 may be operated on the basis of any type of pressure sensitive technology, light sensitive technology, and/or magnetic sensitive technology or any hybrid form thereof.

Therefore, configuration according to the present invention allows to adapt the operation style of an end user. Further, configuration may be achieved according to the type of services operated at the touch screen device, in view of user specific data like user profiles or user group information, and/or according to the operational context of the touch screen device.

Still further, the functionality according to step S12, i.e. the determination of an enter field for display of data as a

function of time elapsed between the physical contact detection and start of data input movement is achieved by the enter field controlling unit 14 shown in Fig. 1. Still further, display of data in the activated enter field according to step S14 is achieved by the input processing unit 16, which supplement to the functionality of data display also achieves additional tasks, e.g., control of display formats, display colours, etc.

Fig. 3 shows a more detailed flowchart of operation for the touch screen device shown in Fig. 1.

As shown in Fig. 3, initially there is detected a physical contact in the detection unit 12 according to step S16.

In a first interrogation in step S18 there is evaluated further the activated enter field matches the physical contact position. Then, in the affirmative case in a step S20 it is evaluated whether data input movement starts before a predetermined time period, i.e., lying in the range of 0 to 1 second. In the negative case, the enter field activated before physical contact detection remains activated, step S22. Otherwise, in a step S24 once a physical contact release is detected, followed by data display in the activated enter field in a step S26.

Further, is the interrogation in step S18 negative, there follows an interrogation whether an area or the touch screen to which no functionalities are allocated thereto matches the

physical contact position in a step S28, in the affirmative case there follows a further interrogation in a step S30 to check on start of data input movement. If such a data input movement does not start, the enter field activated before physical contact detection remains activated, step S32, while otherwise after physical contact release detection in step S24 data will be displayed in the initially activated enter field, step S26.

Further, if the interrogation in step S28 is negative, there follows a further interrogation whether an actuatable interface element matches the physical contact position in a step S34. In the affirmative case, there follows a further interrogation whether data input movement starts before the predetermined time limit in a step S36. In the negative case, the enter field activated before physical contact detection remains activated, step S38, while otherwise again after physical contact release detection in step S24 data will be displayed in the initially activated enter field according to step S26.

Further, when the interrogation step S34 is negative, in a step S40 it is concluded that the non-activated enter field matches the physical contact position, followed by an interrogation whether a data input movement starts before a predetermined time limit in a step S42. In the affirmative case, after physical contact release detection in step S24 data is displayed in the activated enter field in step S26.

If the interrogation in step S42 is negative, the enter field for display of data will be changed. Heretofore, in step S44 the enter field activated before physical contact detection is deactivated and the previously non-activated enter filed will be activated, then, in a step S46 it is interrogated whether data input starts. In the negative, the last activated enter field will remain activated, step S48, while otherwise, after physical contact release detection, step S50, data will be displayed in the last activated enter field in step S52.

According to the functionality explained with respect to Fig. 3, it should be noted that the interrogation steps, step S18, S20, S24, S28, S30, S34, S36, S40, S42, S46, S50, are achieved by the detection unit S12, shown in Fig. 1, while the enter field controlling steps, steps S22, S32, S38, S44, S48 are achieved by the enter field controlling unit 14, shown in Fig. 1, and the data display, step S26 and S52, are achieved by the input processing unit 16 shown in Fig. 1.

Further, it should be noted that while a specific order of interrogation has been discussed with respect to Fig. 3, the specific order of interrogation steps, in particular of steps S18, S28, S34, S40, is freely changeable within the scope of the present invention and not to be considered as binding on the present invention. In the following, the concept of direct data input according to the present invention will be explained with respect to related rules of direct data input and reference to Figs. 4 - 11.

Fig. 4 illustrates a first rule of direct input according to the present invention.

As shown in Fig. 4, according to the first rule of direct data input, data is displayed after physical contact release detection in an enter field f1 already activated before physical contact detection (see cursor in left part of Fig. 4), when this enter field f1 is matching the physical contact position and data input movement, here for character M, is detected before a predetermined time limit.

Fig. 5 shows a second rule of direct data input according to the present invention.

As shown in Fig. 5, according to the second rule of direct data input, the activation of an initially activated enter field f1 is maintained after contact release detection, when the activated enter field f1 matches the physical contact position and no data input movement is detected.

Fig. 6 shows a third rule of direct data input according to the present invention.

As shown in Fig. 6, according to the third rule, data is displayed after physical contact release detection in an enter field f1 already activated before physical contact detection, when an enter field f2 not being activated before physical contact detection is matching the physical contact

position and data input movement is detected before a predetermined time limit.

Fig. 7 shows a fourth rule of direct data input according to the present invention.

As shown in Fig. 7, this fourth rule of direct data input relates to the change of enter field for data display. In particular, according to the rule an enter field f1 already activated before physical contact detection is deactivated, an enter field f2 matching the physical contact position is newly activated, and data is displayed in the newly activated enter field f2 after physical contact release detection. The condition for applying the fourth rule of direct data input is that the newly activated enter field f2 matches the physical contact position and no data input movement is detected before the predetermined time limit.

Fig. 8 shows a fifth rule of direct data input according to the present invention.

As shown in Fig. 8, this fifth rule of direct data input relates to the incorporation of actuatable user interface elements into the direct data input process according to the present invention. According to this fifth rule it is proposed to display data after physical contact release detection in an enter field f1 already activated before physical contact detection, when an actuatable user interface element s1 (e.g., soft key) is matching the physical contact

position and data input movement detected before a predetermined time limit.

Fig. 9 shows a sixth rule of direct data input according to the present invention.

As shown in Fig. 9, according to the fifth rule, it is proposed to maintain an activation of an enter field f1 already activated before physical contact detection, when an actuatable user interface element s1 (e.g., soft key) is matching the physical contact position and no data input movement is detected before a predetermined time limit.

A further seventh and eighth rule shown in Figs. 10 and 11 are similar to the fifth and sixth rule. One difference is that instead of an actuatable user interface element the sub-area of the touch screen device not being related to user interaction, i.e. an area of the touch screen device to which no functionalities are allocated. Another difference is that a time limit is not considered.

While above different preferred embodiments of the present invention have been explained, it should be noted that the present invention is not restricted to any particular type of touch screen device and may be applied, without restricting scope of the present invention, e.g., to a personal digital agent PDA, a tablet PC, a mobile device of any type, e.g., a mobile telephone, a mobile organizer, etc. Also, the present invention may be well applied within any type of particular

operation system used for operation of the touch screen device, and is not restricted to a particular type of service requesting input of data. Also, insofar as the term 'input characters' has been used in the above, it should be noted that such term may cover any type of input, e.g., any type of alphabet, numbers, symbols, or graphical elements.

In view of the above, it should be noted that clearly the present invention may also be implemented using variations and modifications thereof which will be apparent and can be readily made by those skilled in the art without departing from the scope and spirit of the present invention.

Accordingly, it is not intended that the scope of claims appended hereto is limited to the description as set forth herein, but rather that the claims should be constructed so as to encompass all features of presentable novelty that preside in the present invention, including all features that would be treated as equivalent thereof by those skilled in the art to which the present invention pertains.

Claims

1. Method of direct data input on a touch screen device having a plurality of enter fields for data input, wherein one enter field is activated for data display, comprising the steps:

- detecting a physical contact position and a time elapsed between a physical contact detection and start of a data input movement;

- determining activation of an enter field for display of data as a function of physical contact position and time elapsed between the physical contact detection and start of data input movement; and

- displaying data in the activated enter field.

2. Method according to claim 1, ***characterized in that*** determining activation of an enter field is achieved according to a set of display rules.

3. Method according to claim 2, ***characterized in that*** displaying data is achieved after physical contact release detection in an enter field already activated

before physical contact detection, when this enter field is matching the physical contact position and data input movement is detected before a pre-determined time limit.

4. Method according to claim 2, ***characterized in that*** it comprises a step of maintaining activation of an enter field already activated before physical contact detection, when the activated enter field matches the physical contact position and no data input movement is detected before a predetermined time limit.

5. Method according to claim 2, ***characterized in that*** displaying data is achieved after physical contact release detection in an enter field already activated before physical contact detection, when an enter field not being activated before physical contact detection is matching the physical contact position and data input movement is detected before a pre-determined time limit.

6. Method according to claim 2, ***characterized in that*** it comprises a step of de-activating an enter field already activated before physical contact detection, a step of newly activating an enter field matching the physical contact position when no data input movement is detected before a predetermined time limit, and displaying data in the newly activated enter field after data input and physical contact release detection.

7. Method according to claim 2, ***characterized in that*** displaying of data is achieved after physical contact release detection in an enter field already activated before physical contact detection, when an actuatable user interface element is matching the physical contact position and data input movement is detected before a pre-determined time limit.

8. Method according to claim 2, ***characterized in that*** it comprises a step of maintaining an activation of an enter field already activated before physical contact detection, when an actuatable user interface element is matching the physical contact position and no data input movement is detected before a pre-determined time limit.

9. Method according to claim 2, ***characterized in that*** displaying of data is achieved after physical contact release detection in an enter field already activated before physical contact detection, when an area of the touch screen to which no functionalities are allocated is matching the physical contact position and data input movement is detected.

10. Method according to claim 2, ***characterized in that*** it comprises a step of maintaining an activation of an enter field already activated before physical contact detection, when an area of the touch screen to which no

functionalities are allocated is matching the physical contact position and no data input movement is detected.

11. Method according to one of the claims 1 to 10, ***characterized in that*** comprises a step of data input recognition.

12. Method according to one of the claims 1 to 11, ***characterized in that*** physical contact detection is achieved through pressure sensitive technology, light sensitive technology, and/or magnetic sensitive technology.

13. Method according to one of the claim 1 to 12, ***characterized in that*** it comprises the step of enhancing enter field size after enter field activation and until physical contact release.

14. Touch screen device for direct data input via a plurality of enter fields for data input, wherein one enter field is activated for data display, comprising:

- a detection unit adapted to detect a physical contact position and a time elapsed between a physical contact detection and start of a data input movement;

- an enter field controlling unit adapted to determine activation of an enter field for display

of data as a function of physical contact position and time elapsed between the physical contact detection and start of data input movement; and

- an input processing unit adapted to display data in the activated enter field.

15. Touch screen device according to claim 14, ***characterized in that*** the detection unit comprises a configurable timer unit adapted to measure the time elapsed between physical contact and data input movement.

16. Touch screen device according to claim 14 or 15, ***characterized in that*** the detection unit comprises an input detection unit adapted to recognize physical contact and/or data input movement.

17. Touch screen device according to claim 16, ***characterized in that*** input detection unit is adapted to detect physical contact through pressure sensitive technology, light sensitive technology, and/or magnetic sensitive technology.

18. Touch screen device according to one of the claims 14 to 17, ***characterized in that*** the enter field controlling unit is adapted to determine activation of an enter field according to a set of display rules.

19. Touch screen device according to claim 18, ***characterized in that*** the enter field controlling unit is adapted to maintain an activation of an enter field already activated before physical contact detection and that the input processing unit is adapted to display data after physical contact release detection in an enter field already activated before physical contact detection, when this enter field is matching the physical contact position and data input movement is detected before a pre-determined time limit.

20. Touch screen device according to claim 18, ***characterized in that*** the enter field controlling unit is adapted to maintain an activation of an enter field already activated physical contact detection, when this enter field matches the physical contact position and no data input movement is detected before a predetermined time limit.

21. Touch screen device according to claim 18, ***characterized in that*** the enter field controlling unit is adapted to maintain an activation of an enter field already activated before physical contact detection and that the input processing unit is adapted to display data after physical contact release detection in an enter field already activated before physical contact detection, when an enter field not being activated before physical contact detection is matching the physical contact

position and data input movement is detected before a pre-determined time limit.

22. Touch screen device according to claim 18, ***characterized in that*** the enter field controlling unit is adapted to de-activate an enter field already activated before physical contact detection and to newly activate an enter field matching the physical contact position when no data input movement is detected before a pre-determined time limit, and that the input processing unit is adapted to display data in the newly activated enter field after after data input and physical contact release detection.

23. Touch screen device according to claim 18, ***characterized in that*** the input processing unit is adapted to display data after physical contact release detection in an enter field already activated before physical contact detection, when an actuatable user interface element is matching the physical contact position and data input movement is detected before a pre-determined time limit.

24. Touch screen device according to claim 18, ***characterized in that*** the enter field controlling unit is adapted to maintain an activation of an enter field already activated before physical contact detection, when an actuatable user interface element is matching the

physical contact position and no data input movement is detected before a pre-determined time limit.

25. Touch screen device according to claim 18, ***characterized in that*** the input processing unit is adapted to display data after physical contact release detection in an enter field already activated before physical contact detection, when an area of the touch screen to which no functionalities are allocated is matching the physical contact position and data input movement is detected.

26. Touch screen device according to claim 18, ***characterized in that*** the enter field controlling unit is adapted to maintain an activation of an enter field already activated before physical contact detection, when an area of the touch screen to which no functionalities are allocated is matching the physical contact position and no data input movement is detected.

27. Touch screen device according to one of the claim 13 to 26, ***characterized in that*** the enter field controlling unit is adapted to enhance enter field size after enter field activation and until physical contact release.

28. Computer program product directly loadable into the internal memory of a touch screen device, comprising software code portions for performing the steps if one

of the claims 1 to 13, when the product is run on a processor of the touch screen device.

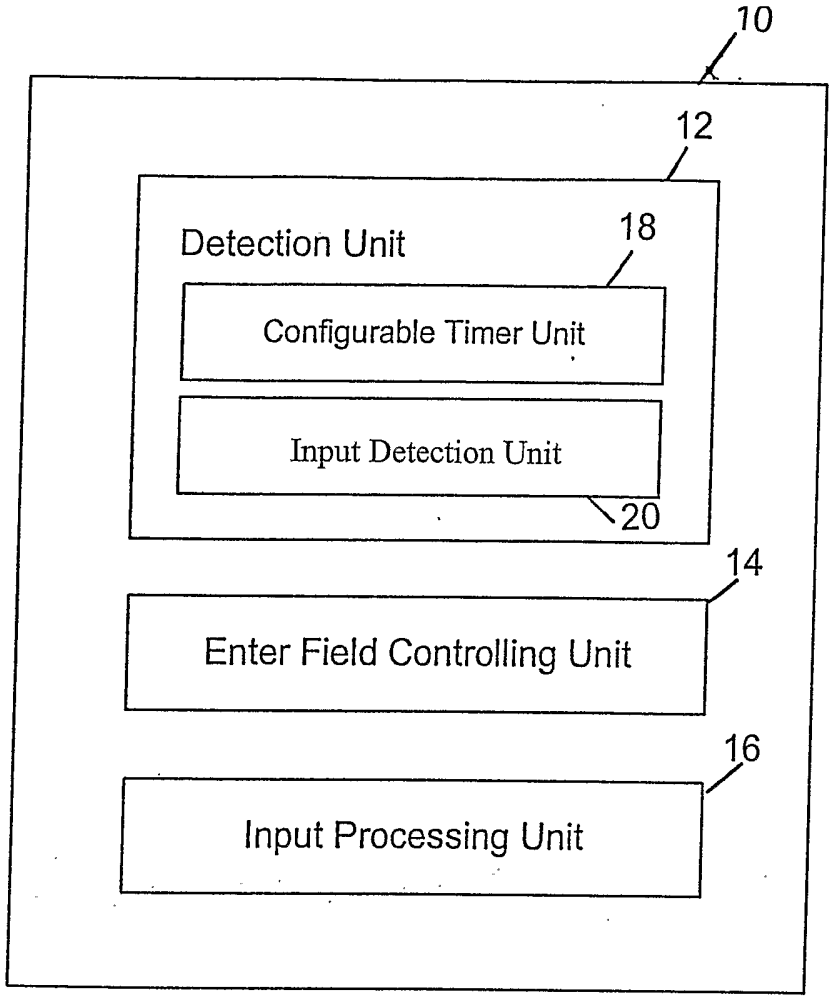

10
12
Detection Unit
18
Configurable Timer Unit
Input Detection Unit
20
14
Enter Field Controlling Unit
16
Input Processing Unit

Fig. 1

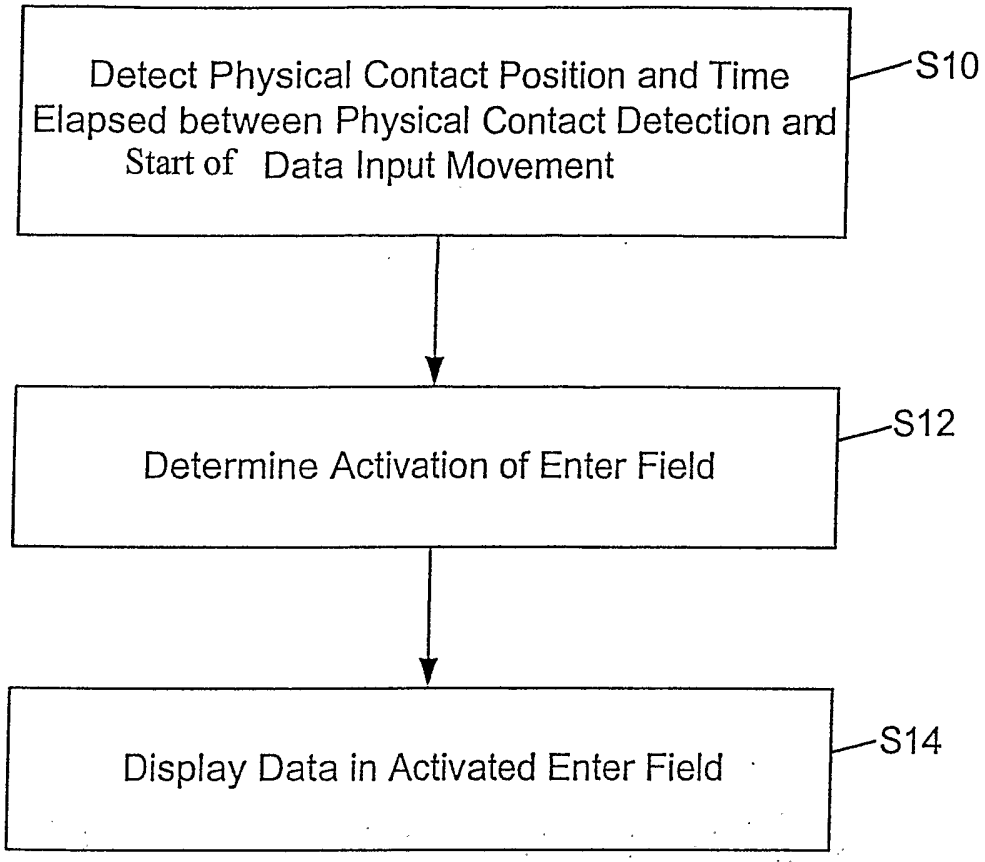

Detect Physical Contact Position and Time Elapsed between Physical Contact Detection and Start of Data Input Movement
S10
Determine Activation of Enter Field
S12
Display Data in Activated Enter Field
S14

Fig. 2

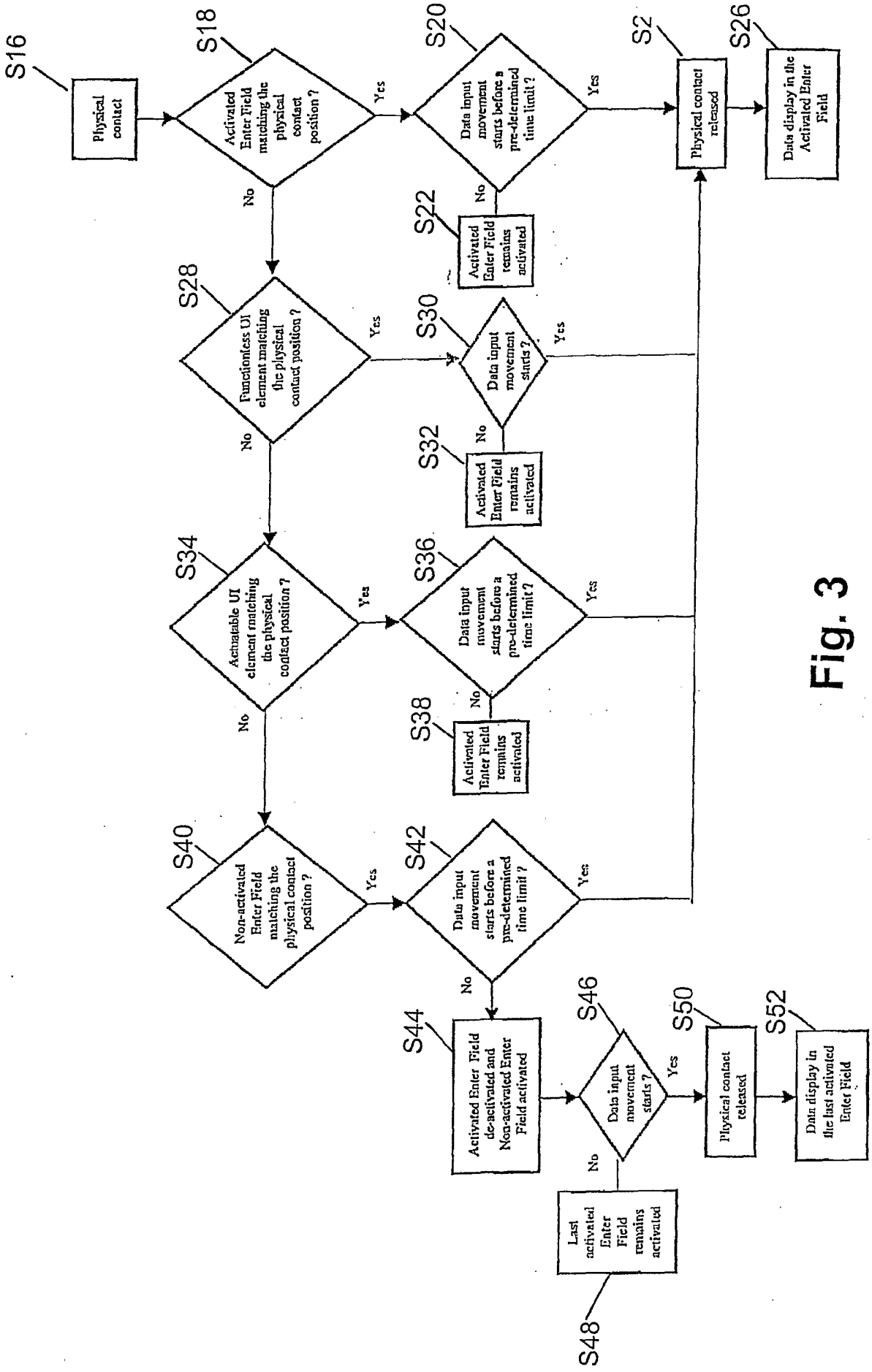

S16
Physical contact
S18
Activated Enter Field matching the physical contact position ?
Yes
No
S20
Data input movement starts before a pre-determined time limit ?
Yes
No
S22
Activated Enter Field remains activated
S2
Physical contact released
S26
Data display in the Activated Enter Field
S28
Functionless UI element matching the physical contact position ?
Yes
No
S30
Data input movement starts ?
Yes
No
S32
Activated Enter Field remains activated
S34
Actuatable UI element matching the physical contact position ?
Yes
No
S36
Data input movement starts before a pre-determined time limit ?
Yes
No
S38
Activated Enter Field remains activated
S40
Non-activated Enter Field matching the physical contact position ?
Yes
S42
Data input movement starts before a pre-determined time limit ?
Yes
No
S44
Activated Enter Field de-activated and Non-activated Enter Field activated
S46
Data input movement starts ?
Yes
No
S48
Last activated Enter Field remains activated
S50
Physical contact released
S52
Data display in the last activated Enter Field

Fig. 3

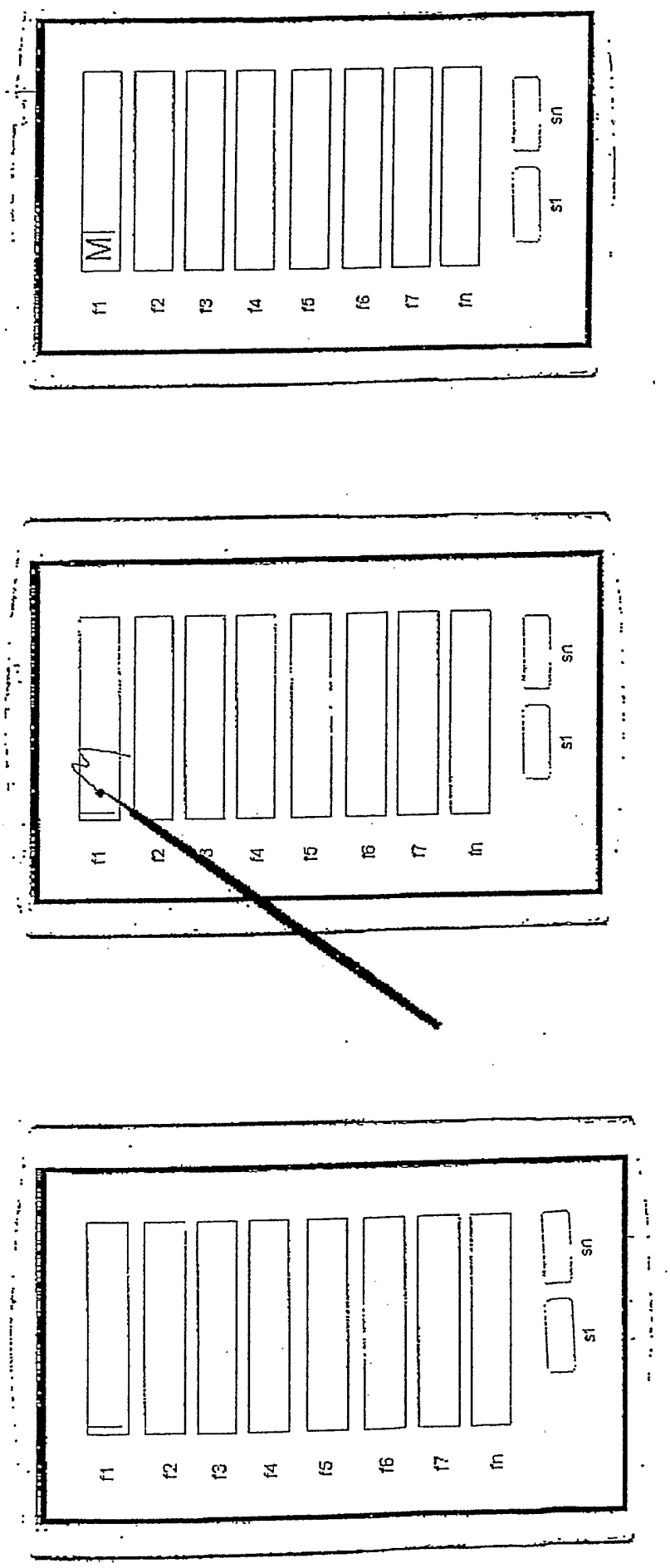


Fig. 4

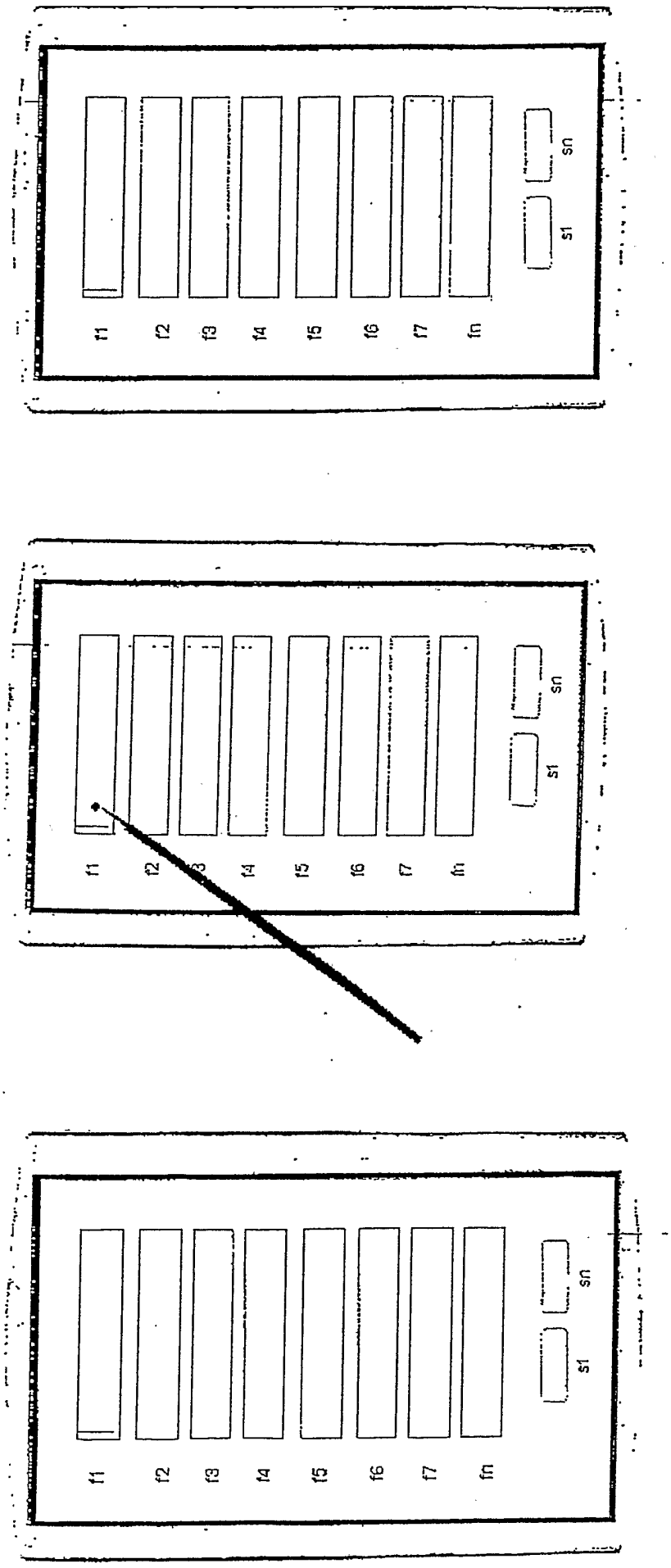


Fig. 5

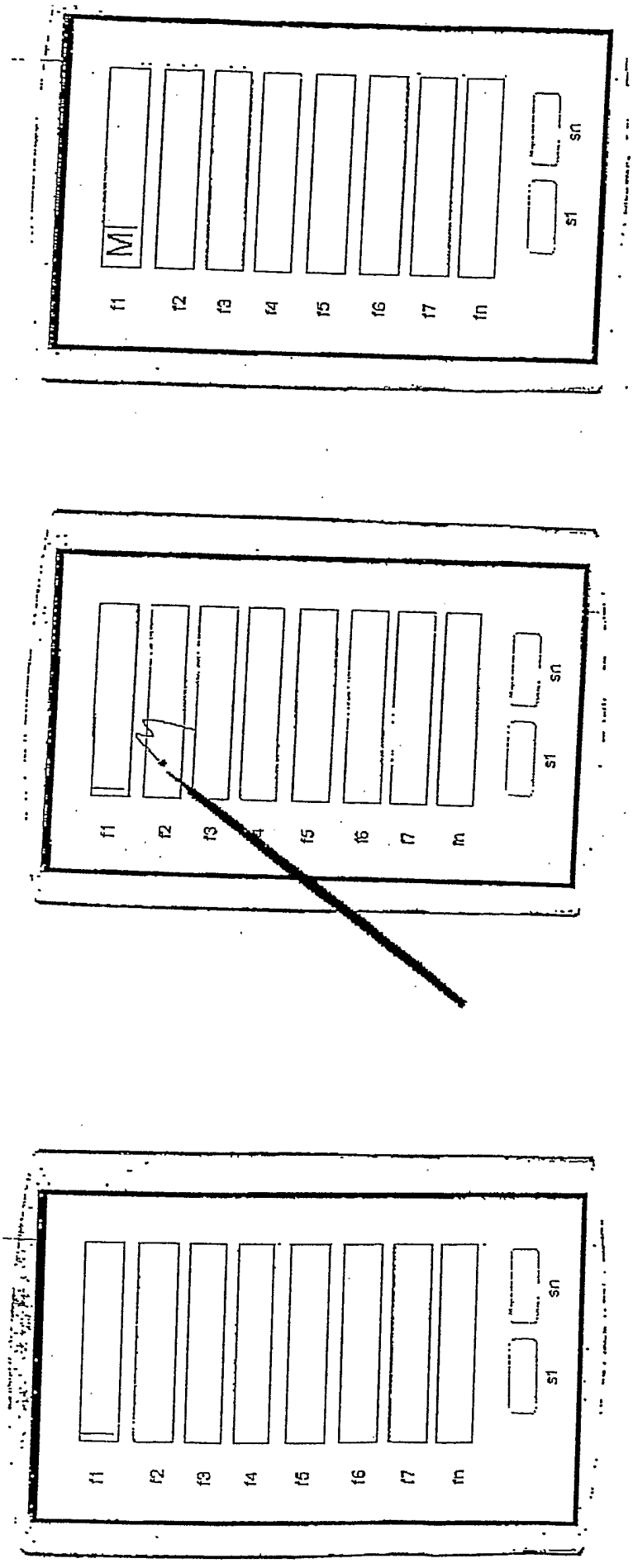


Fig. 6

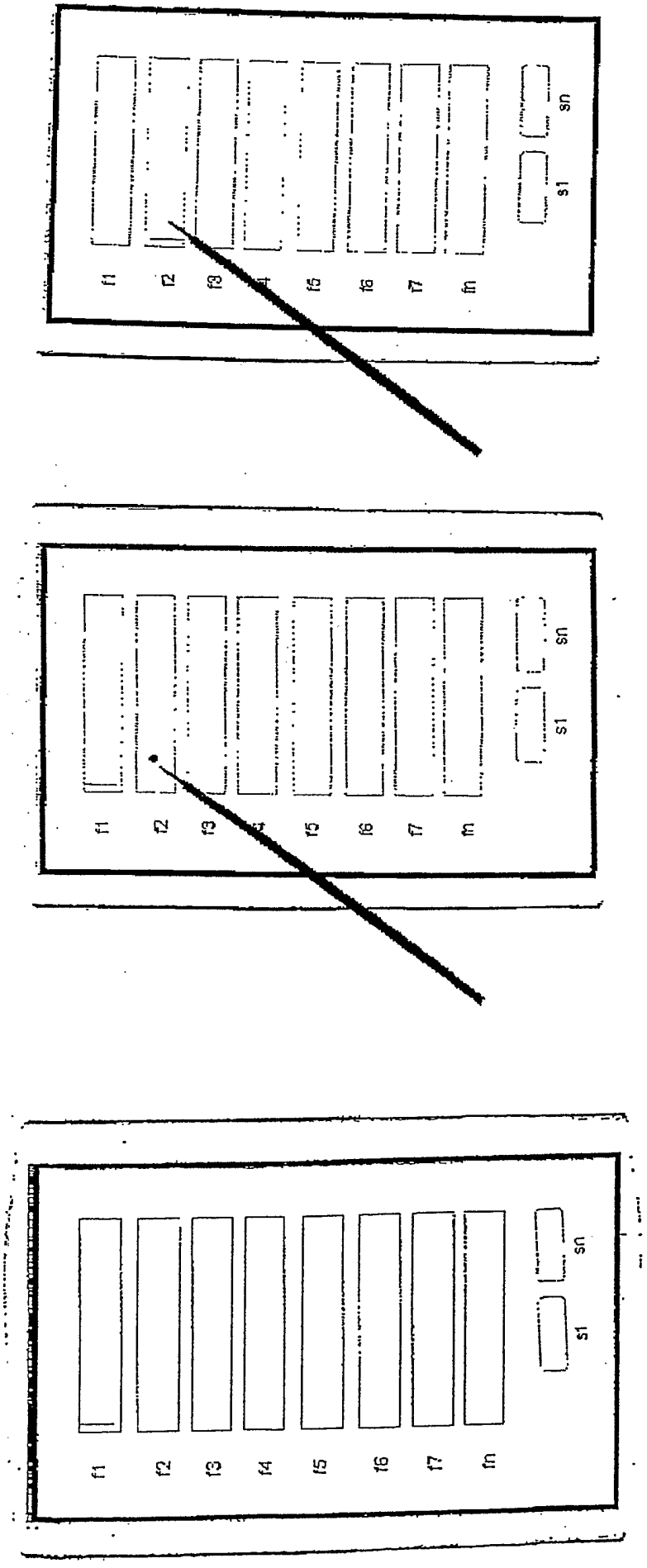
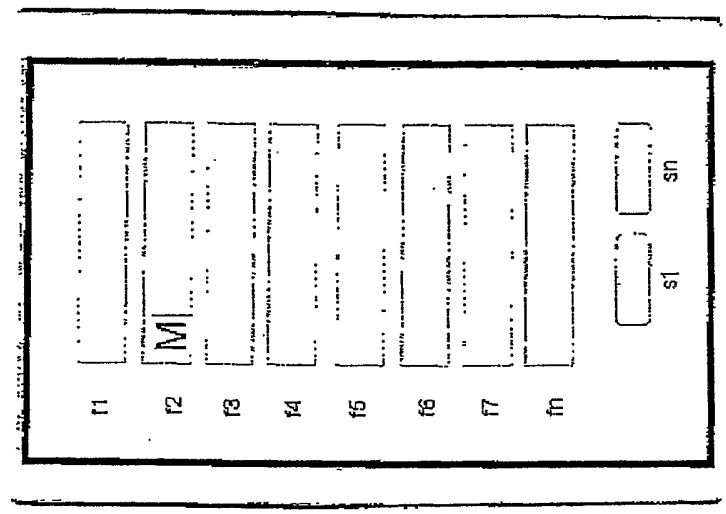


Fig. 7(a)



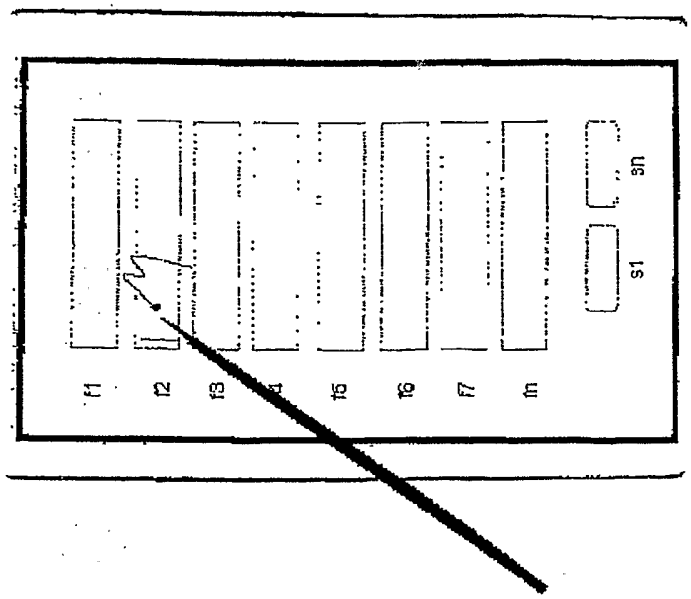


Fig. 7(b)

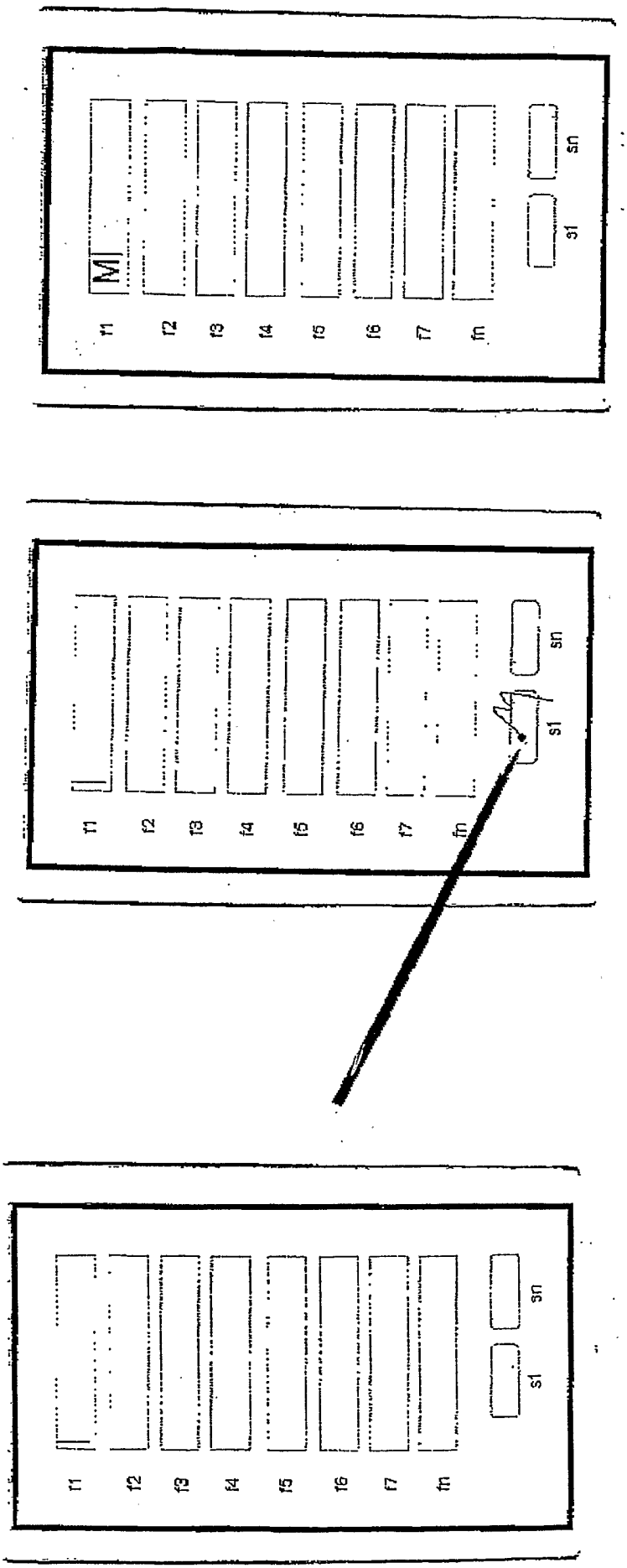


Fig. 8

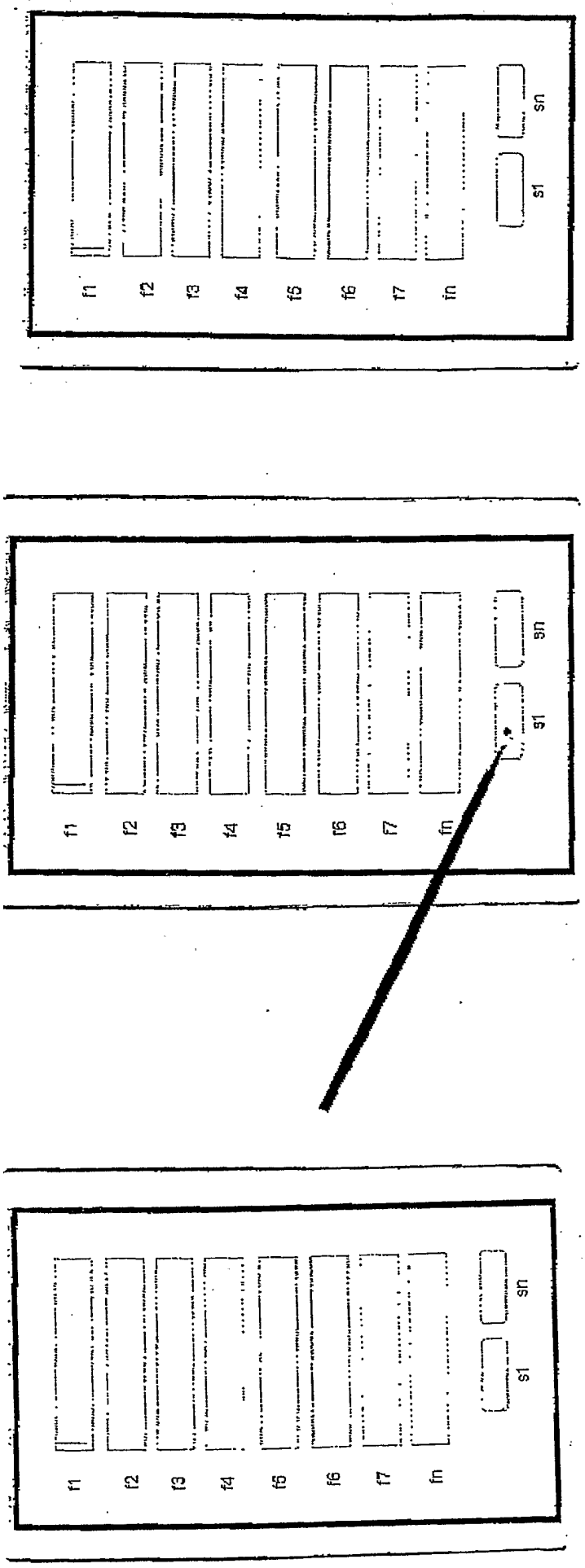
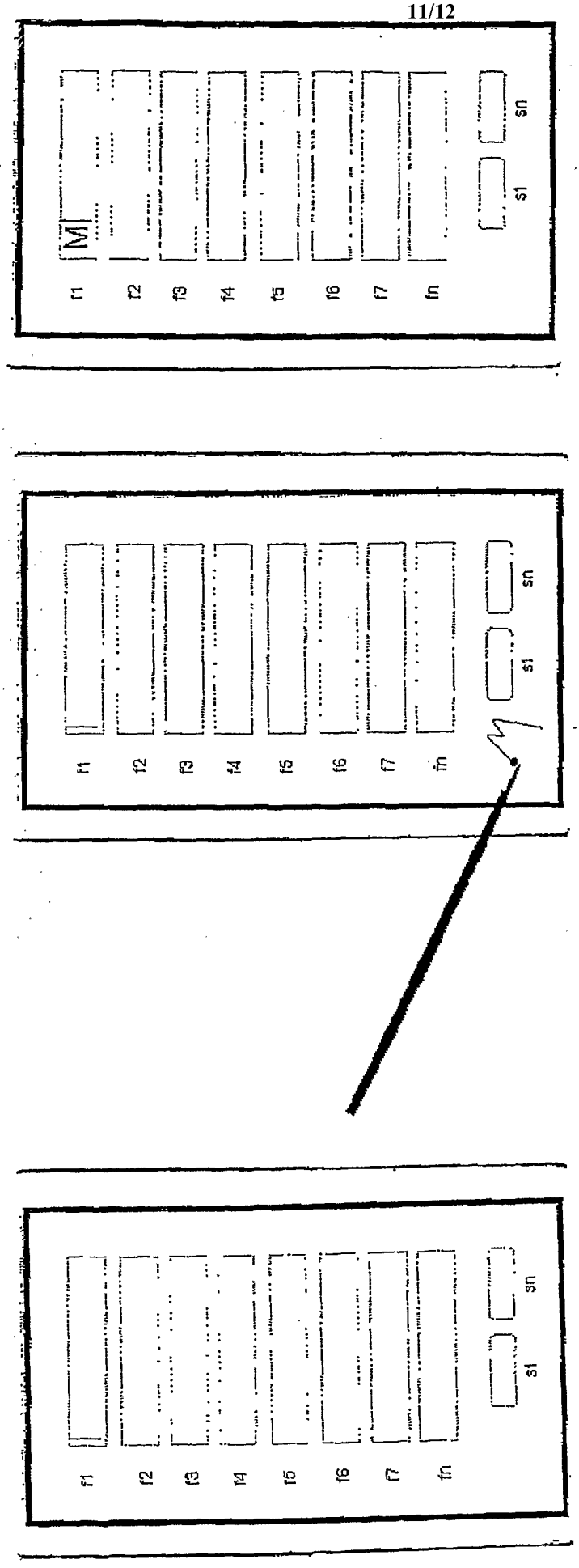


Fig. 9


M
f1
f2
f3
f4
f5
f6
f7
fn
s1
sn

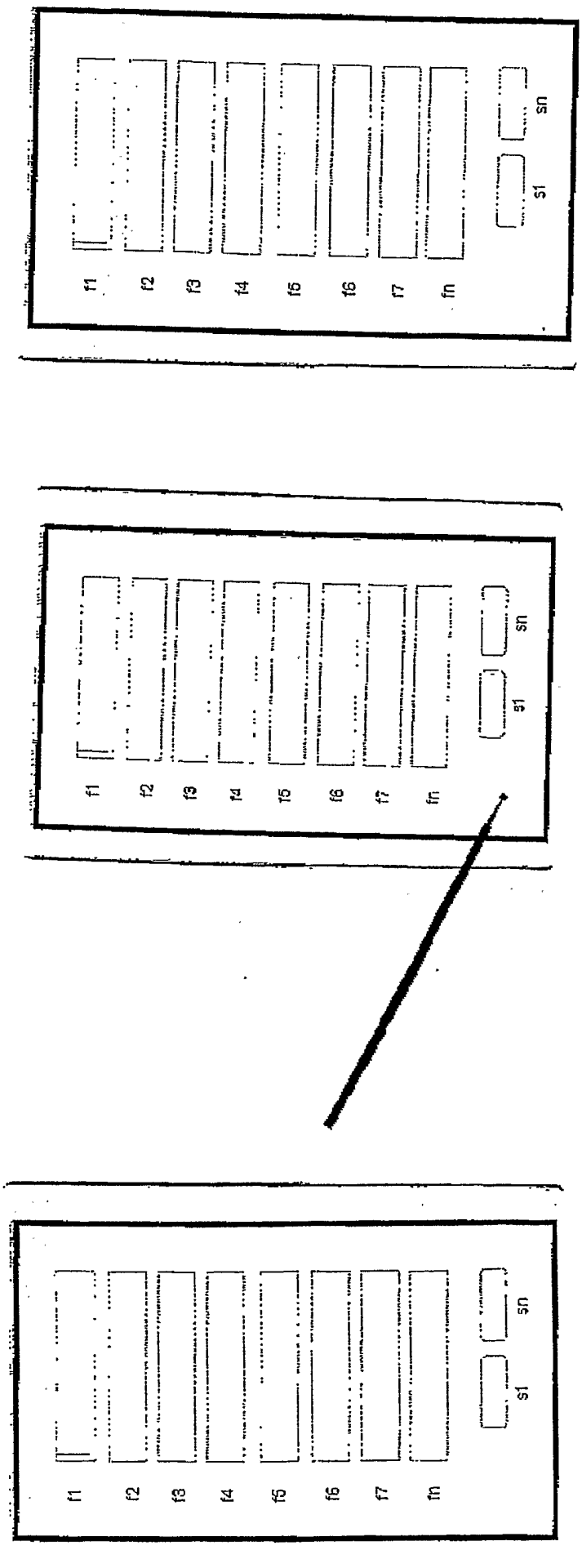


Fig. 11

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/09055

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F3/033

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)
IPC 7 G06F

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ, IBM-TDB, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	EP 0 394 614 A (IBM) 31 October 1990 (1990-10-31) page 11, line 33 -page 12, line 35; figures 1,2,6,8	1,11,14, 16,28 3-10, 19-26
X A	US 2003/038788 A1 (DEMARTINES PIERRE ET AL) 27 February 2003 (2003-02-27) paragraph '0006! - paragraph '0009!	1,14,28 3-10, 19-26
X A	US 6 049 329 A (ZETTS JOHN MARK ET AL) 11 April 2000 (2000-04-11) column 1, line 48 -column 2, line 4; figure 4	1,3-10, 14, 19-26,28 13,27

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 April 2004	28/04/2004

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Mouton, B

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/09055

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 956 423 A (BISHOP BRYON DEAN ET AL) 21 September 1999 (1999-09-21) column 4, line 36 - line 64; figure 2 ---	3-10, 19-26
A	US 2002/056575 A1 (CUKIERMAN RYAN EDWARD ET AL) 16 May 2002 (2002-05-16) paragraph '0030!; figures 1-5 -----	1,14,28

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[redacted]information on patent family members

International Application No
PCT/EP 03/09055

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