the switch circuits through transmission of forces;

a sensor circuit means for detecting a degree of direct touch or proximity of a finger to all or a part of keys;

a data processing means for judging or predicting a intentional direct touch or proximity of the finger to a specific key by data processing of a value produced by the sensor circuit means or a change with time of the value, and thus obtaining information codes corresponding to the key;

a first display means for displaying the information codes obtained by the data processing means; and

a second display means for displaying, in a manner different from that of the first display means, when the switch circuit is closed by pressing the specific key , a corresponding specific information code ; and

9. An information input apparatus according to claim 8, wherein

when a plurality of the keys are made corresponding to the degree of the proximity, the degree of the proximity is indicated by designating the corresponding information codes to a physical positions of the keys and specific color or shape.

10. An information input apparatus according to claim 1, further comprising

switching circuits for producing a demand to perform a given data processing action,

process demand key for opening and closing the switching circuits through transmission of forces, and

a third display means for displaying a symbol or dialogue implying a type of the data processing action in response to a physical pattern of the keys, in which

when the process demand key is pressed ,

when the direct touch or proximity of the finger to the keys is detected, its corresponding symbol or dialogue implying a type of the data processing action is displayed by the third display means and when the keys are pressed, the corresponding data processing action can be performed.

11. An information input apparatus according to claim 10, further comprising

a fourth display means arranged to display a text explaining the demand while the symbol or dialogue implying the type of the data processing action being displayed by the third display means when the process demand key has been pressed and the direct touch or proximity of the finger to the keys has been detected.

12. An information input apparatus according to claim 1, wherein

each of the keys has a plurality of the sensors for detecting direct touch or proximity of a finger to the keys so that the direct touch or proximity of the finger to the keys can be expressed in a form of a detailed coordinate data.

13. An information input apparatus comprising:

a plurality of switch circuits;

an array of keys for opening and closing the switch circuits through transmission of forces;

a plurality of sensors for detecting direct touch or proximity of a finger to all or a part of keys;

a signal processing means for receiving and processing data outputs from the sensors and switch circuits;

a first display means for displaying in a certain form such as a bit map , the direct touch or proximity to the keys detected by the sensors in response to physical pattern of the sensors;

a detailed data command switch for commanding display of a detailed data; and

a detailed data display means responsive to the detailed data command switch for displaying in a more detailed form the keys to which the finger is in direct touch or proximity as detected by the sensors ,in response physical pattern of the sensors,

in which when the specific key is pressed and its switch circuit is closed, corresponding input information codes are entered.

14. An information input apparatus comprising:

a housing of a hand size having a palm-rest on a near side thereof;

a plurality of switch circuits and an array of peripheral keys for opening and closing the switch circuits through transmission of forces, those being mounted on a peripheral edge of the housing upwardly of the palm-rest;

an array of central keys mounted in a recess of the housing surrounded by the peripheral keys and the palm-rest;

a plurality of thumb proximity sensors mounted on a lower part of the housing for detecting direct touch or proximity of an object;

a plurality of proximity sensors for detecting direct touch or proximity of an object to the central keys;

a movement detecting means for detecting a movement of the housing;

an input data processing means for receiving and processing data outputs from the switch circuits, thumb proximity sensors, and movement detecting means;

a display means for displaying the data outputs; and

a communicating means for communicating with other apparatuses than the housing.

15. An information input apparatus according to claim 14, wherein

a set of thumb proximity sensors are further provided on an openable tab mounted on a side of the housing for detecting direct touch or proximity of an object.

16. An information input apparatus comprising:

a plurality of switch circuits;

an array of keys for opening and closing the switch circuits through transmission of forces;

a plurality of recesses provided in a peripheral edge of a housing for insertion of a finger;

a plurality of finger proximity sensors mounted in the recesses respectively for detecting direct touch or proximity of an object;

a plurality of thumb proximity sensors mounted on a peripheral edge of the housing for detecting direct touch or proximity of an object; and

a data processing means for receiving and processing data outputs from the finger proximity sensors, thumb proximity sensors, and switch circuits,

in which information codes data pattern assigned in relation to the switch circuits can be changed by a combination of the insertion or proximity of the object to one of the recesses and the insertion or proximity of the object to the thumb proximity sensor.

17. An information input apparatus comprising:

a housing of a hand size;

an array of keys;

a plurality of recesses provided about the keys at a distance accessible with a finger;

a plurality of position sensors for detecting the position of a finger across the keys;

a plurality of proximity sensors mounted in the recesses respectively;

a plurality of thumb proximity sensors mounted on the housing for detecting direct touch or proximity of an object; and

a data processing means for receiving and processing data outputs from the position sensors, proximity sensors, and thumb proximity sensors,

in which a visual pattern is determined by a combination of the insertion or proximity of the object to the recess , the insertion or proximity of the object to the thumb proximity sensor, and the position sensors.

18. An information input apparatus according to claim 14, wherein

a surface level of the keys mounted in the recess is lowered towards the palm-rest and raised towards the thumb proximity sensors.

19. An information input apparatus comprising:

a housing of a hand size;

an array of keys corresponding to information codes;

a plurality of position sensors for detecting the position of an object across the keys;

a movement detecting means for detecting a movement of the housing;

an input data processing means for receiving and processing data outputs from the position sensors and movement detecting means;

a display means : and

wherein the display means displays on its screen a coordinate pattern according to the keys in response to a data output from the input data processing means, points out a position in the coordinate pattern in response to a data output of the position sensor, and allows the coordinate pattern with its pointed position to be moved in response to a movement output of the movement detecting means.

20. An information input apparatus comprising:

a correct command switch for instructing a correcting action;

a plurality of switch circuits;

an array of keys for opening and closing the switch circuits through transmission of forces;

a plurality of proximity sensors for detecting direct touch or proximity of an object to the keys;

a first controlling means responsive to a command output of the correct command switch ,for displaying on a display screen a word or a partial character string of a word approximate to an inputted word or a partial character string of a word as candidates through citation with a built-in dictionary in response to the keys ; and

a second controlling means responsive to informations from the proximity sensors for identifying a candidate which corresponds to the keys determined by the direct touch or

proximity of the object among the candidates on the screen ,

in which when the keys are pressed, their corresponding word or a partial character string a word is entered as a correct word or a partial character string of a word.

21. An information input apparatus according to claim 20, further comprising

a plurality of thumb proximity sensors for detecting direct touch or proximity of a thumb , wherein

while specifying one word or a partial character string among the displayed candidates by direct touch or proximity of the finger to the corresponding keys , a part of the word or a partial character string of the specified candidate is selected in color inverse manner and so on by sliding direct touch or proximity of the thumb to thumb proximity sensors , and when a desired part of the word or a partial character string is selected , an only desired character string is entered by pressing corresponding keys.

22. An information input apparatus comprising:

a plurality of switch circuits:

an array of keys for opening and closing the switch circuits through transmission of forces;

a plurality of finger proximity sensors for detecting direct touch or proximity of an object to the keys;

a first controlling means for predicting a candidate of character string which is to be next entered , by using a dictionary or grammatical rules from inputted characters and displaying them in response to a physical pattern of the keys;

a selection mode selector switch for shifting to a mode for selecting a candidate : and

a second controlling means responsive to outputs of the finger proximity sensors for specifying the plural displayed candidates by the switching of the selection mode selector switch ,

in which when the keys are pressed the candidate corresponding to the keys is entered .

23. An information input apparatus according to claim 22, further comprising

a plurality of thumb proximity sensors for detecting direct touch or proximity of a thumb , wherein

while specifying one word or a partial character string among the displayed candidates by direct touch or proximity of the finger to the corresponding keys , a part of the word or a partial character string of the specified candidate is selected in color inverse manner and so on by sliding direct touch or proximity of the thumb to thumb proximity sensors , and when a desired part of the word or a partial character string is selected , an only desired character string is entered by pressing corresponding keys.

24. An information input apparatus comprising:

a plurality of switch circuits:

an array of keys for opening and closing the switch circuits through transmission of forces;

a plurality of finger sensors for detecting direct touch or proximity of an object to all or a part of the keys;

a plurality of thumb sensors mounted separately of the finger sensors , for detecting direct touch or proximity of a thumb;

a signal processing means for receiving and processing data outputs of the finger sensors, thumb sensors, and switch circuits;

a display means (A) for displaying a plurality of information codes assigned to the keys;

a display means (B) for specifying selectively the information codes in response to an output of the finger sensor; and

a display means (C) for further specifying selectively the the information codes in response to an output of the thumb sensor.

25. An information input apparatus comprising:

a plurality of switch circuits:

an array of keys for opening and closing the switch circuits through transmission of forces;

a plurality of thumb proximity sensors for detecting direct touch or proximity of an object; and

a signal processing means for receiving and processing data outputs of the thumb proximity sensors and switch circuits, in which

specifying one of the thumb proximity sensors by a detection of direct touch or proximity action of the thumb and specifying one of the keys by pressing of other finger or fingers than the thumb are executed ,

a plurality of information codes are made corresponding to combinations of both the specifyings and entry is executed , and

the thumb proximity sensors are provided at an upper surface of a housing.

26. An information input apparatus comprising:

a plurality of switch circuits:

an array of keys for opening and closing

the switch circuits through transmission of forces;

a plurality of thumb proximity sensors for detecting direct touch or proximity of an object; and

a signal processing means for receiving and processing data outputs of the thumb proximity sensors and switch circuits, in which

specifying one of the thumb proximity sensors by a detection of direct touch or proximity action of the thumb and specifying one of the keys by pressing of other finger or fingers than the thumb are executed ,

a plurality of information codes are made corresponding to combinations of both the specifyings and entry is executed , and

the thumb proximity sensors are provided on a switch plate set on an upper surface of a housing.

27. An information input apparatus comprising:

a plurality of switch circuits:

an array of keys for opening and closing the switch circuits through transmission of forces;

a plurality of thumb proximity sensors for detecting direct touch or proximity of an object; and

a signal processing means for receiving and processing data outputs of the thumb proximity sensors and switch circuits, in which

specifying one of the thumb proximity sensors by a detection of direct touch or proximity action of the thumb and specifying one of the keys by pressing of other finger or fingers than the thumb are executed ,

a plurality of information codes are made corresponding to combinations of both the specifyings and entry is executed , and

the each thumb proximity sensors for detecting a position of the thumb comprises a plurality of small sensors , the small sensors aligned lengthwisely of the thumb.

28. An information input apparatus according to any of claims 2 to 4, 6, 14 to 18, 21, and 23 to 27, wherein

a number of the thumb proximity sensors is not equal to a number of kinds of information specifying given with a position of the thumb.

29. An information input apparatus according to any of claims 2 to 4, 6, 14 to 18, 21, and 23 to 27, wherein

some of the thumb proximity sensors are replaced with a plurality of little finger proximity sensors for detecting direct touch or proximity of a little finger.

30. A cover for covering a main housing, characterized that as the cover is inwardly foldable at a center, its half separated from the other half by folding has an enlarging reflector mirror mounted on an inner side thereof and the other half has a display device mounted pivotably on the inner side thereof so that when the cover is opened , a folding part are folded , and the display device is opened , and thereby an image on the display device can clearly be viewed through the enlarging reflector mirror and when the cover is closed, the holding part is stretched and the display is stored inside the cover.

31. A cover according to claim 30, wherein

the cover is pivotably mounted to the main housing for opening and closing so that the enlarging reflector mirror is directly viewed from the near side when the cover is opened.

32. A cover according to claim 30 or 31, wherein

the cover is detachably mounted to the main housing and it can be detachably attached to a head band.

33. A cover according to claim 32, wherein

while the cover being attached to the head band, its half accompanied with the display apparatus is joined to a holder of the head band and the other half with the enlarging reflector mirror is folded as hangs down.

34. A cover according to any of claims 30 to 33, wherein

the main housing is a data entry apparatus defined in any one of claims 1 to 29.

35. An information input apparatus comprising:

proximity sensors for detecting direct touch or proximity of an object and producing a positional coordinate data of the object;

a tablet to which the proximity sensors are mounted respectively;

a touch degree judging means for determining that the touch of the object to the proximity sensors is greater than a predetermined degree; and

a touch indicating means for indicating in a physical form a fact that the touch of the object to the proximity sensors is greater than the predetermined degree as determined by the touch degree judging means, in which

when the touch degree of the object to the proximity sensors is not greater than the predetermined degree, a center position of the

object is given as a coordinate data and when the touch degree is greater than the predetermined degree, information is issued as a selection of the positional coordinate .

36. An information input apparatus comprising:

proximity sensors for detecting direct touch or proximity of an object and producing a positional coordinate data of the object;

a tablet to which the proximity sensors are mounted respectively;

a touch degree judging means for determining that the touch of the object to the proximity sensors is greater than a predetermined degree;

a touch indicating means for indicating in a physical form a fact that the touch of the object to the proximity sensors is greater than the predetermined degree as determined by the touch degree judging means; and

a data switching means for selecting whether a positional coordinate data of the object is directly issued or is issued with correspondence to key positions which are beforehand allocated to the tablet, in which

when it is issued with correspondence to the key positions ,

only the corresponding key code position is issued when the touch degree of the object is not greater than the predetermined degree and

a selected information of the key code is issued when the touch degree is greater than the predetermined degree, and

when it is issued as the positional coordinate data itself ,

a center of the position of the object is issued when the touch degree of the object is not greater than the predetermined degree and

an information is issued as a selection of positional coordinate when the touch degree is greater than the predetermined degree.

37. An information input apparatus comprising:

a housing arranged of a hand-held type or for supporting a hand;

proximity sensors for detecting direct touch or proximity of an object and producing a positional coordinate data of the object;

a tablet on which the proximity sensors are mounted;

thumb proximity sensors mounted on a side of the housing for detecting direct touch or proximity of and horizontal position of the object;

a touch degree judging means for determining that the touch of the object to the proximity sensors is greater than a predetermined degree;

a touch indicating means for indicating in a physical form a fact that the touch of the object to the proximity sensors is greater than the predetermined degree as determined by the touch degree judging means;

a data switching means for selecting whether a positional coordinate data of the object is directly issued or is issued with correspondence to key positions which are beforehand determined by a combination of position data of the other four fingers than the thumb and the horizontal position of the thumb determined by the thumb proximity sensors, in which

when it is issued with correspondence to the key positions ,

only the corresponding key code position is issued when the touch degree of the four fingers to the tablet is not greater than the predetermined degree and

a selected information of the key code is issued when the touch degree is greater than the predetermined degree, and

when it is issued as the positional coordinate data itself ,

a center of the position of the object is issued when the touch degree of the object is not greater than the predetermined degree and

an information is issued as a selection of positional coordinate when the touch degree is greater than the predetermined degree.

38. An information input apparatus according to claim 35, 36, or 37, wherein

the touch indicating means is provided with resilient members mounted to the tablet for producing a simulated click action upon being pressed by a force of more than a predetermined degree so that when the degree of the direct touch of the object exceeds the predetermined degree, it can physically be expressed, and

the touch degree judging means is arranged to detect the fact that the touch of the object is greater than the predetermined degree by measuring a sensor signal change according to the degree of the direct touch of the object or a secondary sensor signal change derived from the direct touch of the object , triggered by the real touch action.

39. An information input apparatus according to claim 38, wherein

a first resilient piece is provided in response to predetermined positions of the key on the tablet,

a second resilient piece is provided at a

predetermined boundary part of each key ,

a lock mechanism is linked to the second resilient piece for locking a face of the tablet, and

the lock mechanism locks the tablet when the positional coordinate data of the object is delivered in response to key position predetermined for the tablet and

the lock mechanism does not lock when the positional coordinate data itself is delivered .

40. An information input apparatus according to claim 37, wherein

the thumb proximity sensors is provided with a moving mechanism so that they can be moved forward and backward along a side of the housing and the distance of movement is adjustable with relation to a length of the thumb.

41. An information input apparatus according to claim 40, wherein

the moving mechanism is arranged detachable and can thus be attached to either a left or a right side of the housing.

42. An information input apparatus according to claim 37, wherein

the thumb proximity sensors are optical sensors, each comprising a light emitter region and a light receiver region and having a focusing lens for focusing light.

43. An information input apparatus according to claim 37, wherein

the thumb proximity sensor has at least two different types of hysteresis characteristic which are selectable with a selector means so that

when one of the two hysteresis types is selected, the distance between the thumb and a thumb proximity sensor when the thumb proximity sensor turns firstly OFF from ON state by an approaching thumb , is smaller than the distance between the thumb and a thumb proximity sensor when the thumb proximity sensor turns firstly ON from OFF state by an leaving thumb , and

when the other hysteresis is selected, the characteristic is reversed.

44. An information input apparatus according to claim 37, wherein

when the object moves towards a thumb proximity sensor,

a horizontal direction selection position which is given when a proximity degree exceeding the predetermined degree is detected at the horizontal direction selection position , is delivered, and

when the object departs from the thumb proximity sensor,

a horizontal direction selection position which is given when the degree becomes lower than a predetermined degree , is maintained.

45. An information input apparatus according to claim 37, wherein

when the object moves towards a thumb proximity sensor, a forward and backward direction selection is measured together with the horizontal direction selection .

46. An information input apparatus comprising:

a tablet having i-directional electrodes and j-directional electrodes which are insulated to each other;

a conductive object coordinate acquisition means for detecting direct touch or proximity of an object to the i-directional or j-directional electrode and producing a coordinate data of the object on the tablet through scanning; and

a coordinate conversion data output means for converting the coordinate data produced by the coordinate acquisition means to an orthogonal coordinate data in another coordinate determined by X and Y directions on the tablet and delivering it.

47. An information input apparatus comprising:

a thin film with flexibility;

a perforated plate bonded to a lower surface of the thin film;

key tops movably fitted into apertures of the perforated plate respectively;

a lock/resiliency selector drive mechanism for locking the key tops in their respective apertures ,thereby closing the apertures to flatness or for lifting up the key tops in the apertures to raise the thin film so that the key tops can be pressed in through a resiliency of the thin film; and

an object coordinate acquisition means for detecting direct touch or proximity of an object , provided to the thin film and producing a coordinate data of the object on the thin film by scanning.

48. An information input apparatus comprising:

a housing provided with a drive mechanism which can move upward and downward or with free rotating motion;

a set of a light receiver, a light emitter, and an optical system mounted to the drive mecha-

nism;

a drive system position detecting means for detecting a position of the drive mechanism;

a communications circuit means for communicating

by detecting a predetermined signal system from outputs of the light receiver and

by driving the light emitter with inputted any informations under a predetermined signal system ; and

a direction controlling means for controlling the drive mechanism so that an output of the light receiver becomes optimum corresponding to irradiation of light from an external light source actuated by a predetermined signal system and simultaneously, making a path of communications from the light emitter to an external light receiver, in which

after the optical system in the housing is faced towards the external light source by an operator, a desired data is issued from the communications circuit means while a particular data about a direction of the housing relative to the external light source detected by the drive system position detecting means is transmitted as a pointing data to the external light source.

49. An information input apparatus according to claim 48, further comprising

an installation state detecting means for examining whether or not the housing is placed on a base and

a means for inverting a positive or negative sign of a quantity of a upward or downward movement .

50. An information input apparatus according to claim 48, wherein

with the optical system facing the external light source, sorts of information attributed to equipments linked to external optical receiving/transmitting device or to the housing can be communicated to each other to carry out initial communications through optical links.

51. An information input apparatus according to claim 48, wherein

the drive mechanism movable vertically or rotatable in all directions has another optical system for measuring a distance from the external light source, thus

allowing data of the distance between the housing and the external light source to be transmitted along with directional data of the housing.

52. A coordinate data input apparatus comprising:

stripes of resistors mounted on a tablet;

a current applying means for applying to the striped resistors a current including alternate current components;

an insulator layer for insulating the striped resistors; and

a current measuring means for measuring a current running across the striped resistors, in which

a coordinate data along a major axis of the striped resistors is given by measuring with the current measuring means a change in the current caused by that the alternate current components of the applied current by-passes a part of the striped resistor and flows through an earth capacitance of an object which moves towards the insulator layer, and

a coordinate data along a minor axis of the striped resistors is given by measuring a change in the current applied to a specific one of the striped resistors or a difference of the current between two adjacent striped resistors.

53. A coordinate data input apparatus according to claim 52, wherein

the striped resistors are grouped into M, each comprising N of near striped resistors,

the current applying means is arranged to apply the current including alternate components to the entire or part of N of the striped resistors in any of M at substantially the same time, and

the current measuring means is disposed on a downstream side of the striped resistors, while the current flowing from upstream to downstream, for measuring a current flown across each of the N striped resistors of each group.

54. A coordinate data input apparatus according to claim 52, wherein

the striped resistors are grouped into M, each comprising N of the near striped resistors,

the current applying means is arranged to apply the current including alternate components to the entire or part of N of the striped resistors in any of M at substantially the same time, and

the current measuring means is disposed on a downstream side of the striped resistors, while the current flowing from upstream to downstream, for measuring a difference between currents flown across neighboring striped resistors in each group .

55. A coordinate data input apparatus according to claim 53, wherein

the current measuring means has a switching circuit for selecting a current flown across a desired one of the N striped resistors and a diode for preventing the current from returning to N-1 of the other striped resistors which are not selected by the switching circuit.

56. An information input apparatus comprising:

a coordinate position sensor having a degree of resolution for detecting one finger in a direction parallel to the finger length and another degree of resolution for identifying fingers in a direction at a right angle to the finger length so that it is utilized to enter directly a coordinate data of the position of the finger or a data assigned to a region corresponding to the coordinate data in a sensing area of the coordinate position sensor.

57. An information input apparatus according to claim 56, wherein

the position of a desired one of the fingers is identified by a distance in at least one direction on a plane of tablet upon which the finger touch.

58. An information input apparatus according to claim 56, wherein

a threshold is used to determine whether the direct touch to the tablet is made with a pen or a finger by examining a ratio of the distances in at least one direction on a touch plane of a tablet.

59. An information input apparatus according to claim 56, wherein

the coordinate position sensor has proximity electrodes for detecting a pressure given on the sensor.

60. An information input apparatus according to claim 56 or 57, wherein

the coordinate position sensor has a degree of resolution which is higher in the direction at a right angle to the finger length than a size of a touch surface of the finger with respect to at least a widthwise direction of the touch surface of the finger and is provide with a means for predicting positions of the fingers extending in the right angle direction by examining the relation between the touch width of the finger and the detected finger position in the direction parallel to the finger length.

61. An information input apparatus comprising:

a coordinate data input tablet having a recess provided in a center thereof for entering a coordinate data;

a pressure sensor for detecting at least two directional pressures; and

a means for transmitting the pressure of an object against an inner edge of the coordinate data input tablet to the pressure sensor, in which

a position pointing in a certain area on a screen is indicated by a coordinate data of the coordinate data input tablet and a movement of the certain area on the screen is carried out using a coordinate data on the screen determined by the pressure.

62. An information input apparatus comprising:

a coordinate data input tablet for entering a coordinate data; and

a pressure sensor mounted around the coordinate data input tablet for detecting a movement of the coordinate data input tablet by measuring at least two directional pressures, in which

a position pointing in a certain area on a screen is indicated by a coordinate data on the coordinate data input tablet and a movement of the certain area on the screen is carried out using a coordinate data on the screen determined by the pressure.

63. An information input apparatus according to claim 61, wherein

the pressure of the object against the inner edge of the coordinate data input tablet is detected as divided into two, horizontal and vertical, components by using a curvature or friction of the inner edge of the coordinate data input tablet.

64. An information input apparatus according to any one of claims 1, 2, 5, 6, 13, 14, 19, 20, 22, 24, 25, 26, and 27, further comprising

a coordinate position sensor having a degree of resolution for detecting one finger in a direction parallel to the finger length and another degree of resolution for identifying fingers in a direction at a right angle to the finger length so that it is utilized to enter directly a coordinate data of the position of the finger or to enter a data assigned to a region on the coordinate position sensor, and thus

allowing at least some of the switch circuits and the keys for opening and closing by transmission of forces to the switch circuits ,to be replaced with an input action of the data of the region of the coordinate position sensor.

Fig. 1

1 keytop

2 key switch

3 electrode

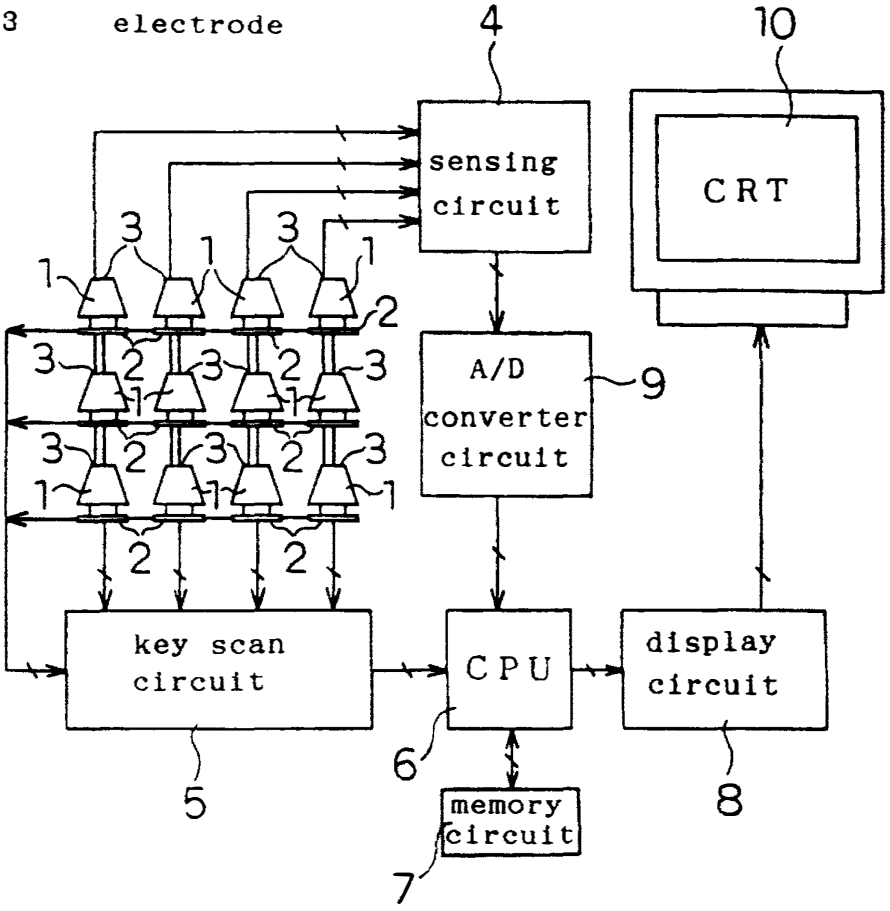


Fig. 2

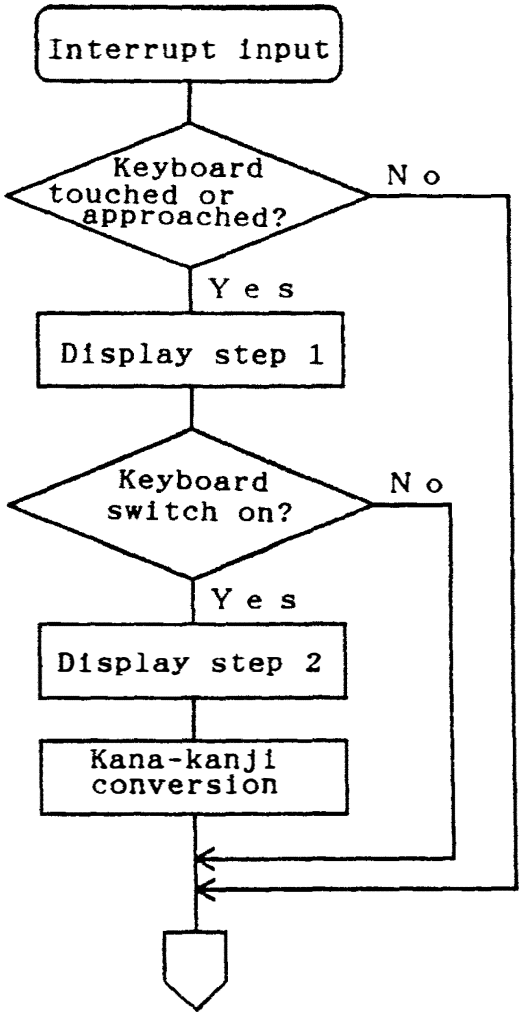


Fig. 3

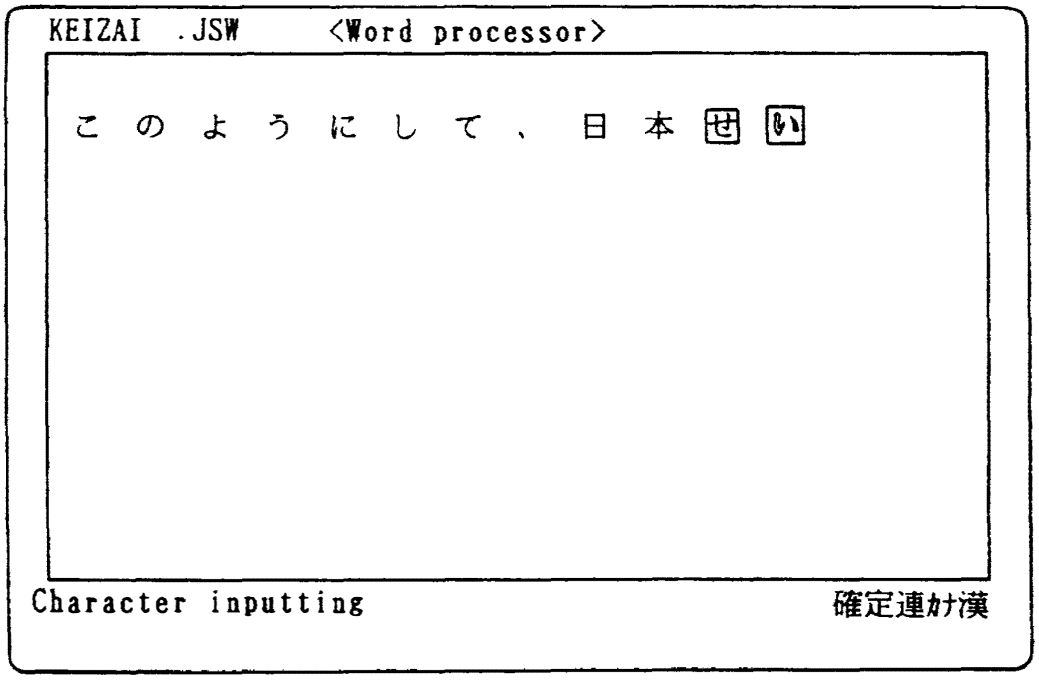
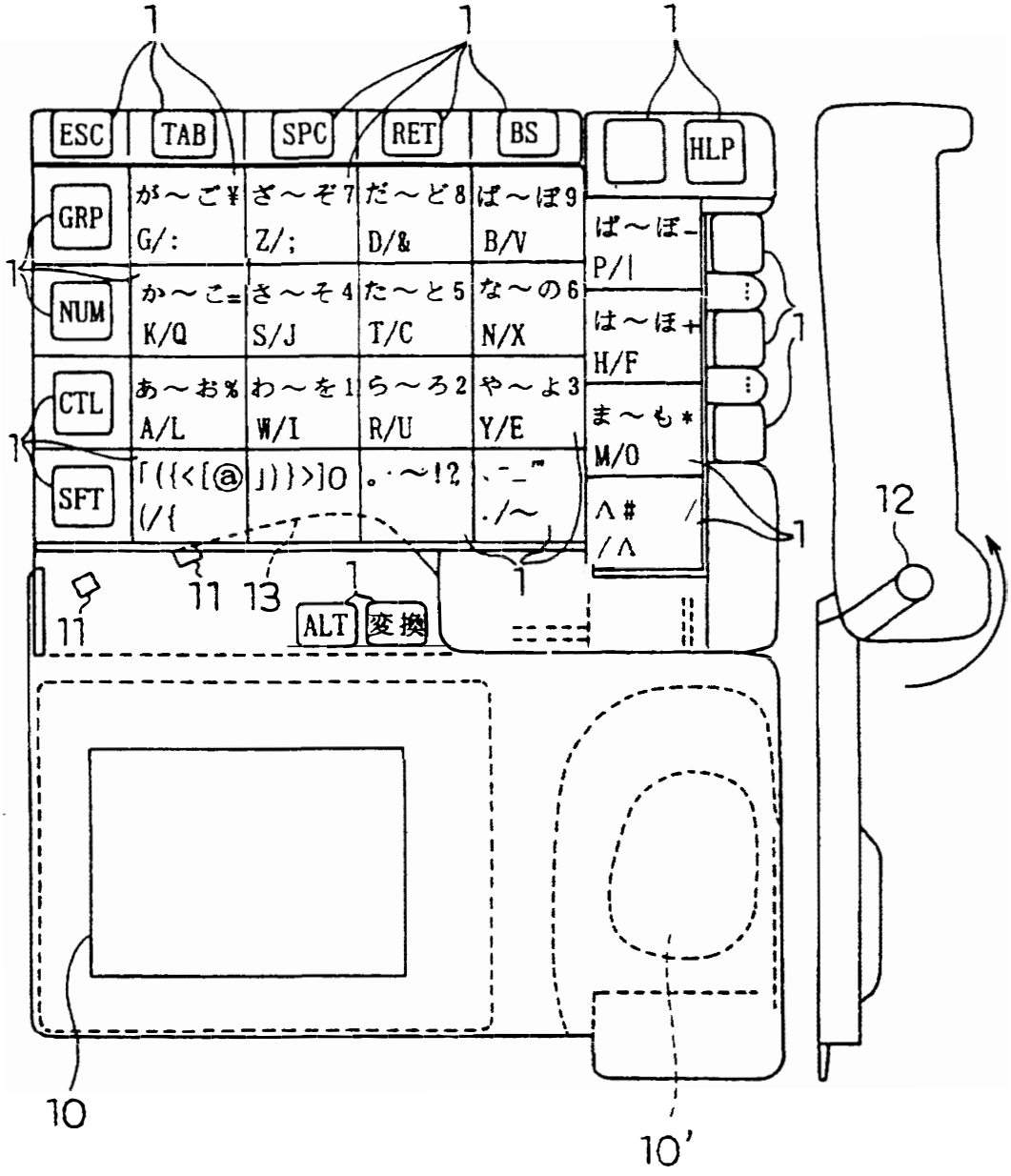


Fig. 4

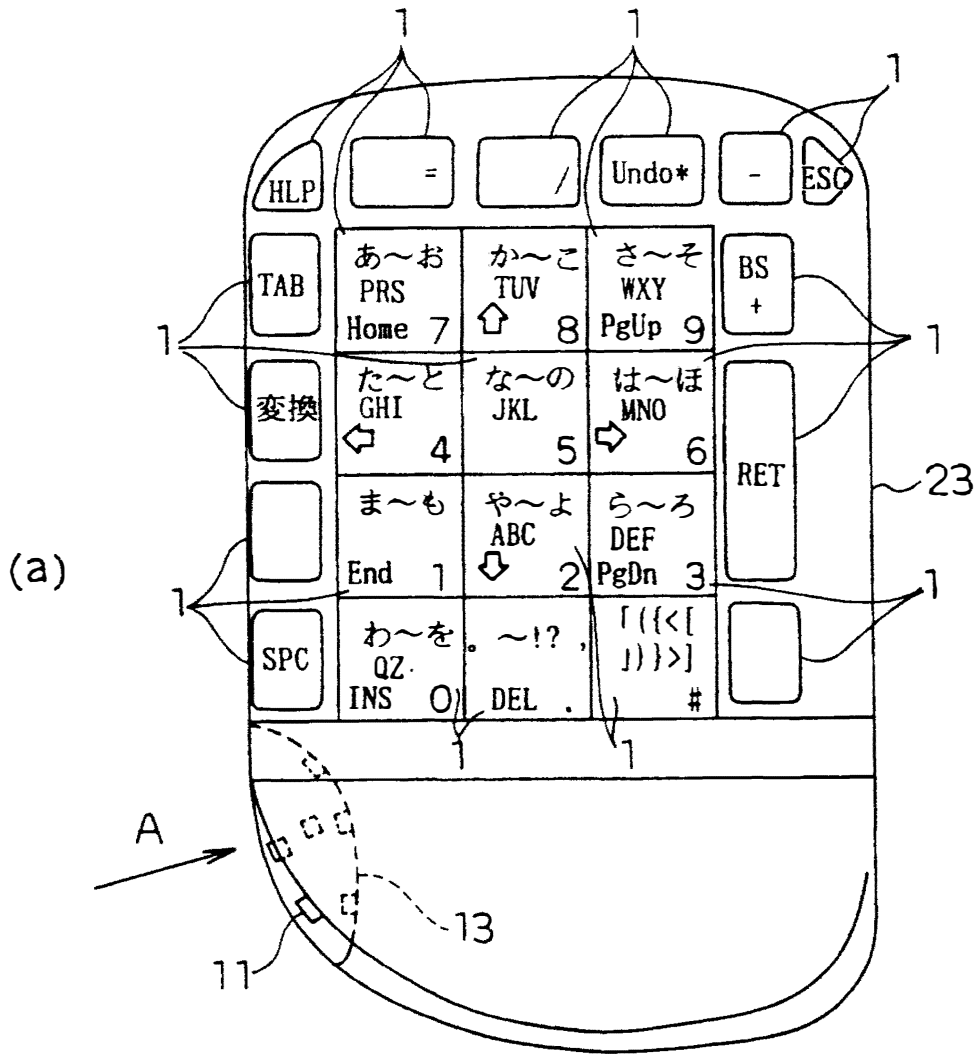


1 1 photosensor

1 3 thumb insertion hole

Fig. 5

(a)



2 3 housing

(b)

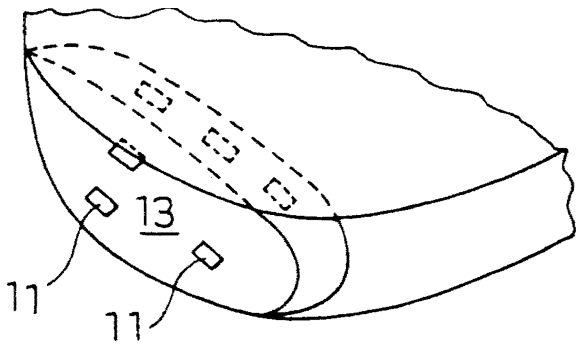


Fig. 6

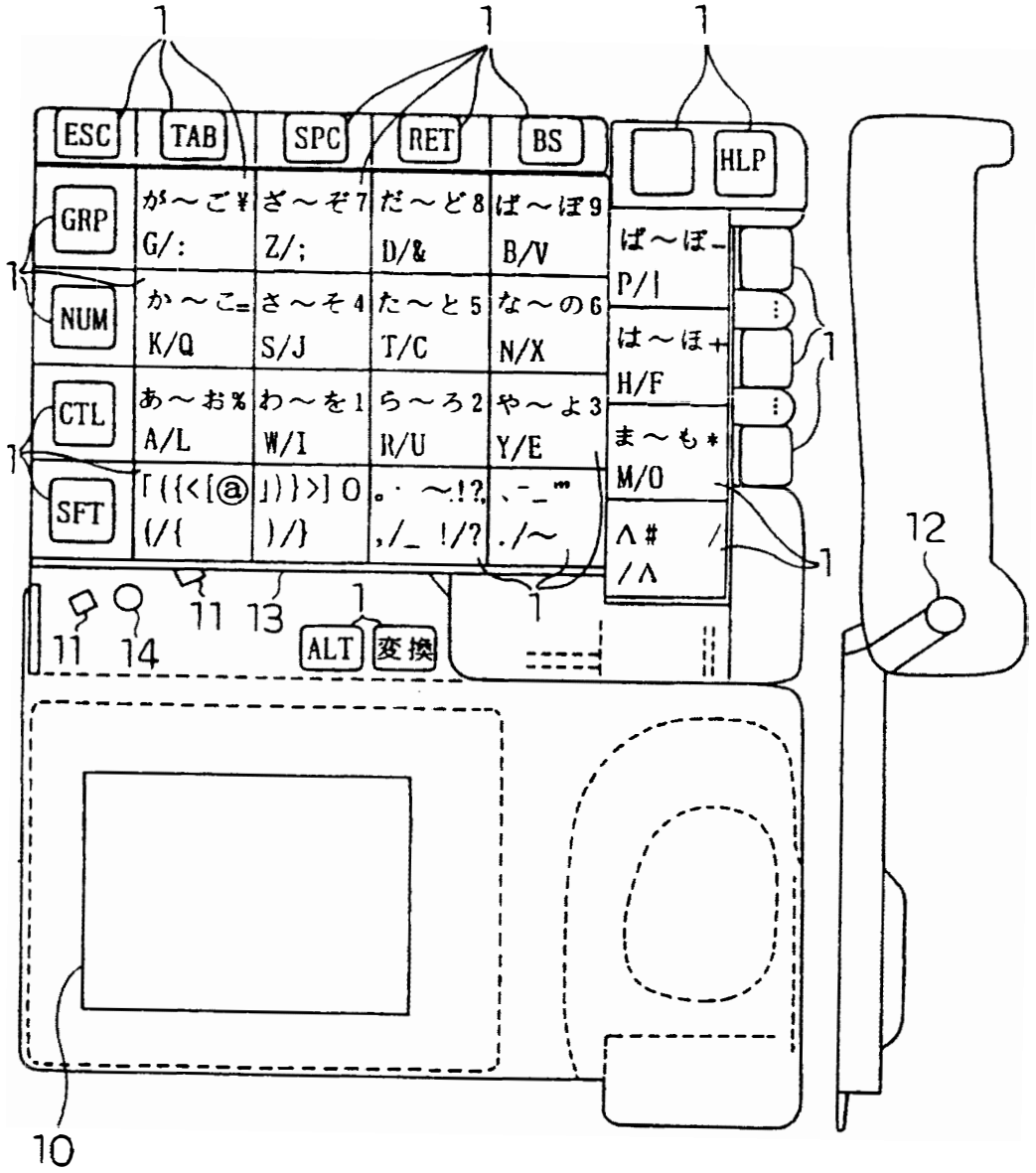


Fig. 7

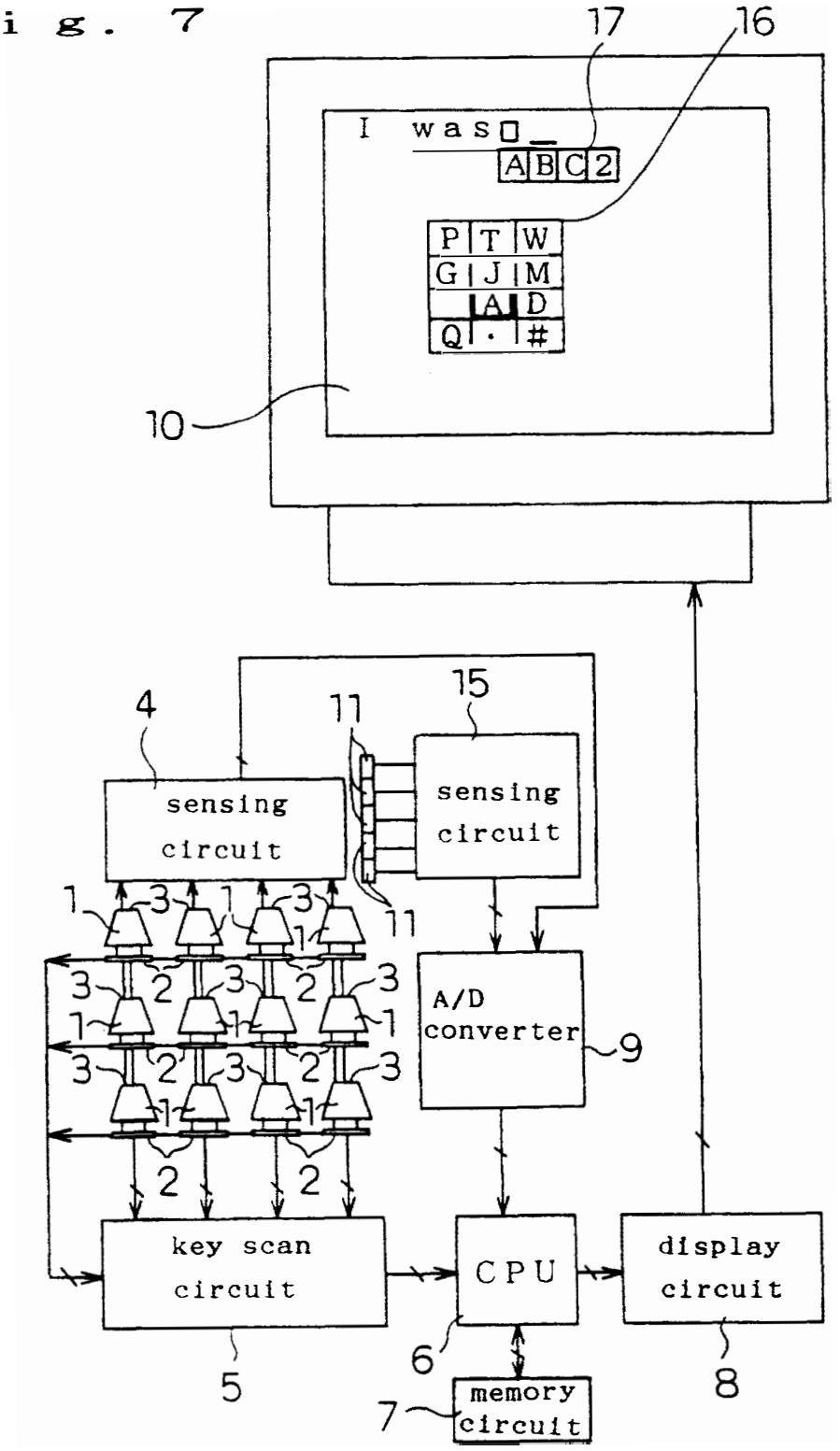


Fig. 8

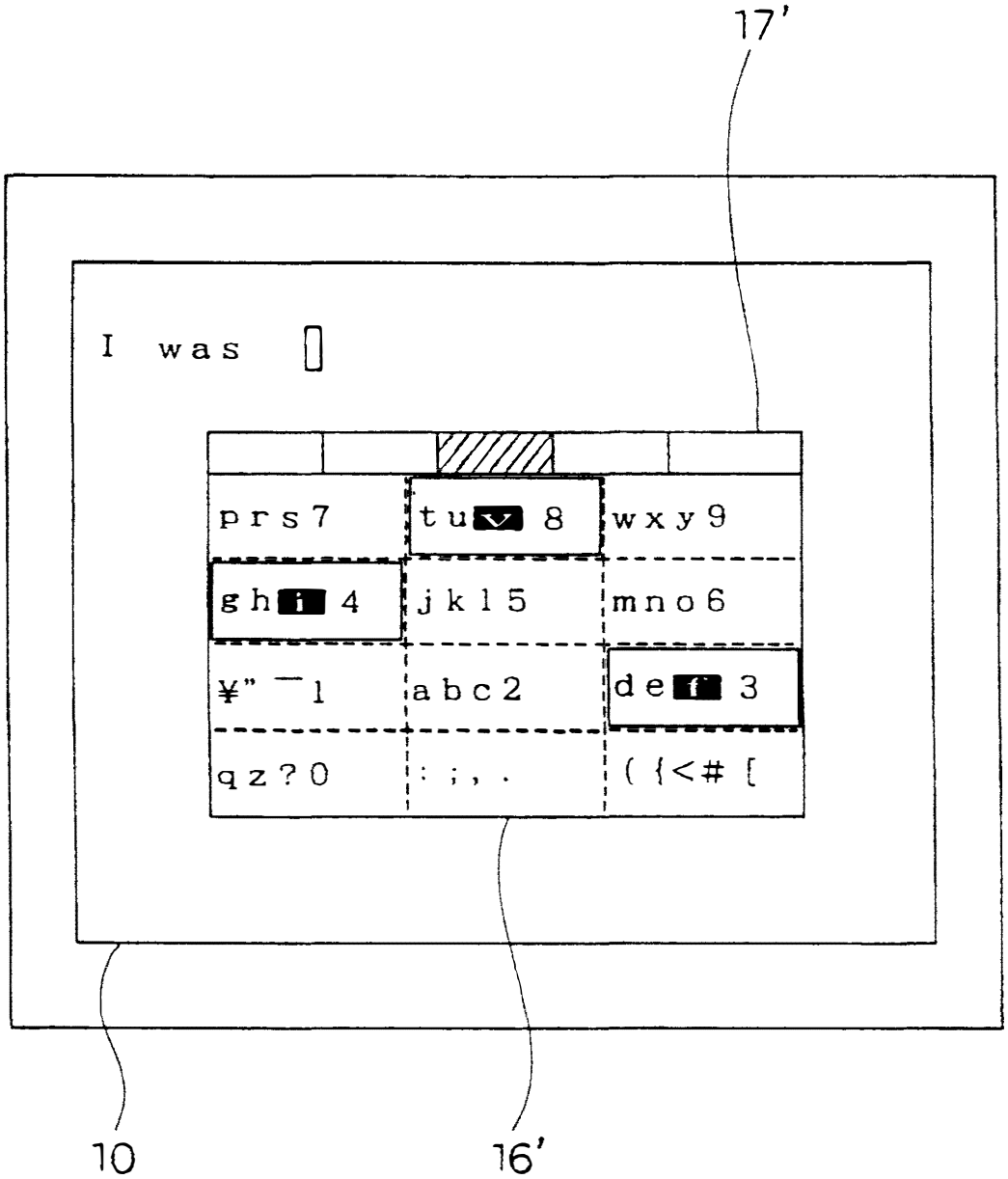


Fig. 9

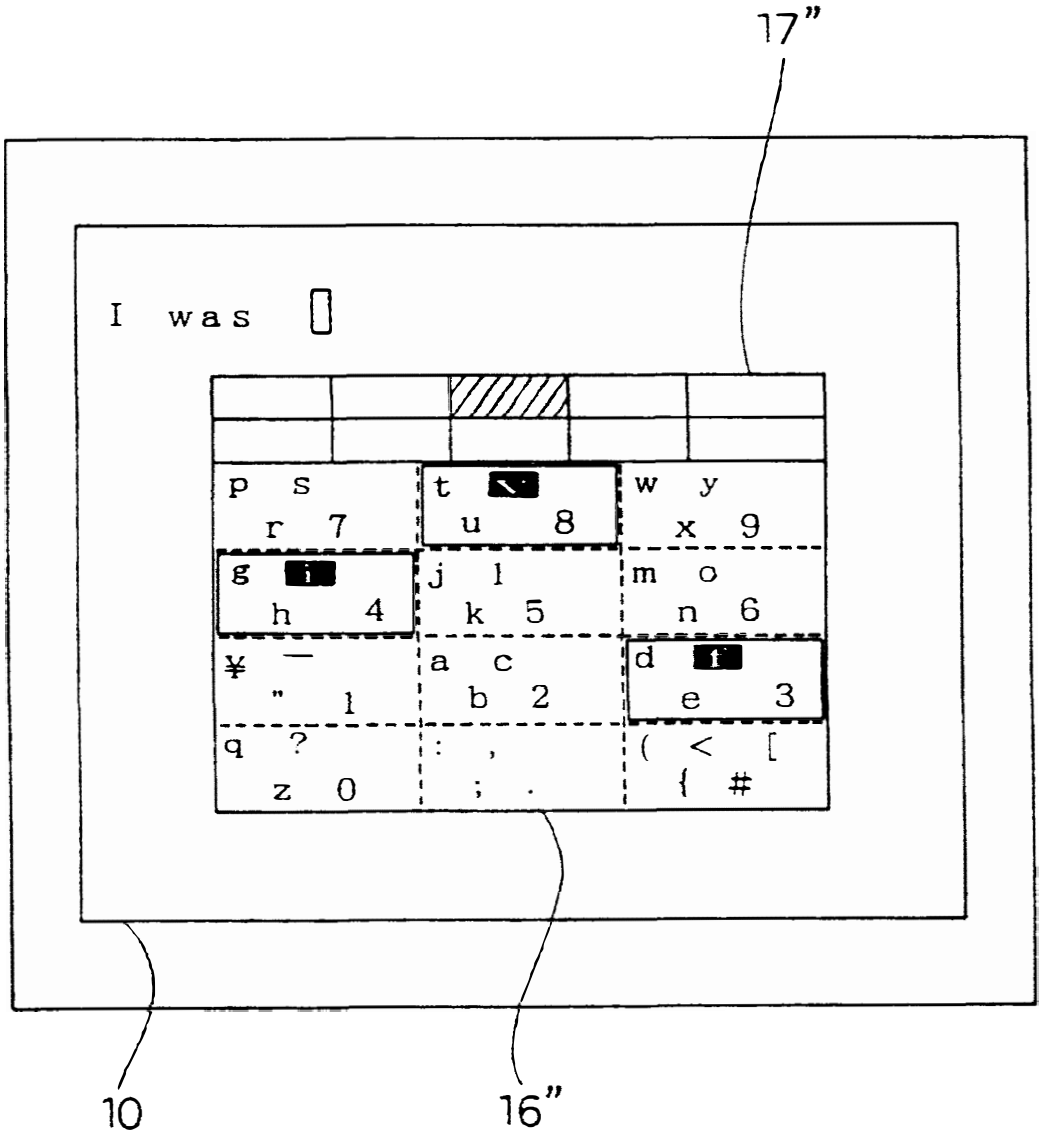


Fig. 10

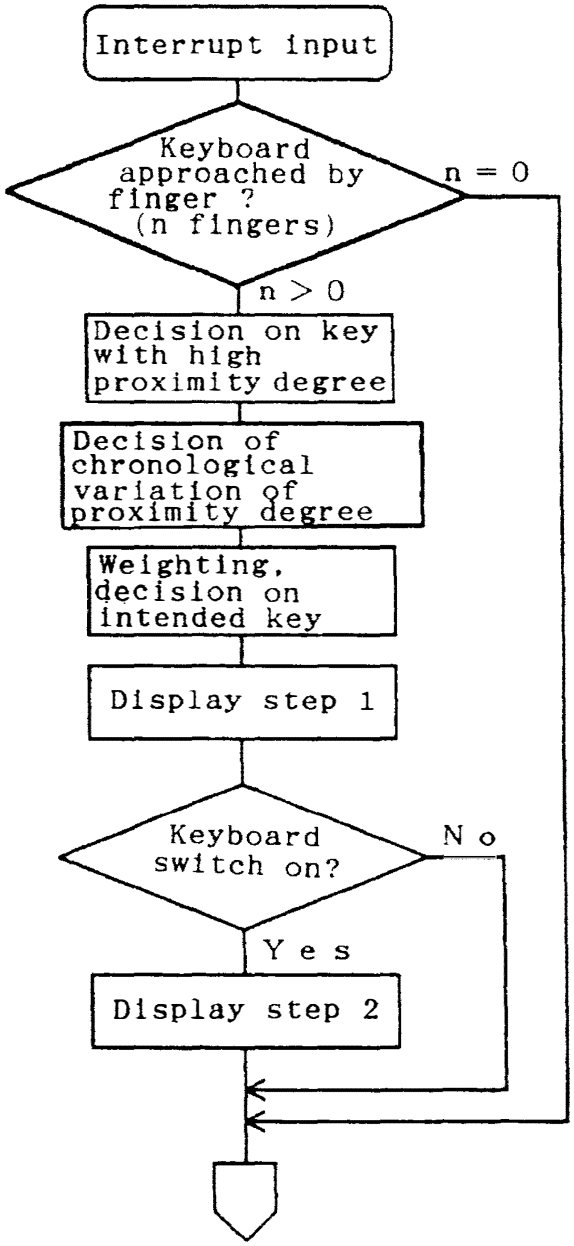


Fig. 11

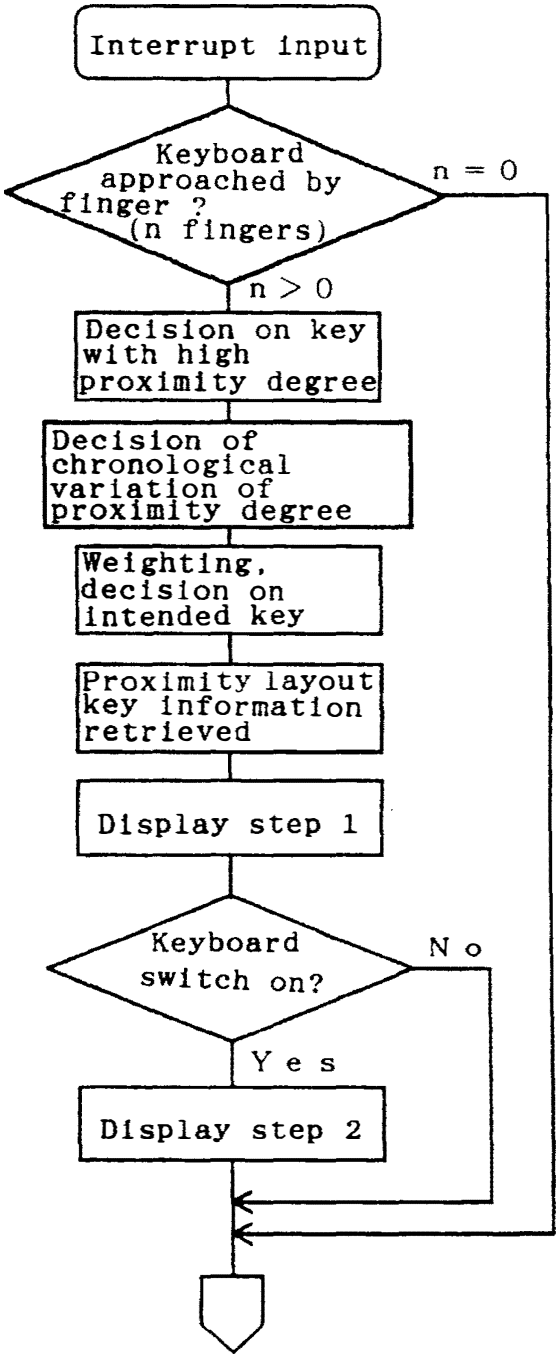


Fig. 12

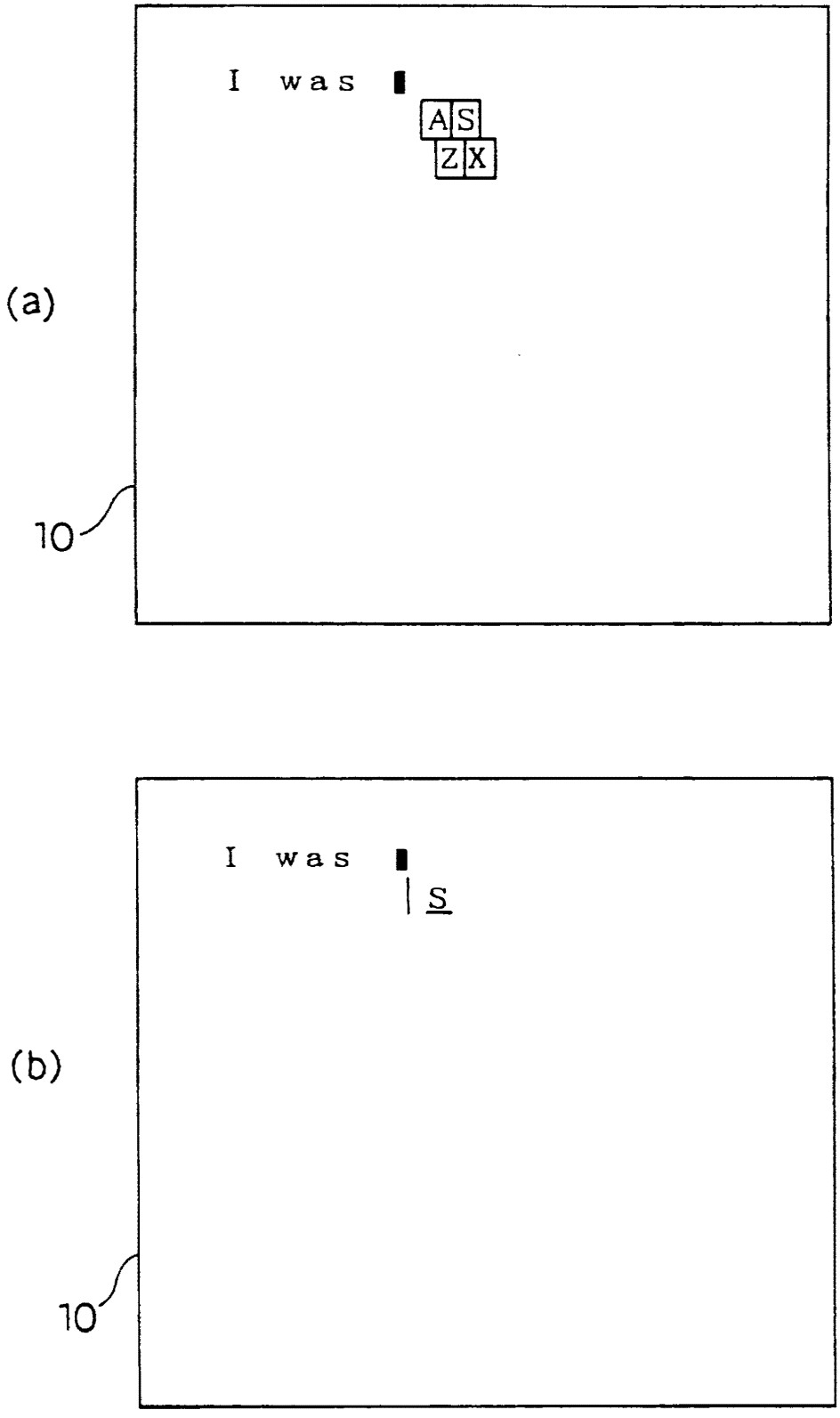


Fig. 13

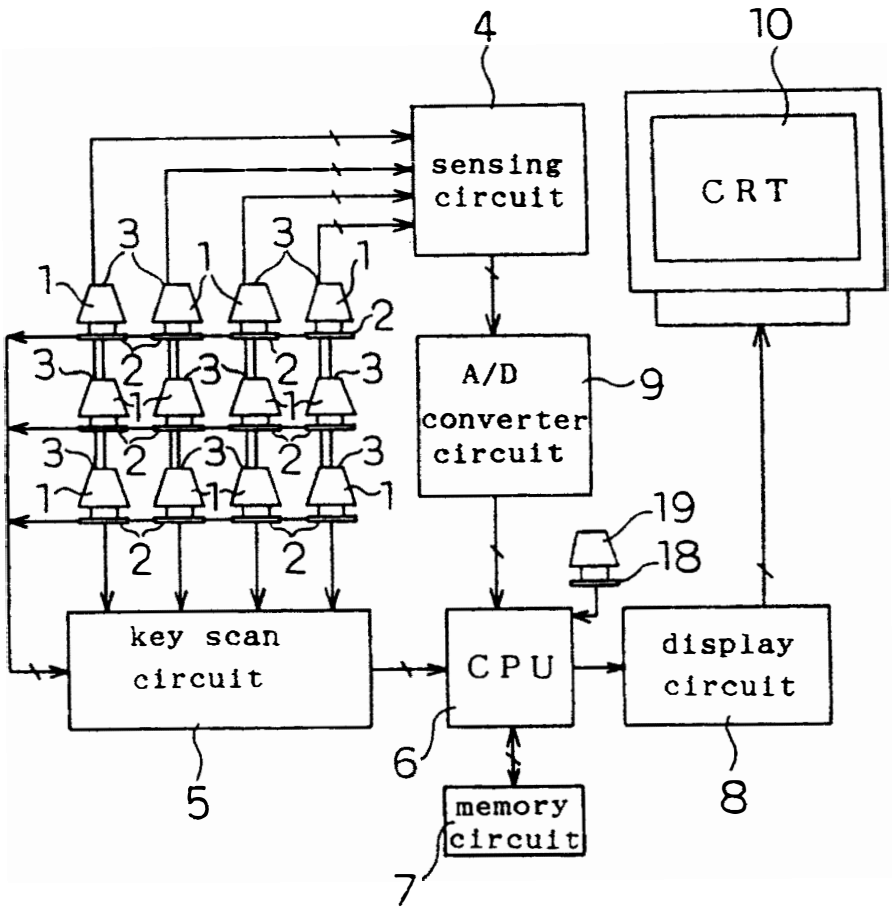


Fig. 14

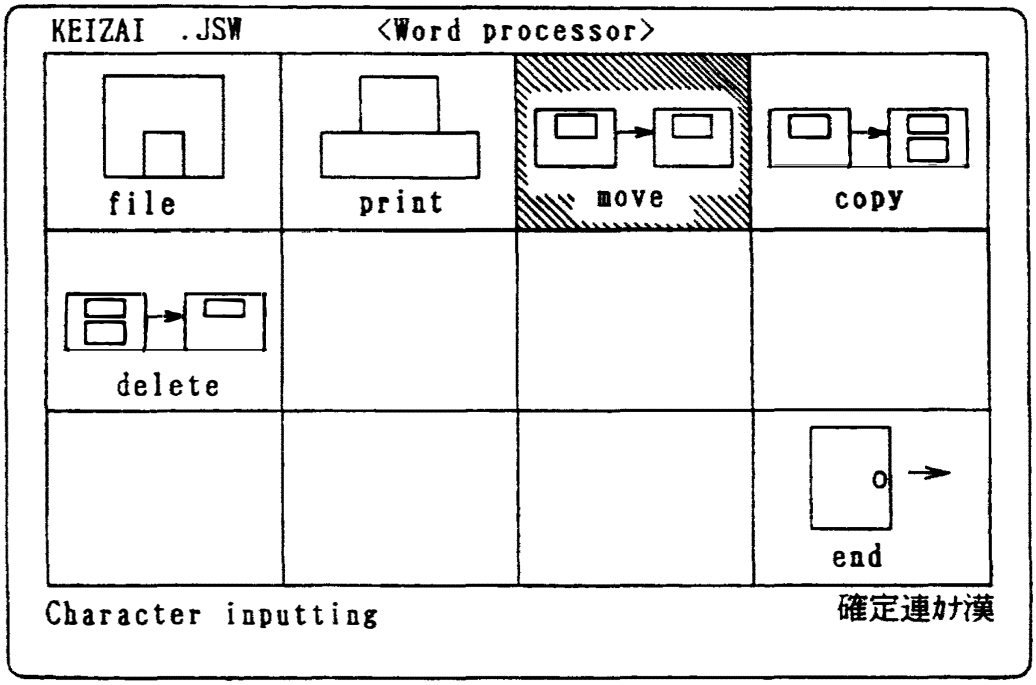


Fig. 15

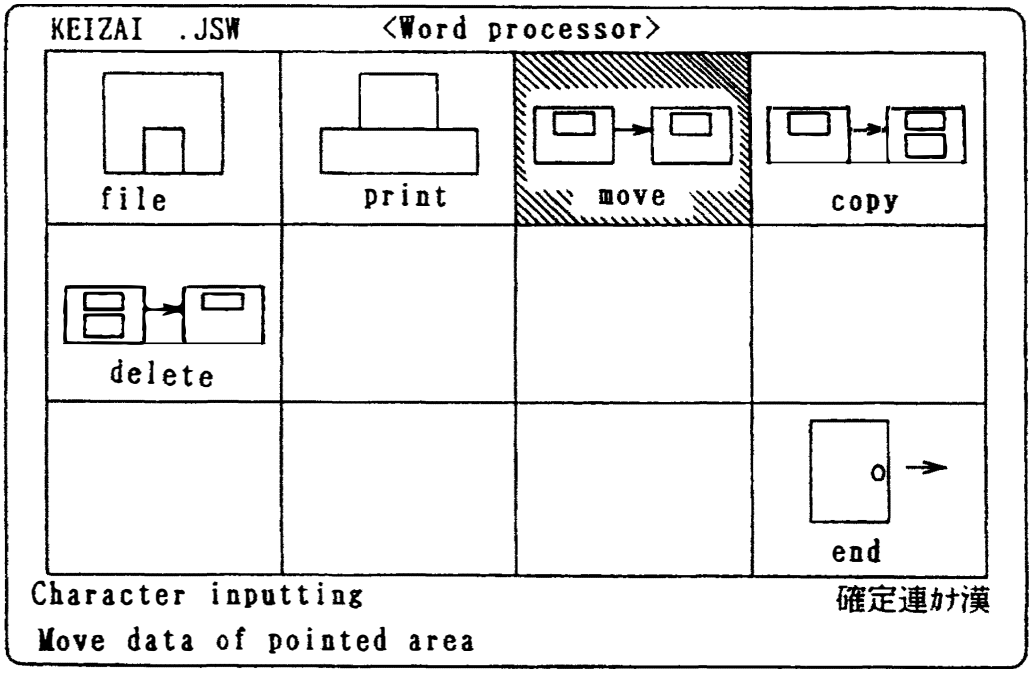


Fig. 16

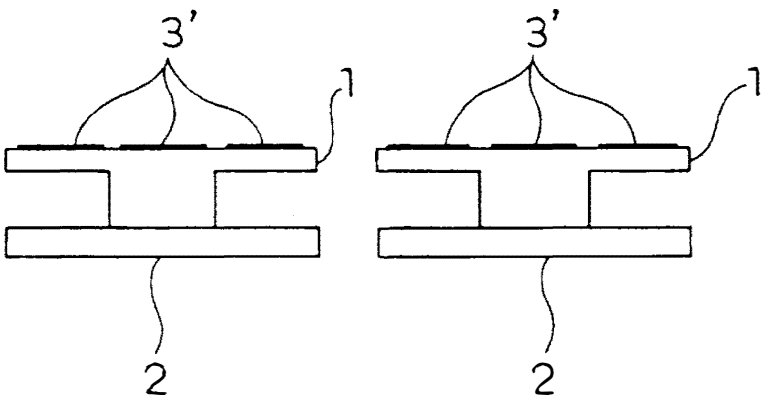


Fig. 17

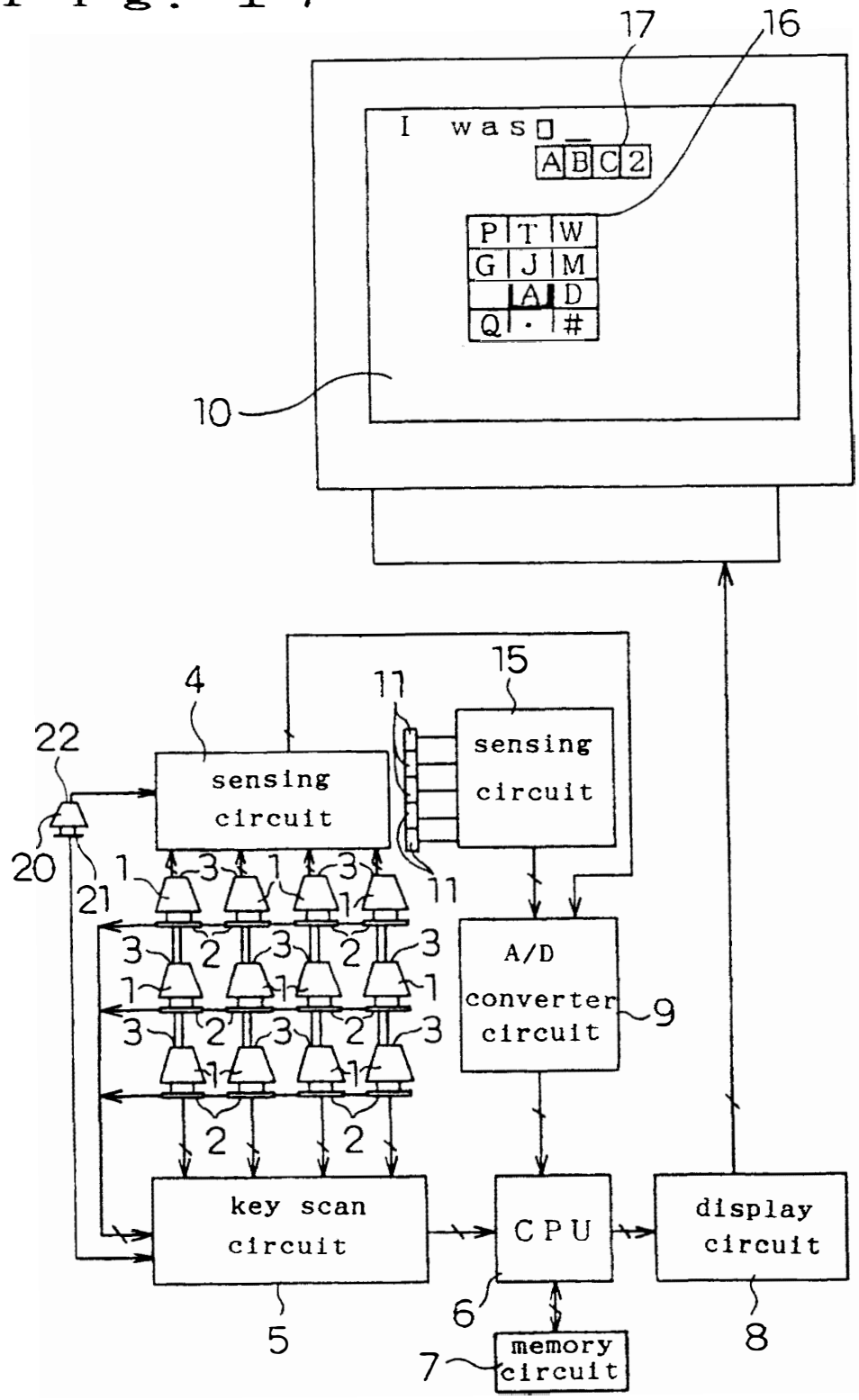
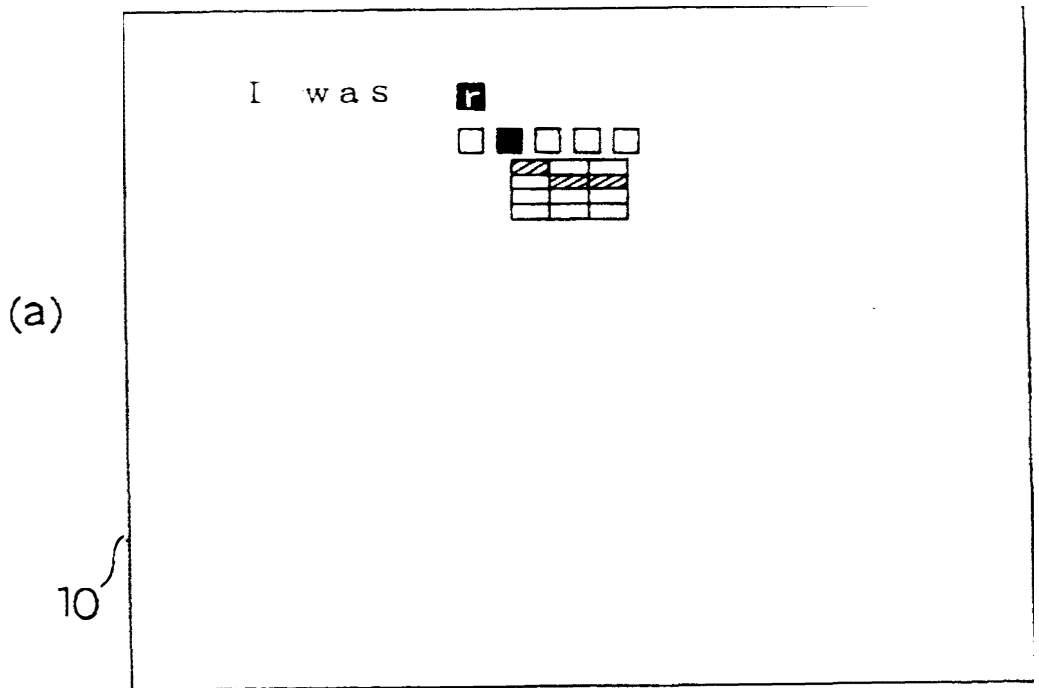


Fig. 18



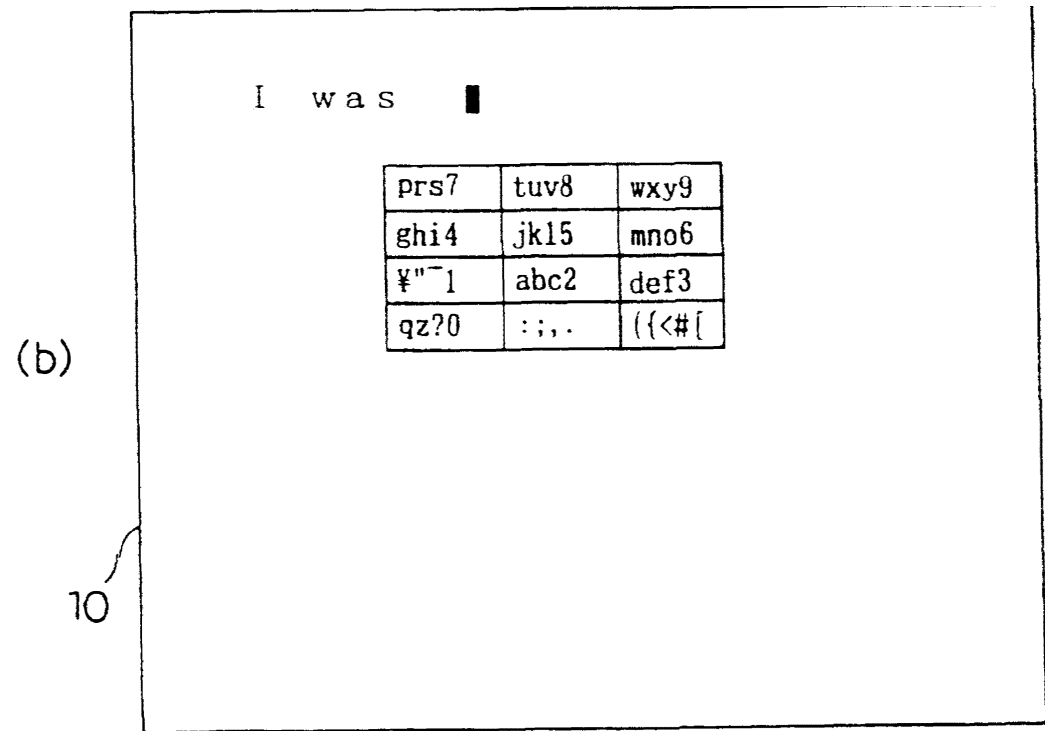
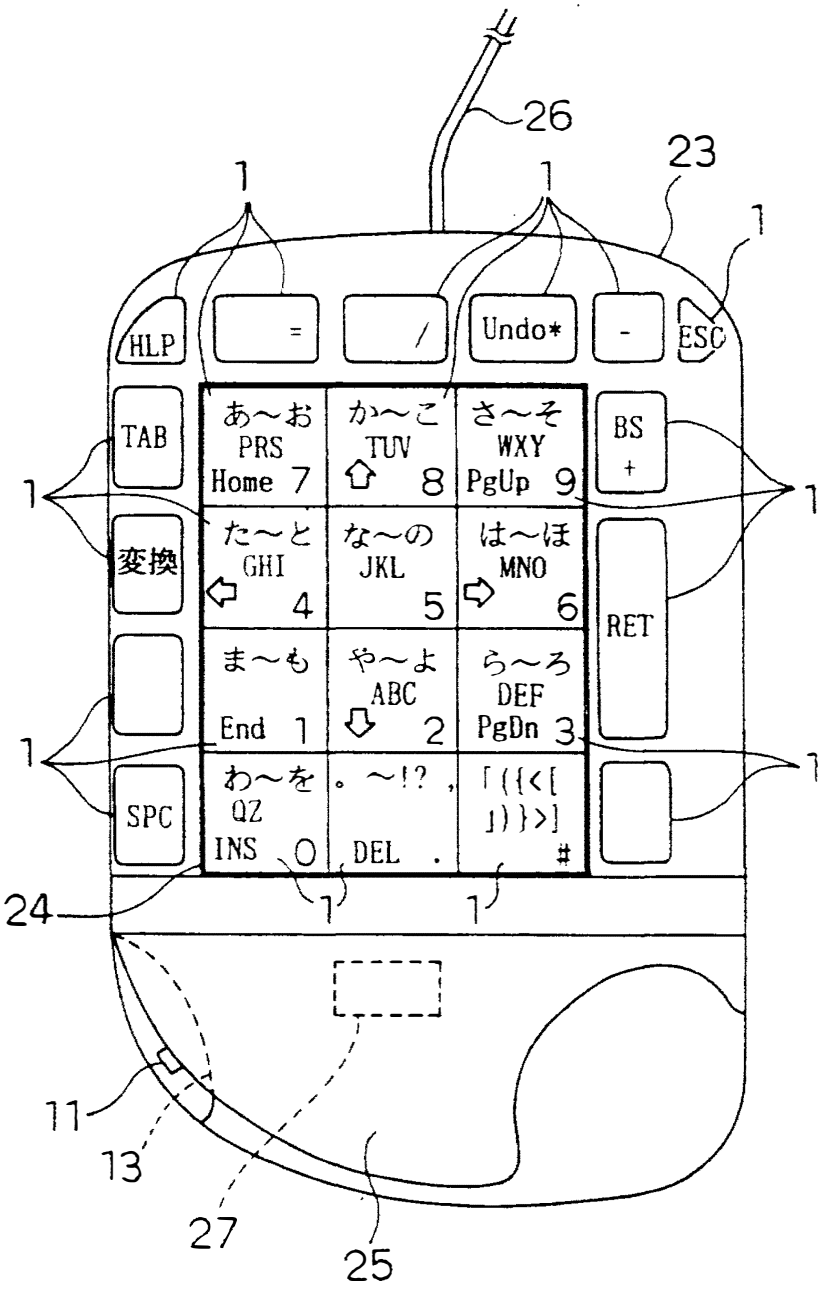


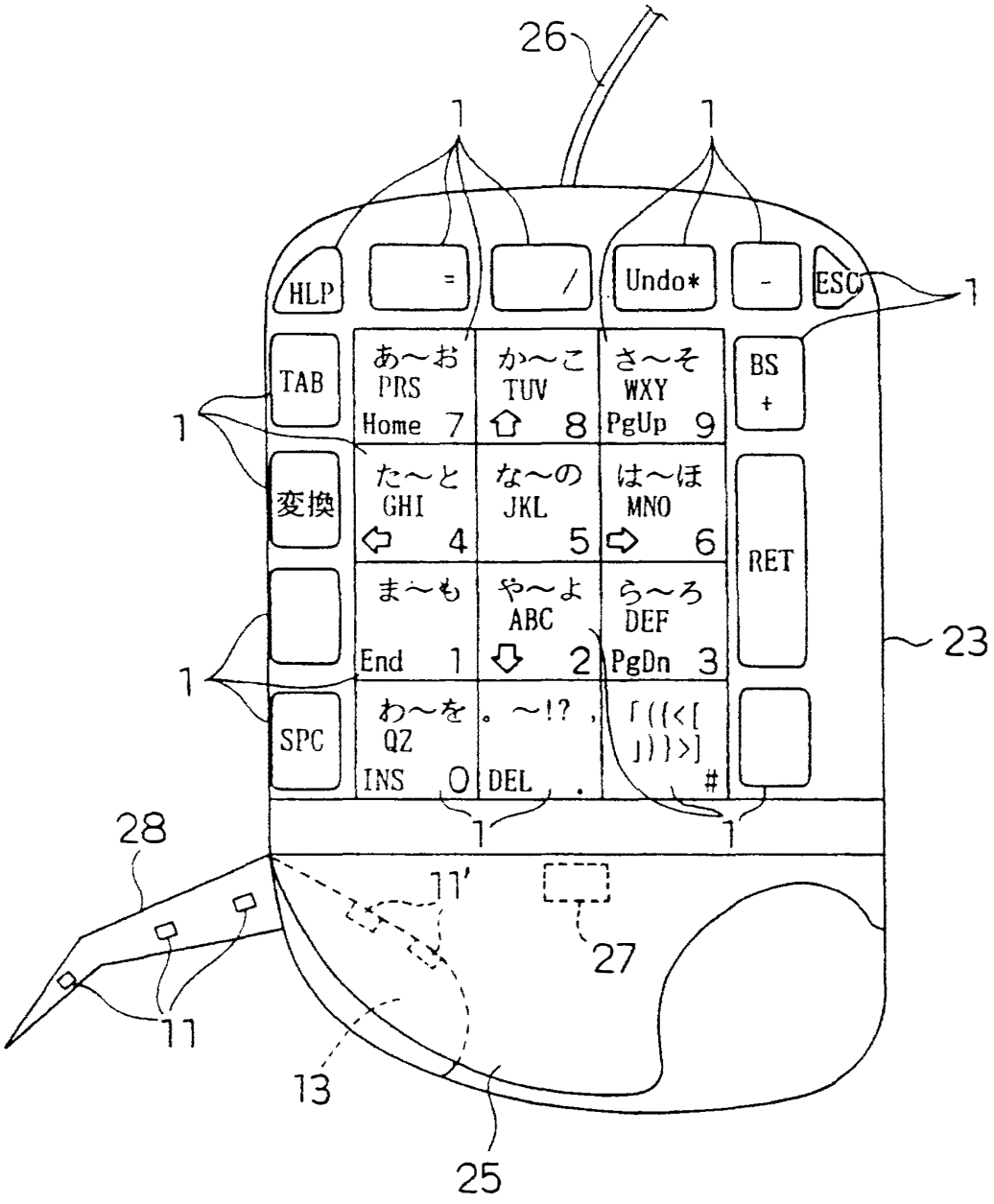
Fig. 19



25 palm rest

27 switch

Fig. 20



28 accommodable tongue

Fig. 21

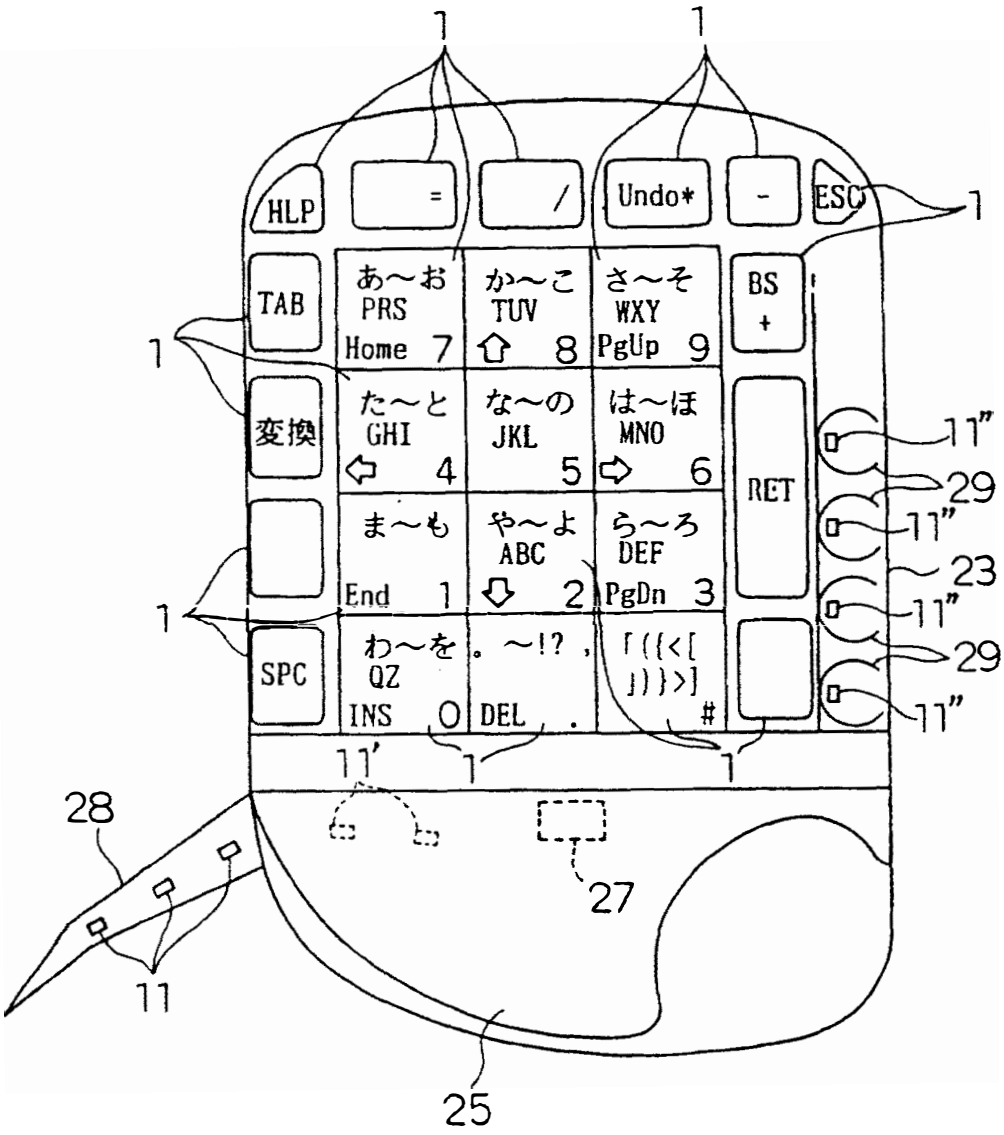
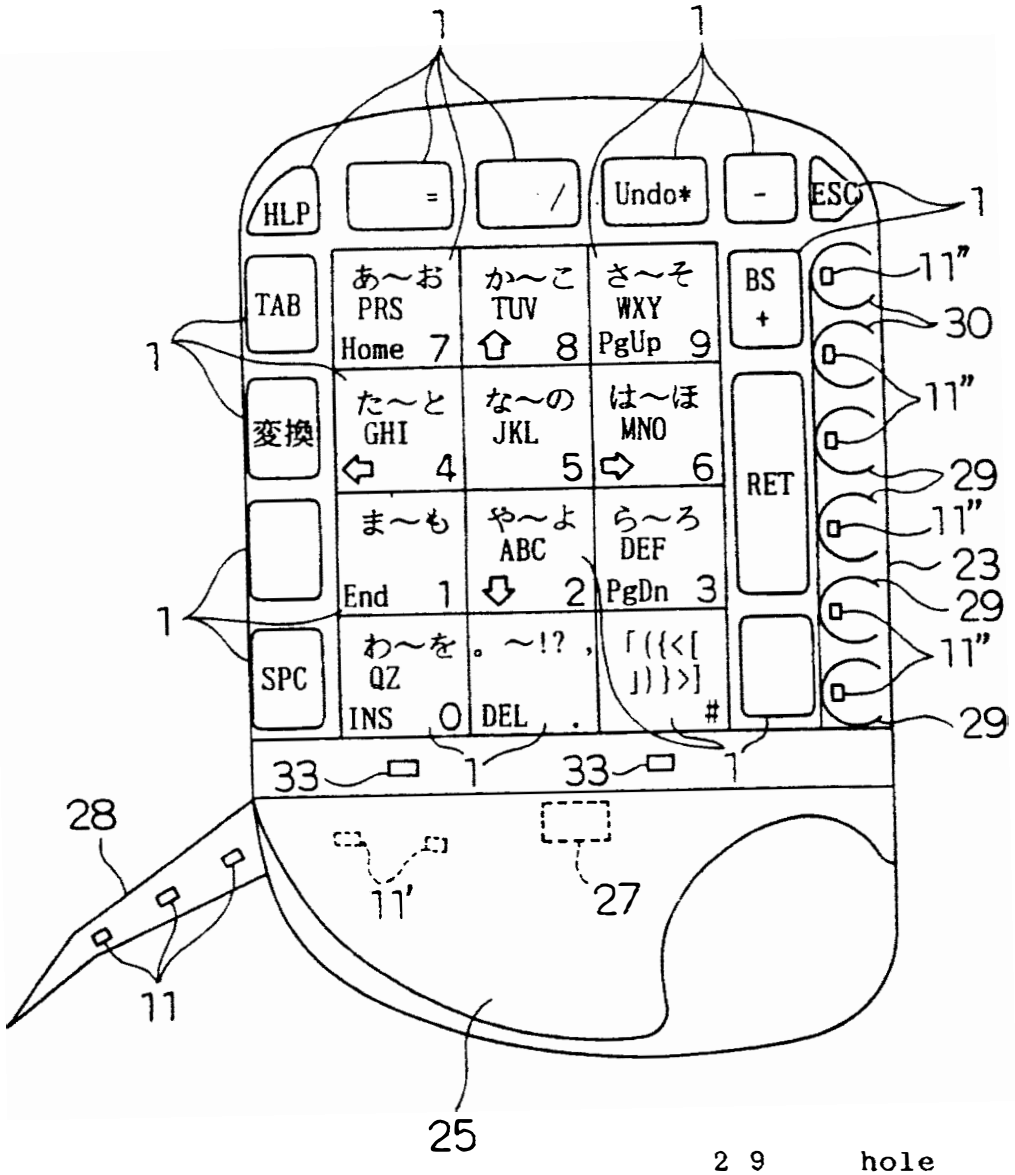


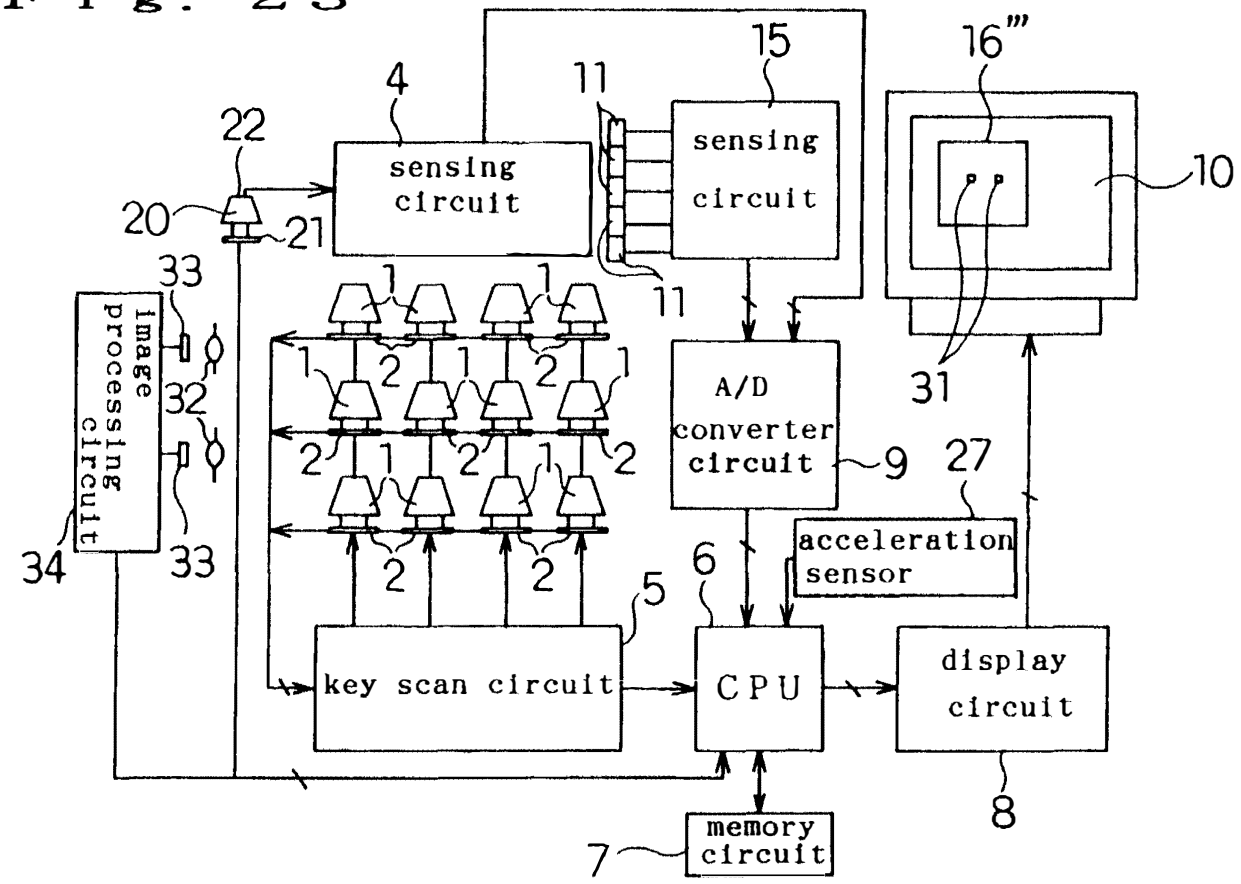
Fig. 22



29 hole

30 hole

Fig. 23



EP 0 689 122 A1

Fig. 24

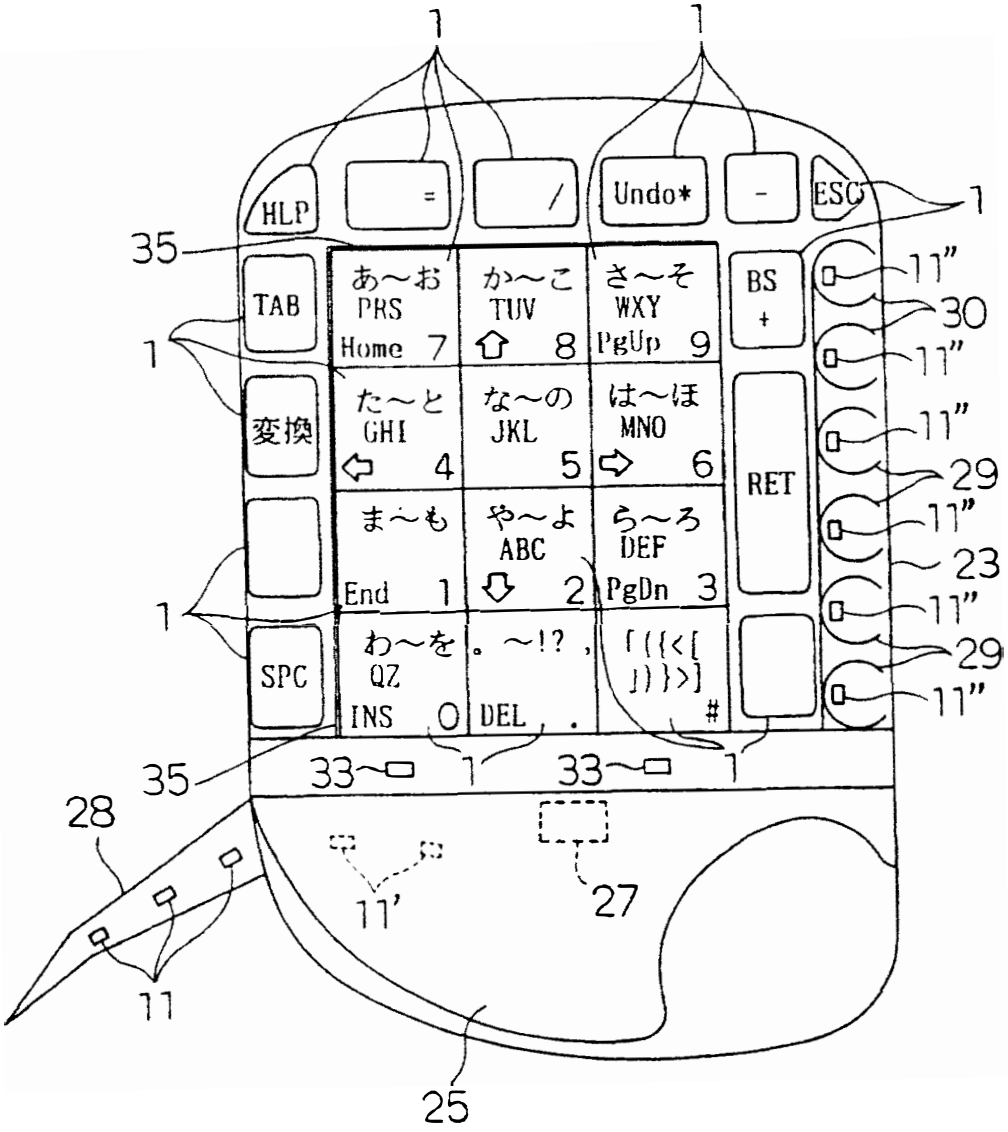


Fig. 25

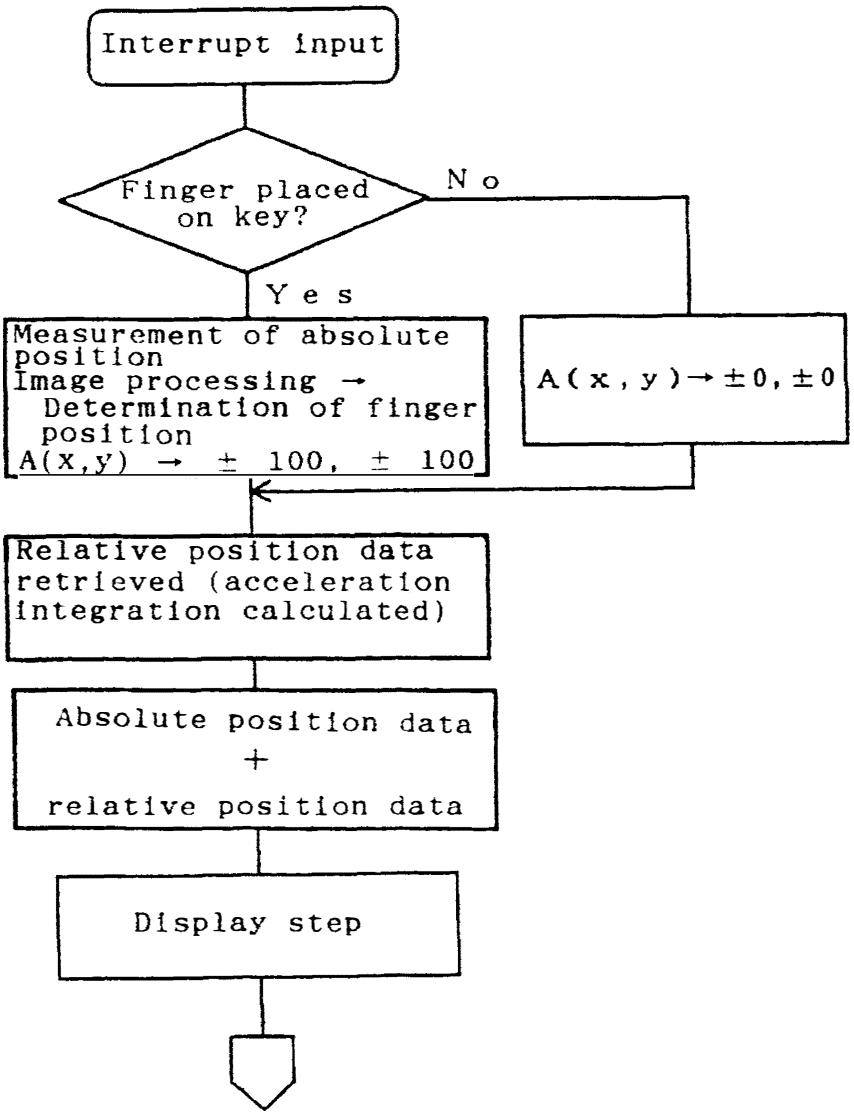


Fig. 26

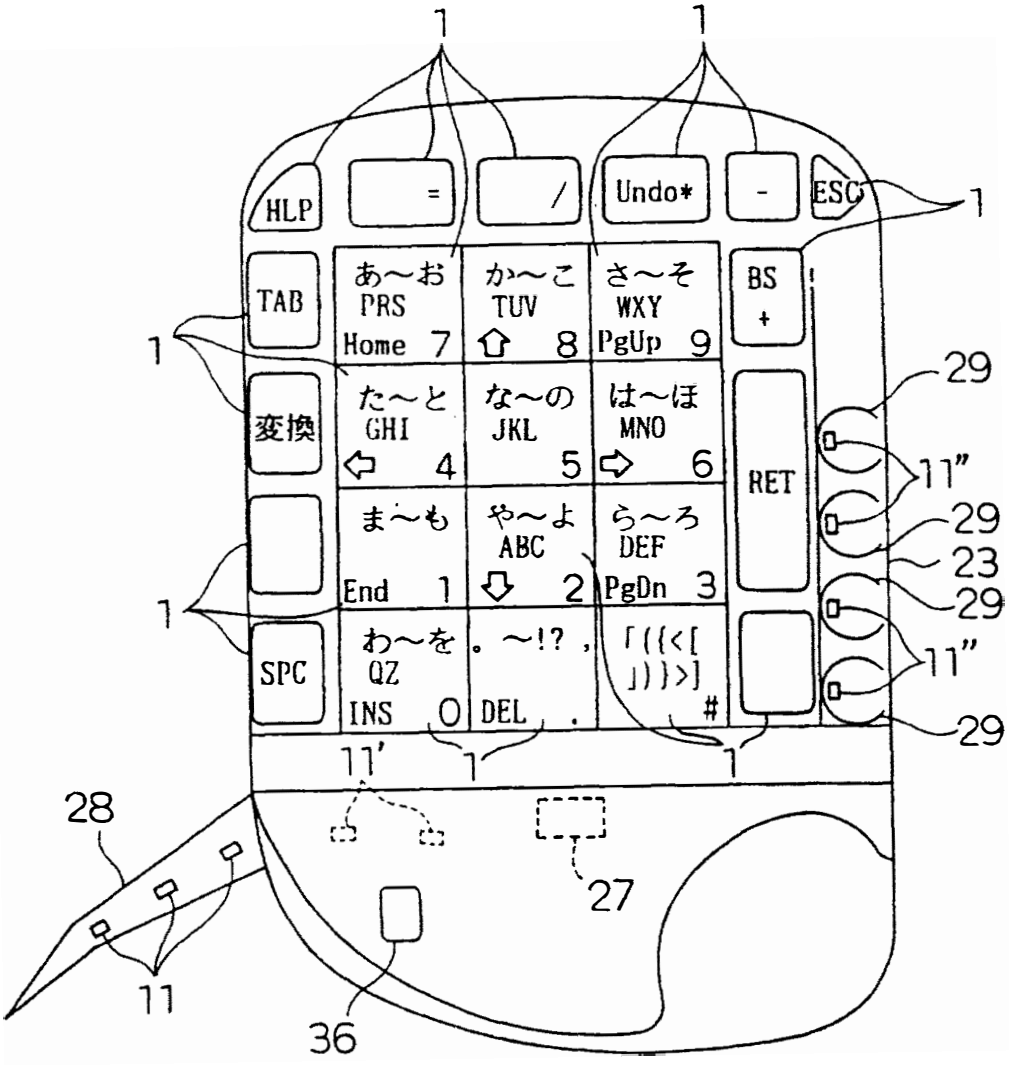


Fig. 27

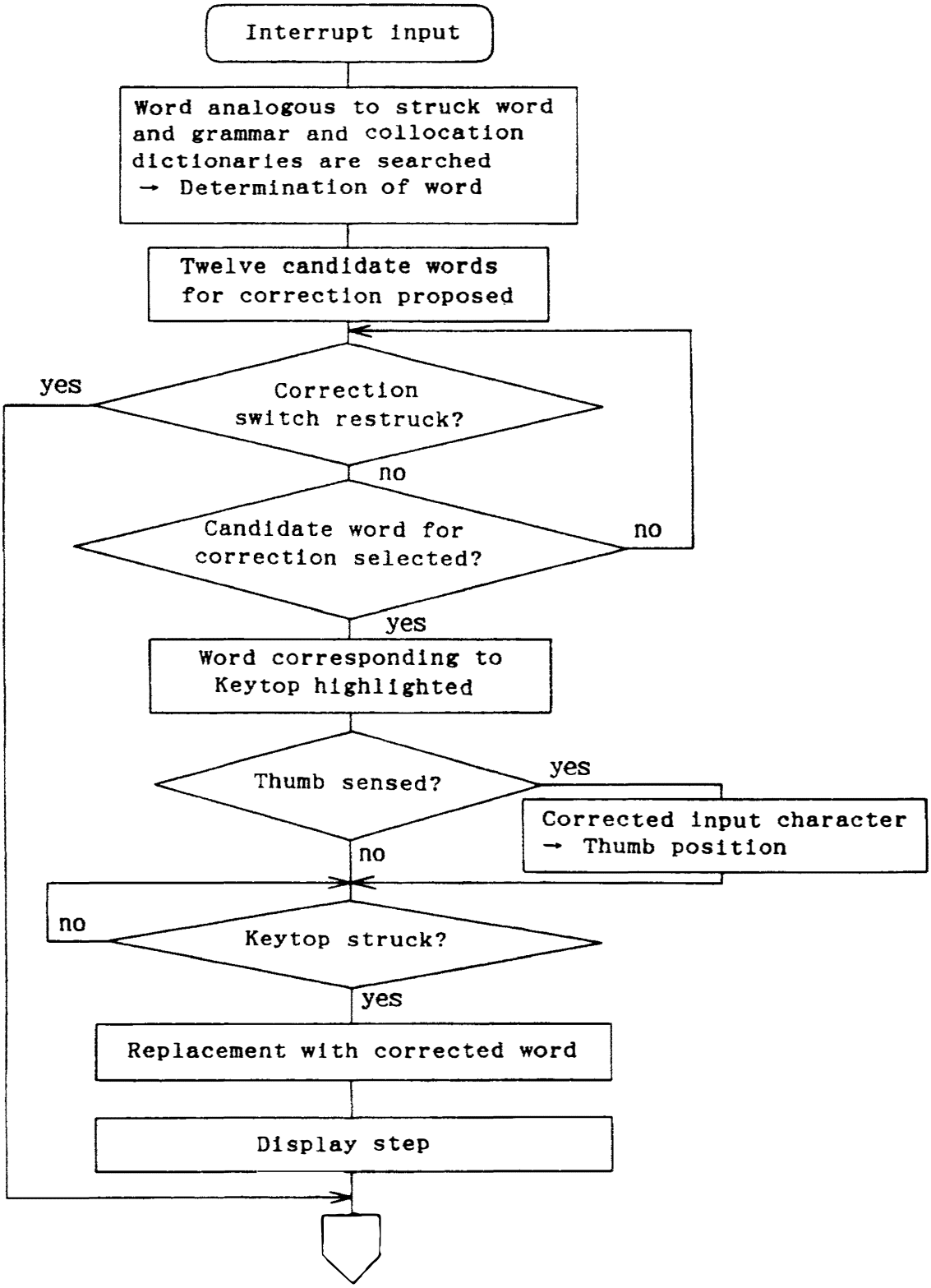
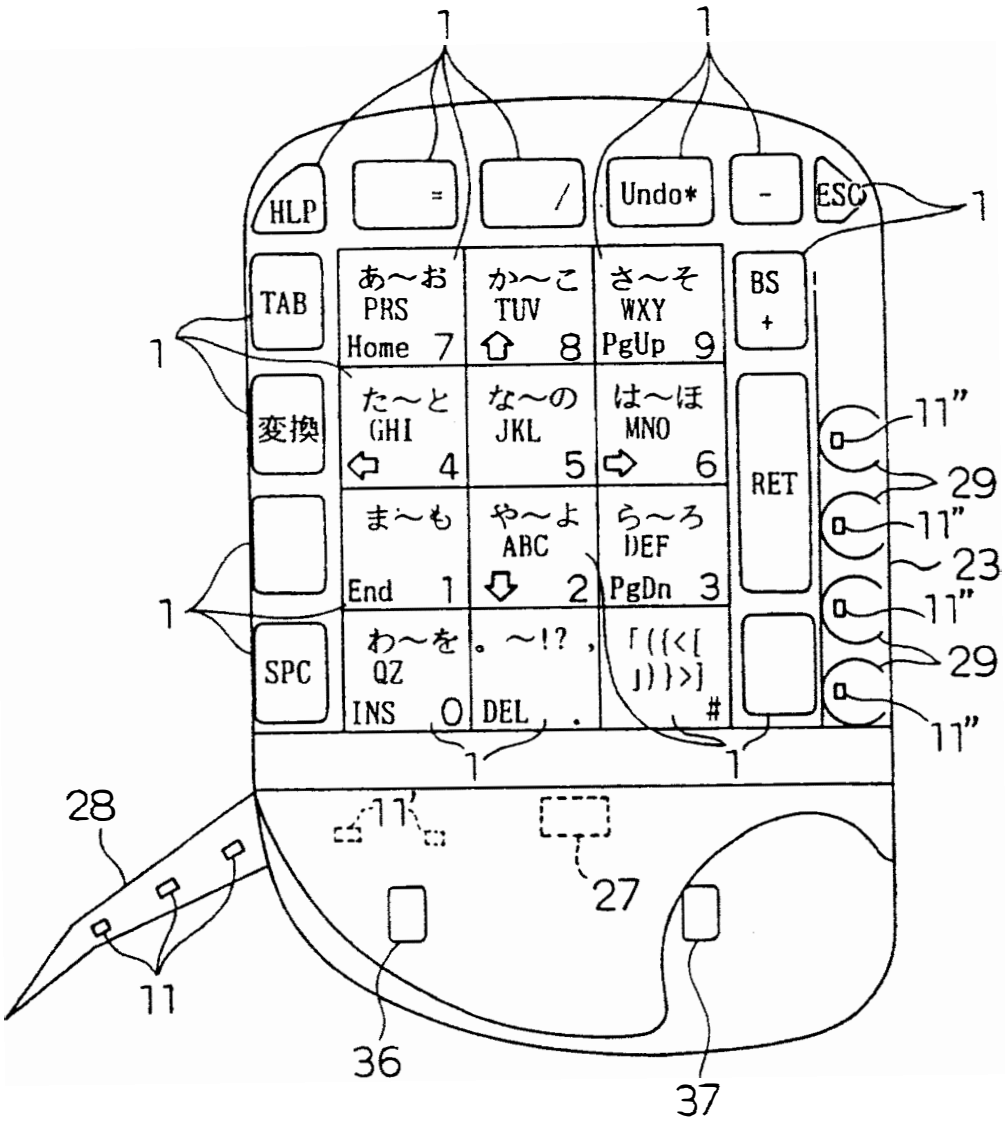


Fig. 28



36 switch

37 switch

Fig. 29

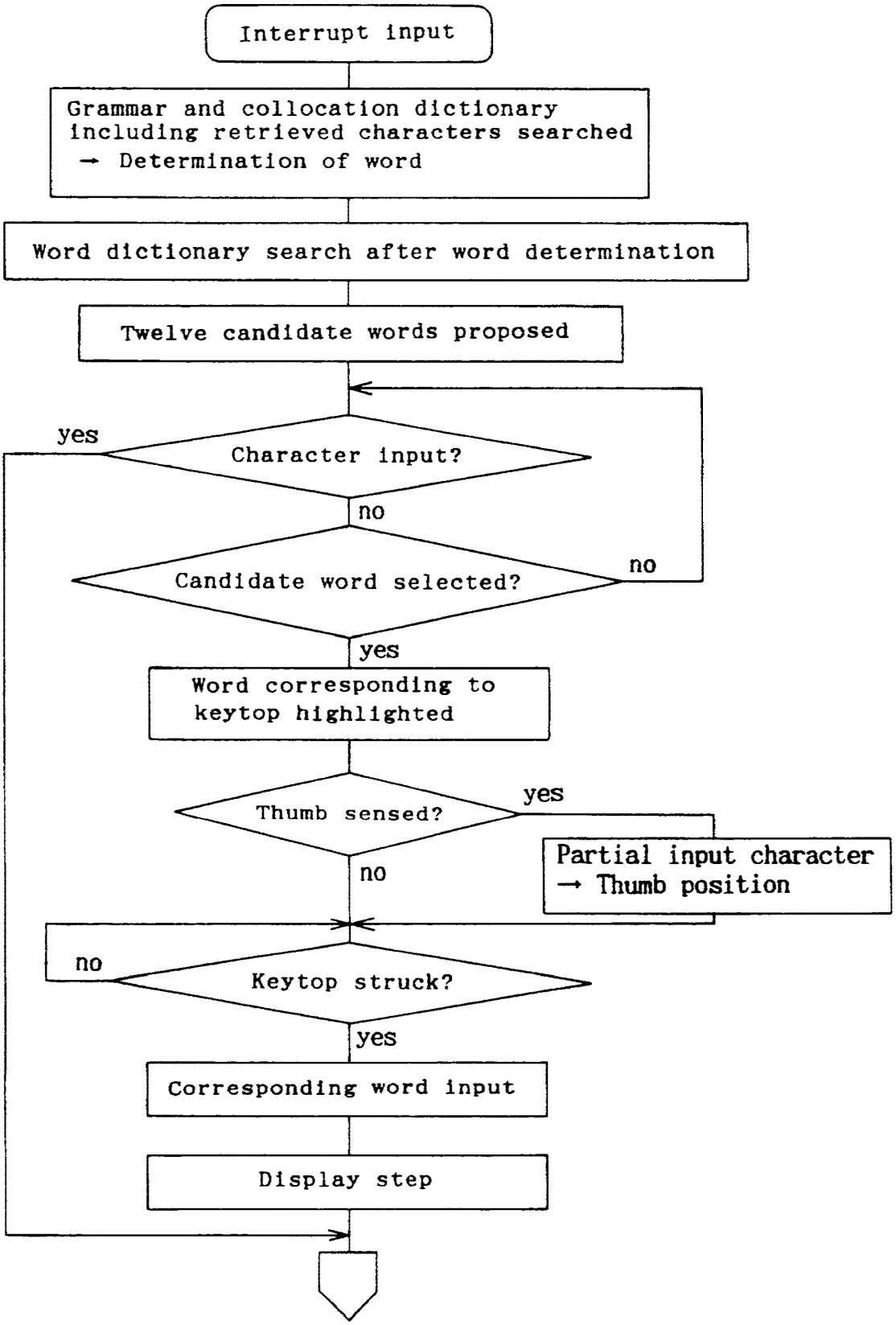


Fig. 30

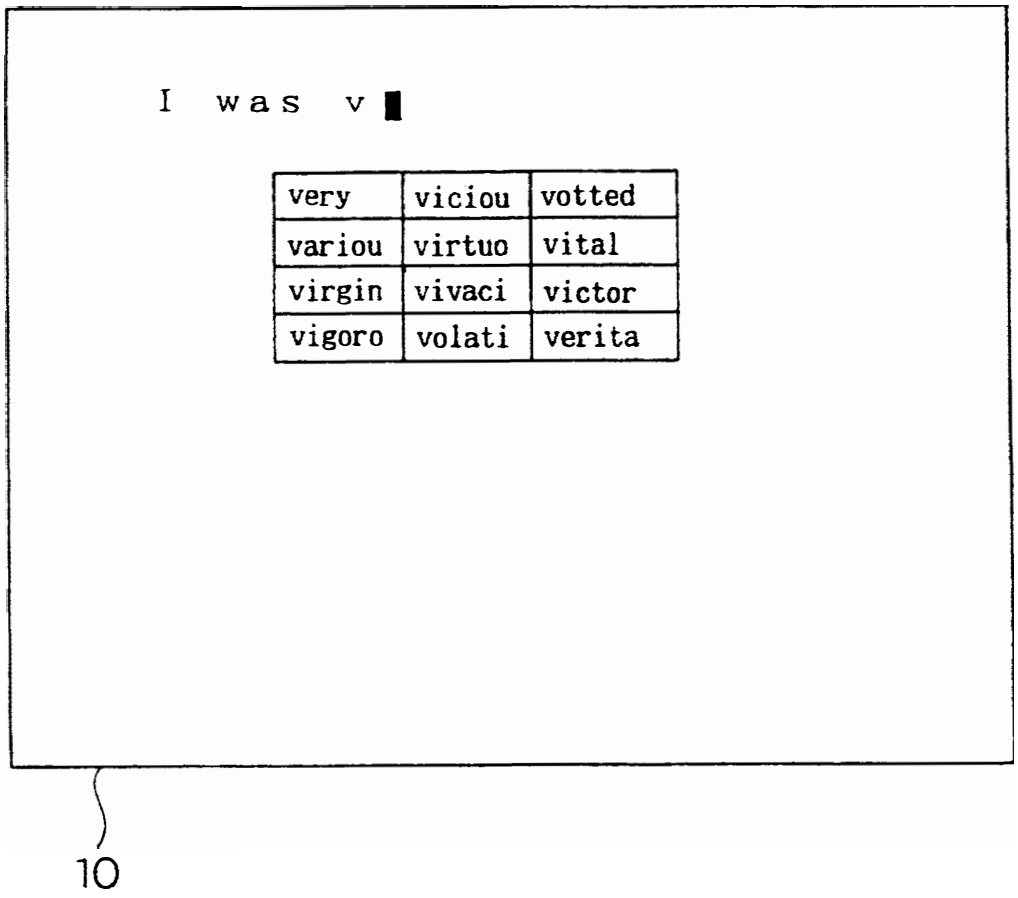


Fig. 31

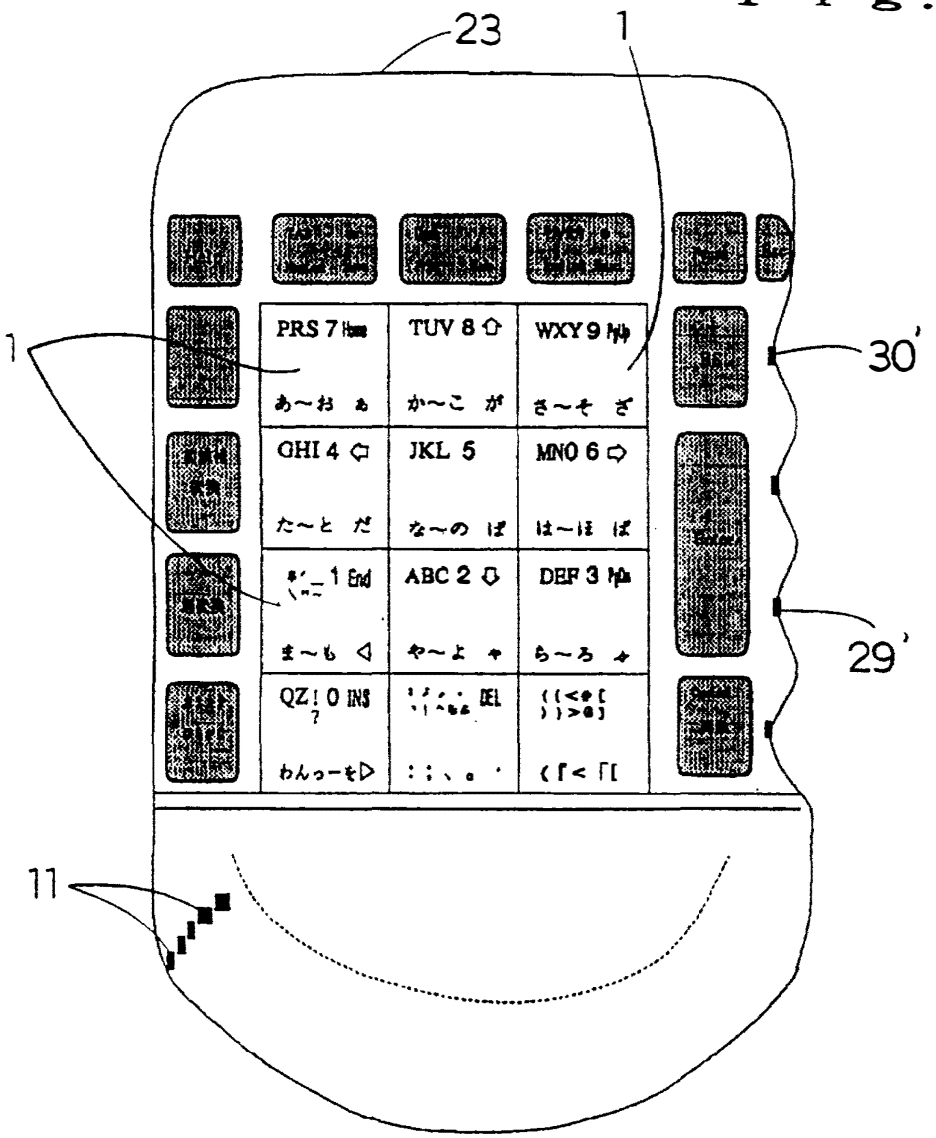
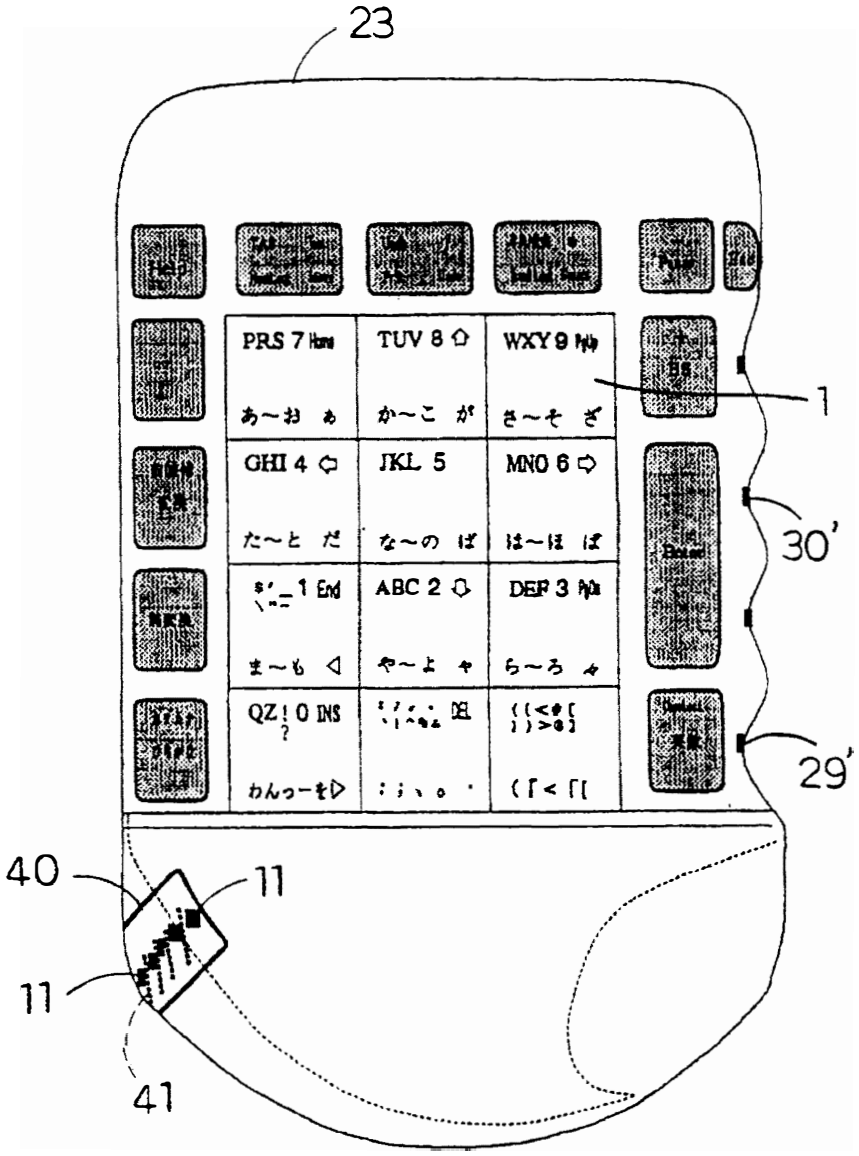


Fig. 32



40 switch

Fig. 33

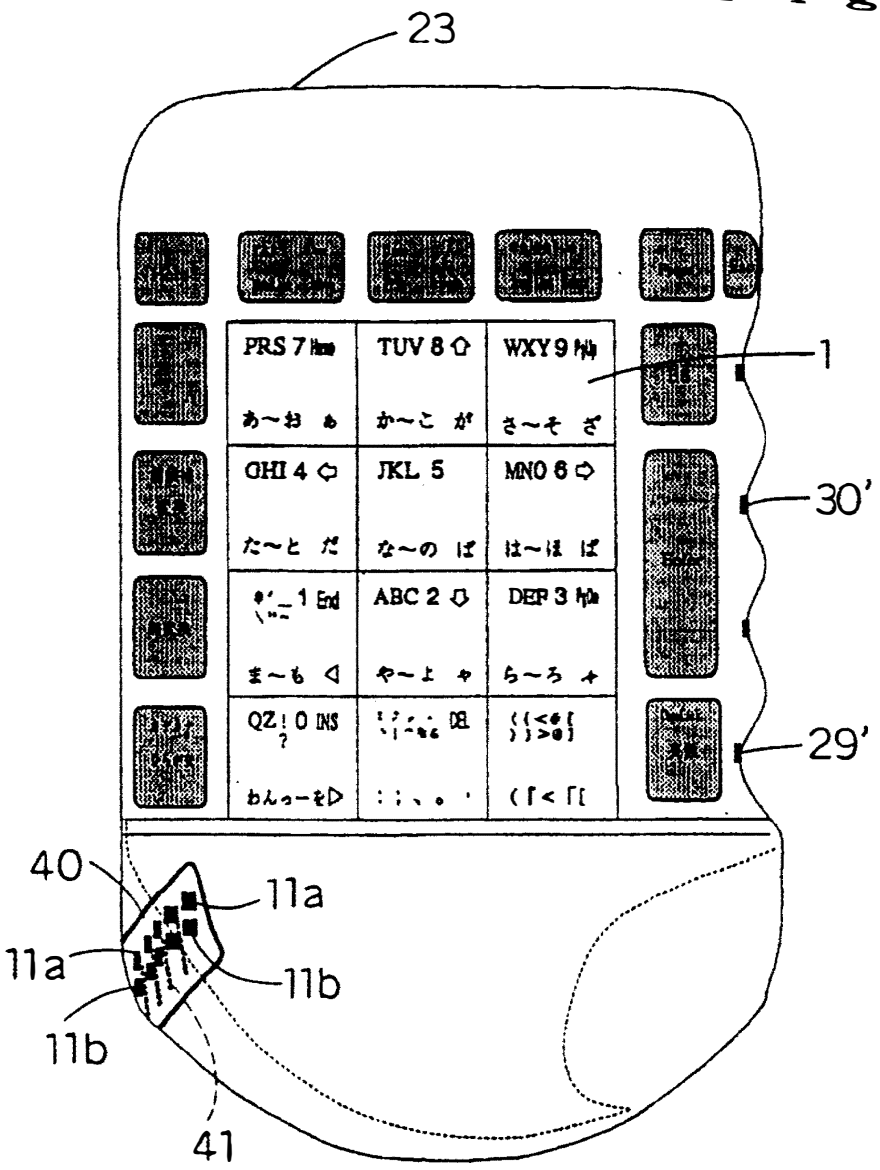


Fig. 34

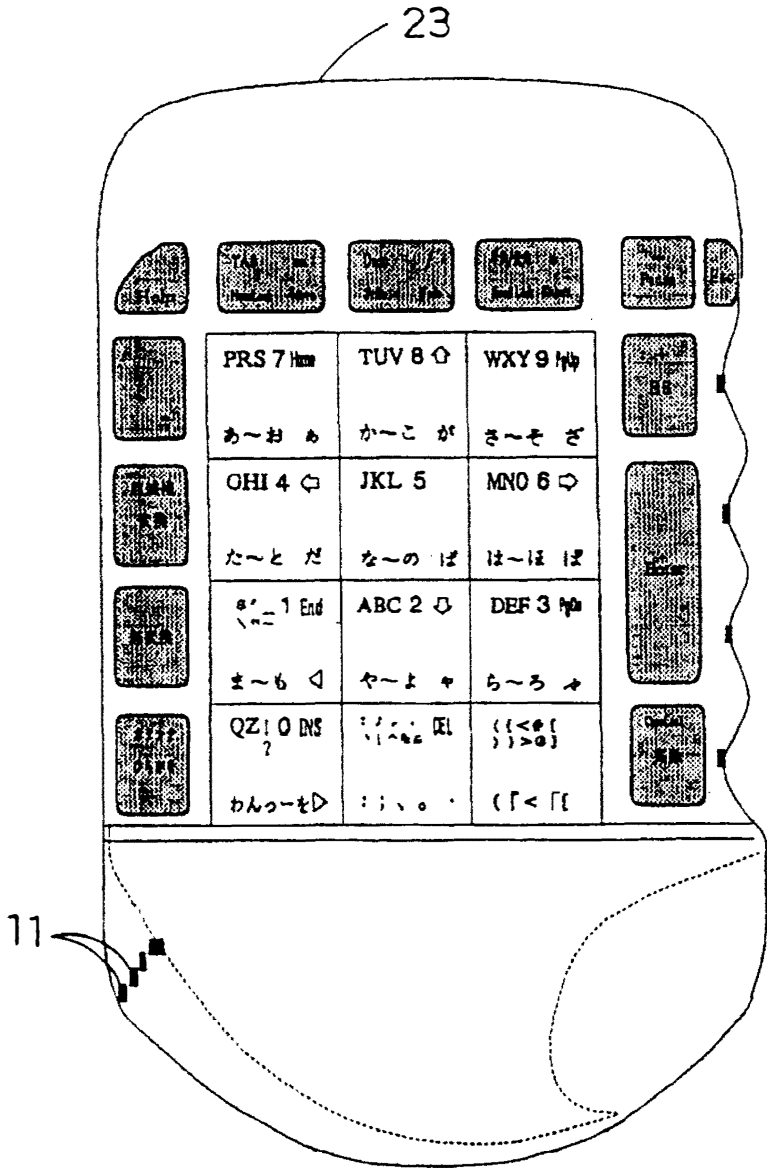
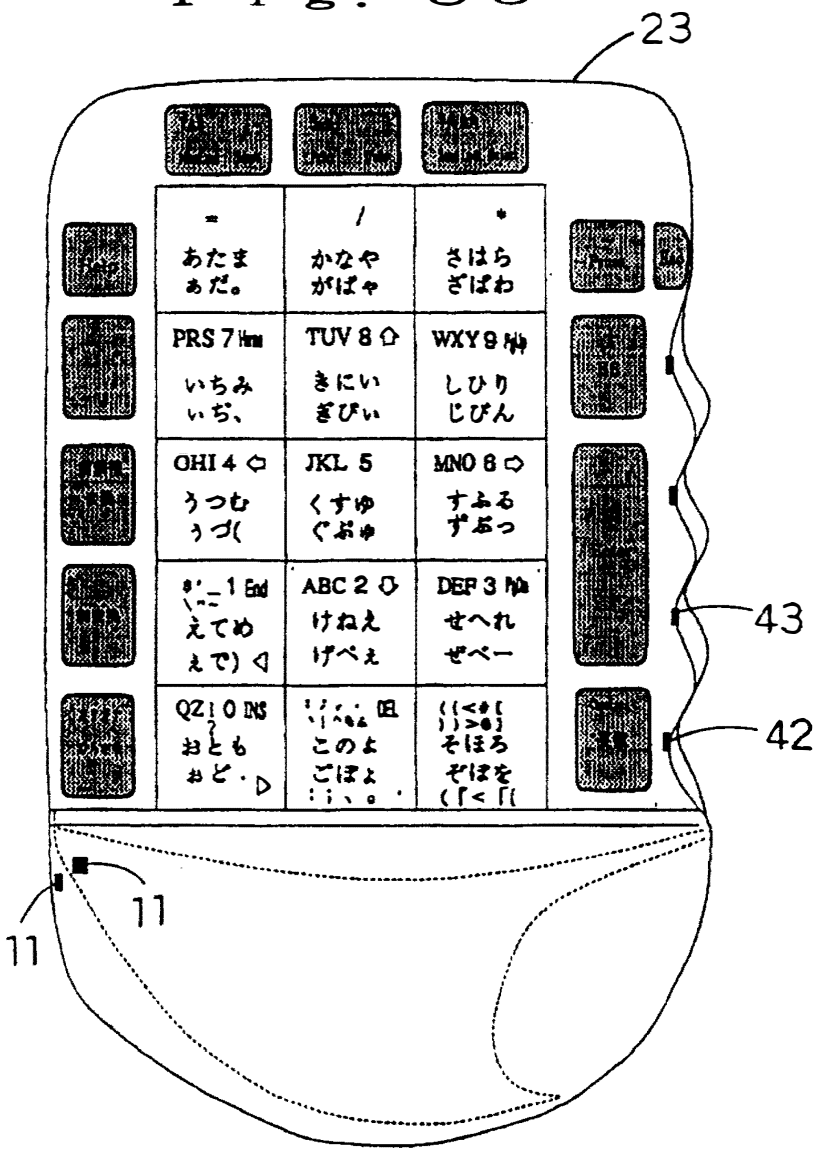


Fig. 35



42 little finger proximity sensor

Fig. 36

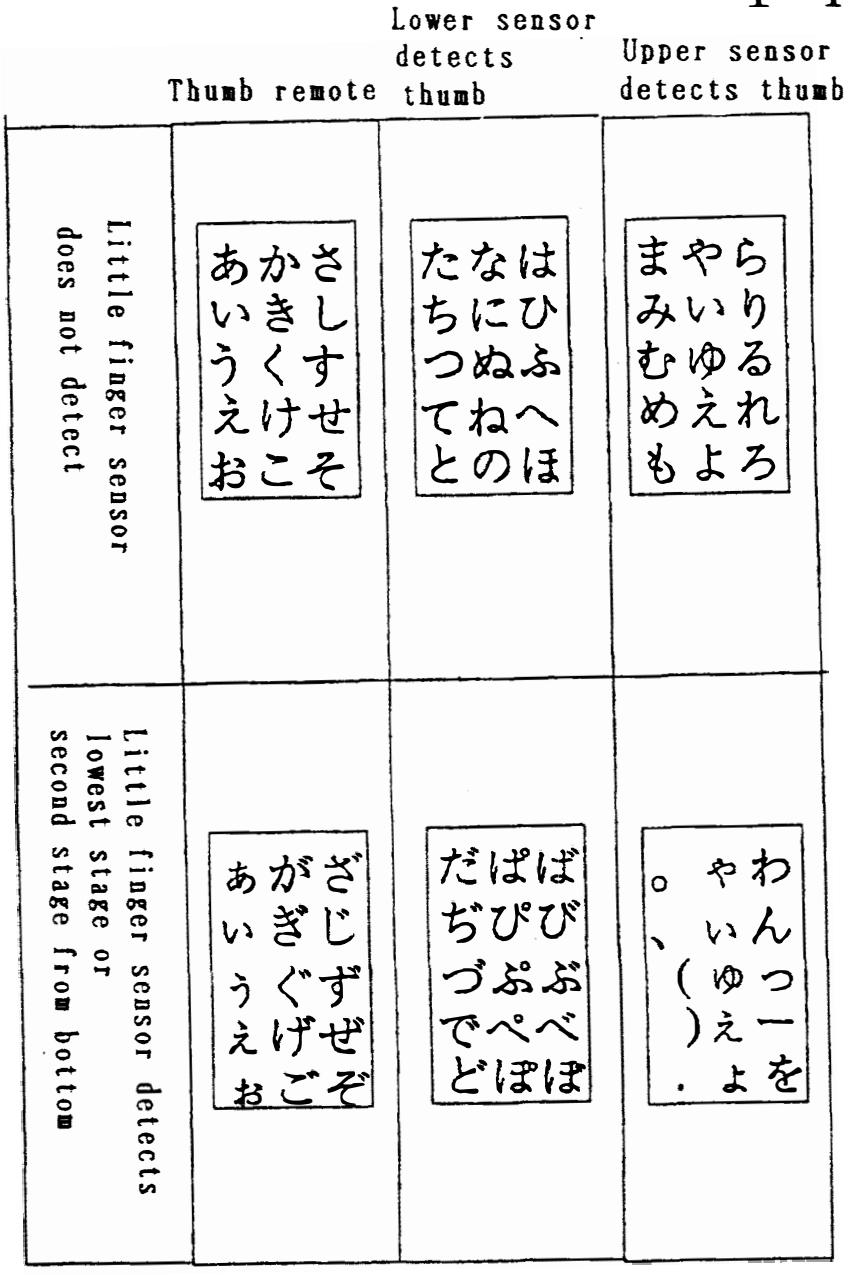


Fig. 37

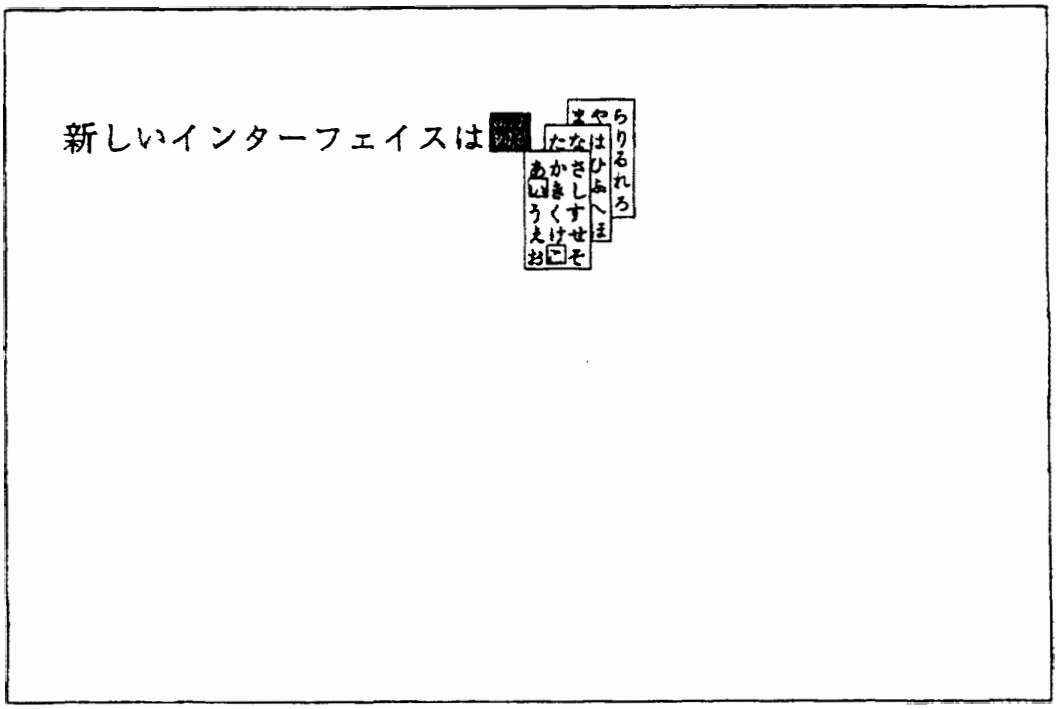


Fig. 38

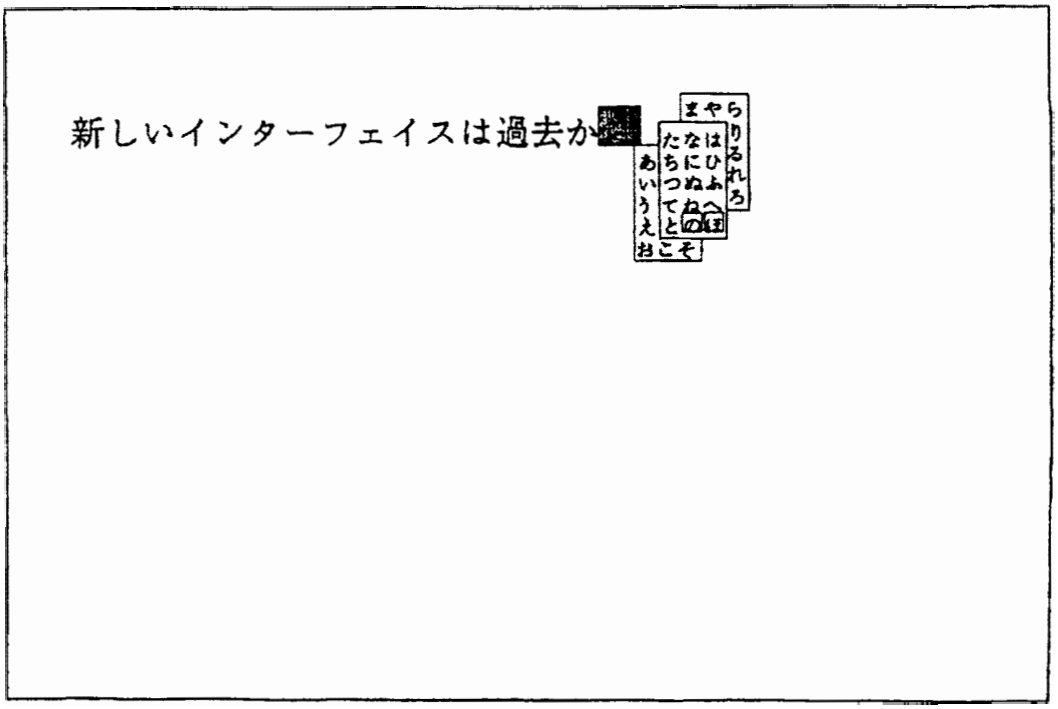


Fig. 39

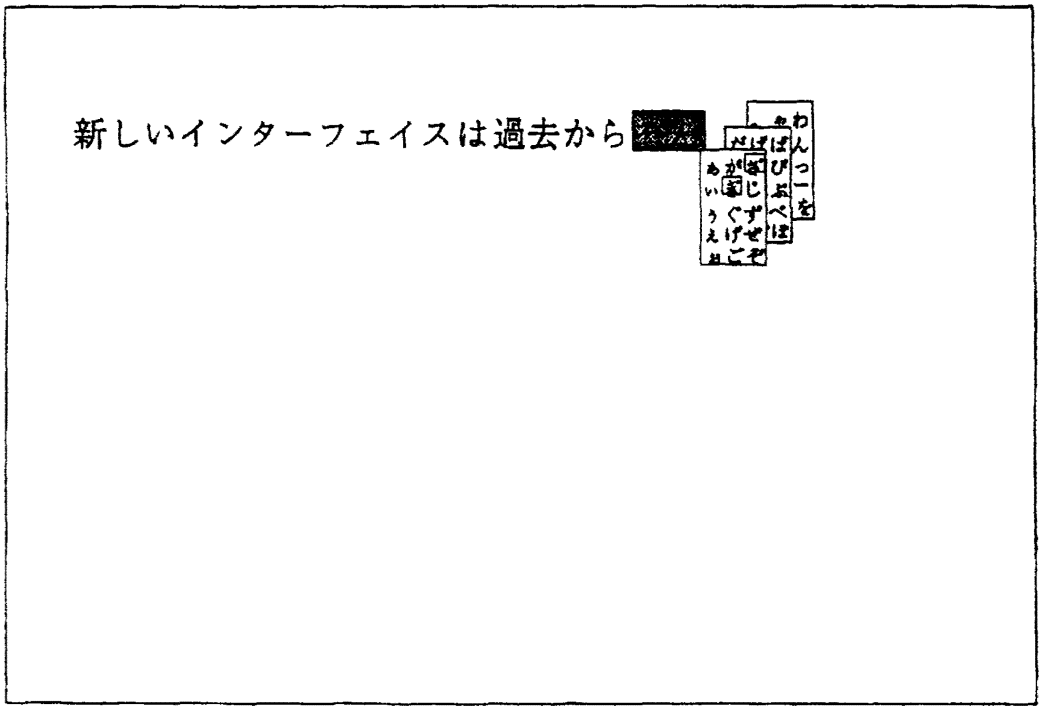
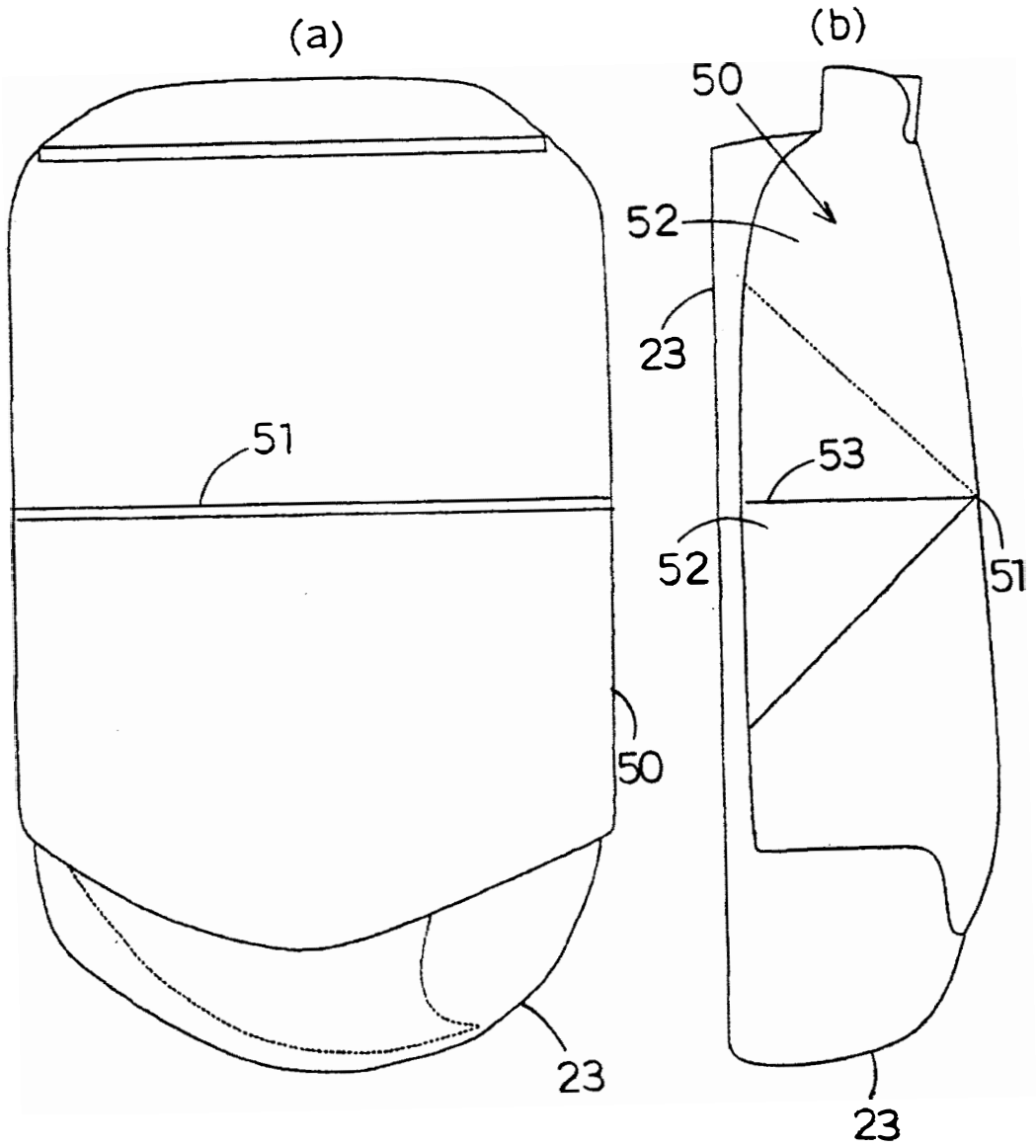


Fig. 40



50 cover

Fig. 41

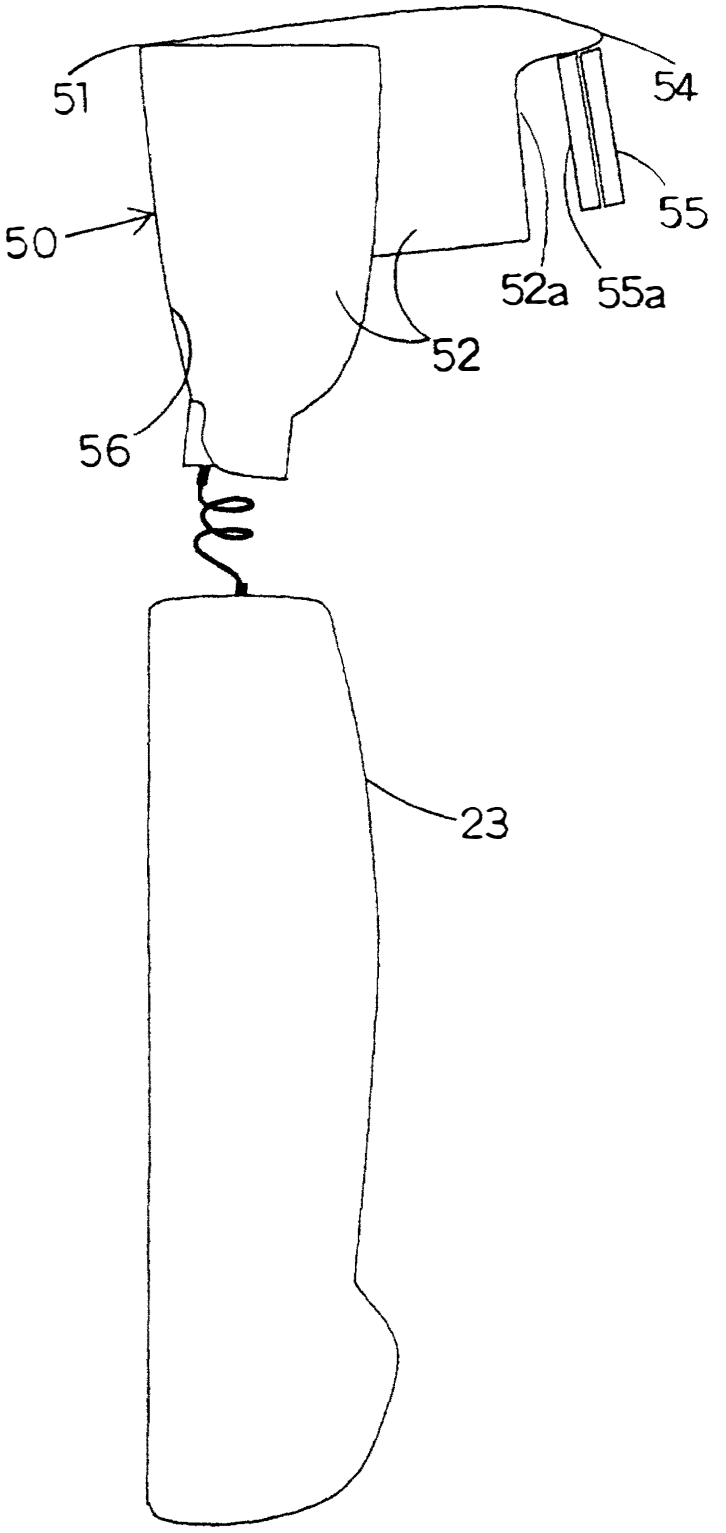
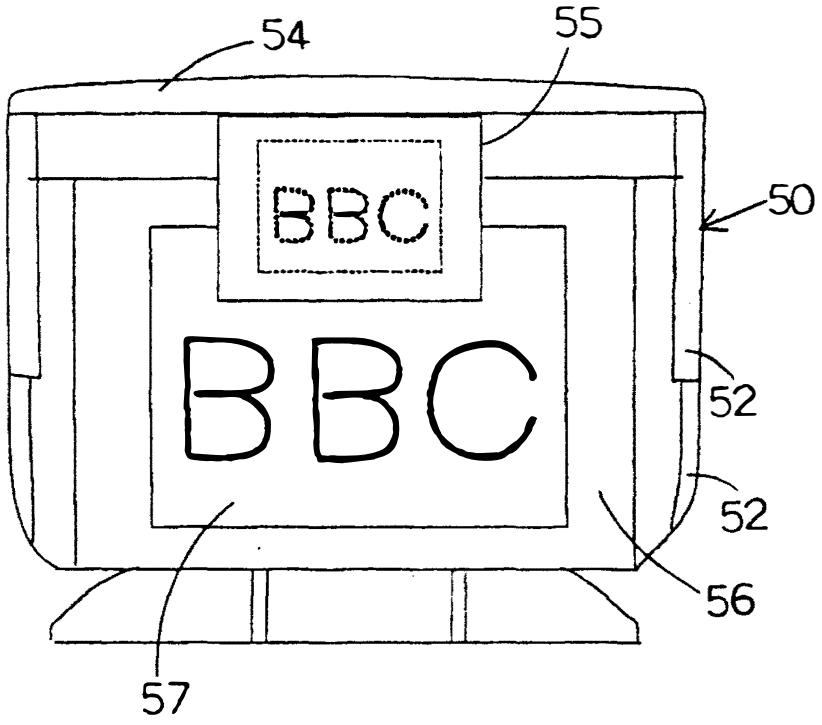


Fig. 42



55 display unit

57 concave magnification mirror

Fig. 43

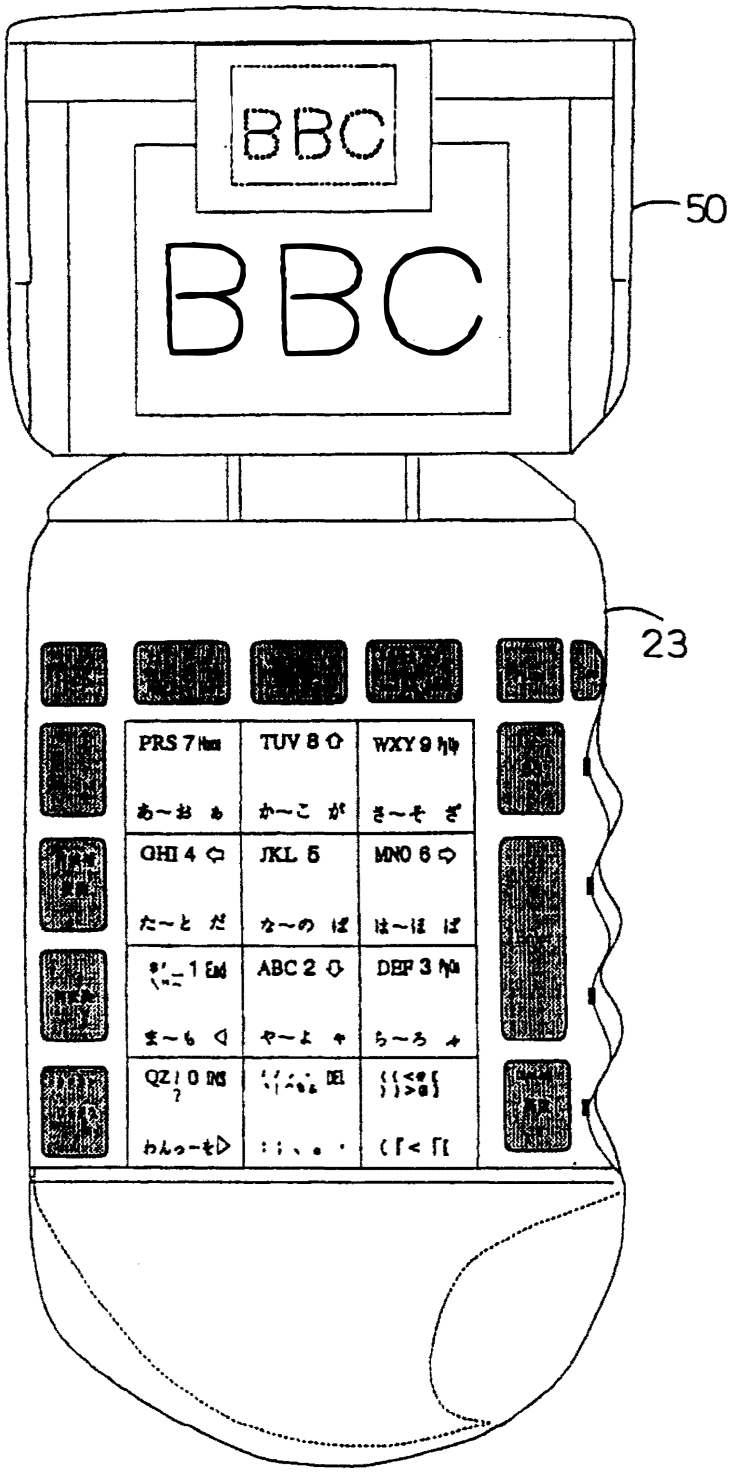


Fig. 44

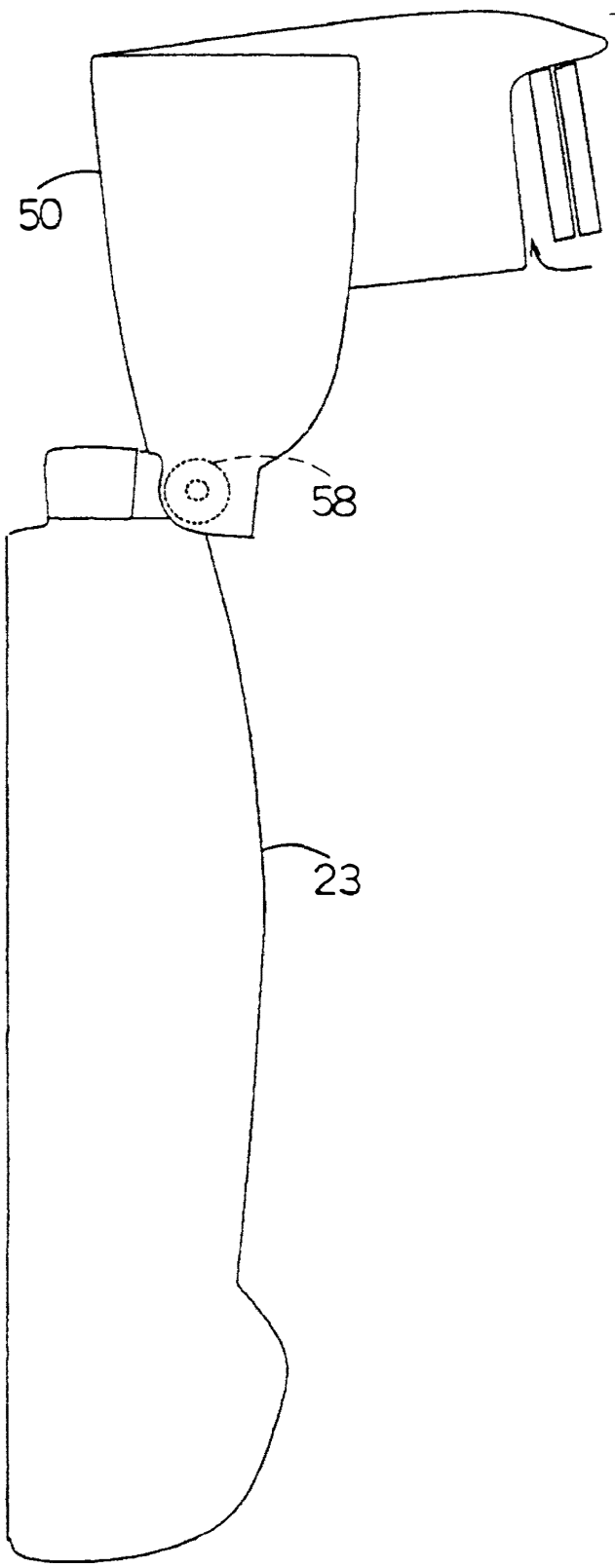


Fig. 45

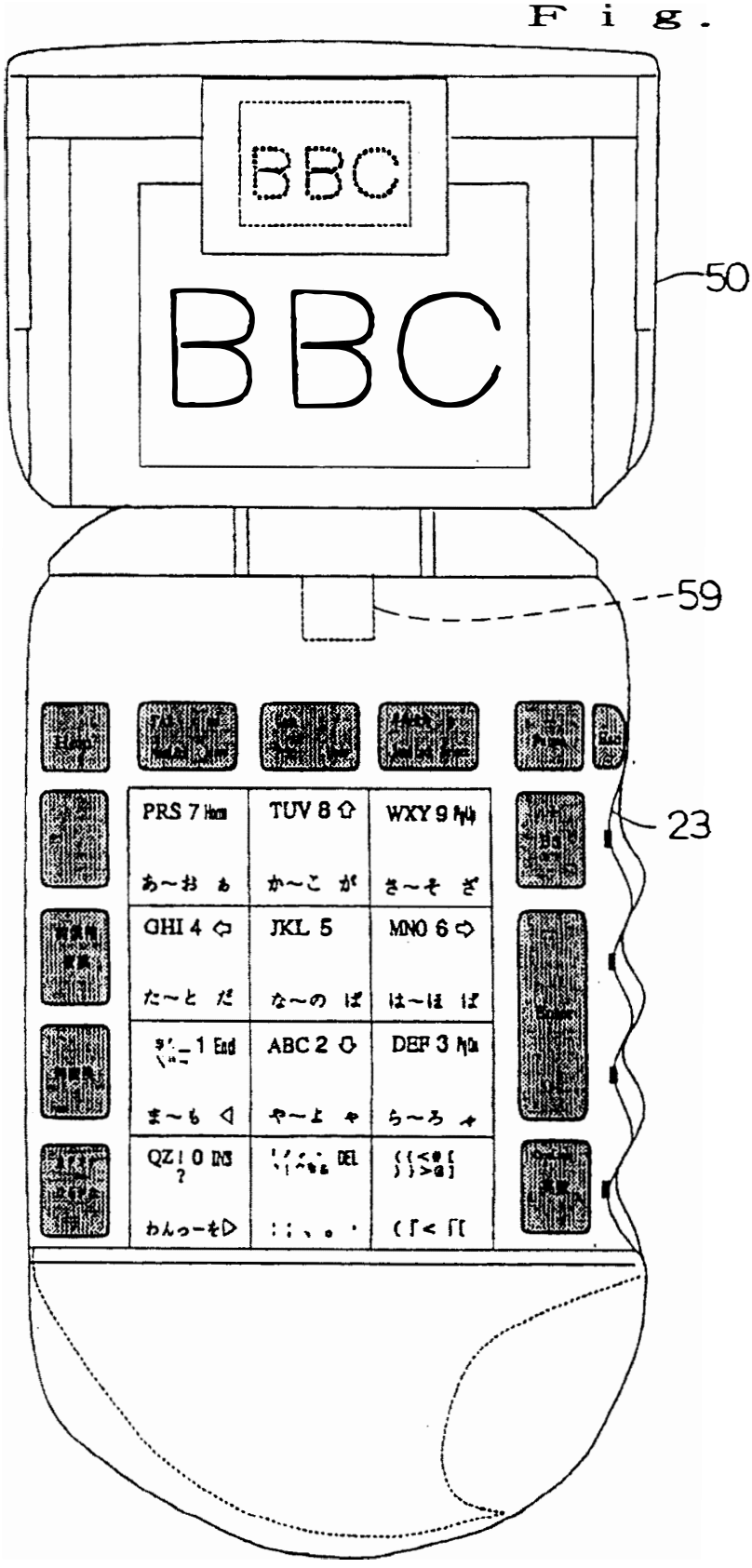


Fig. 46

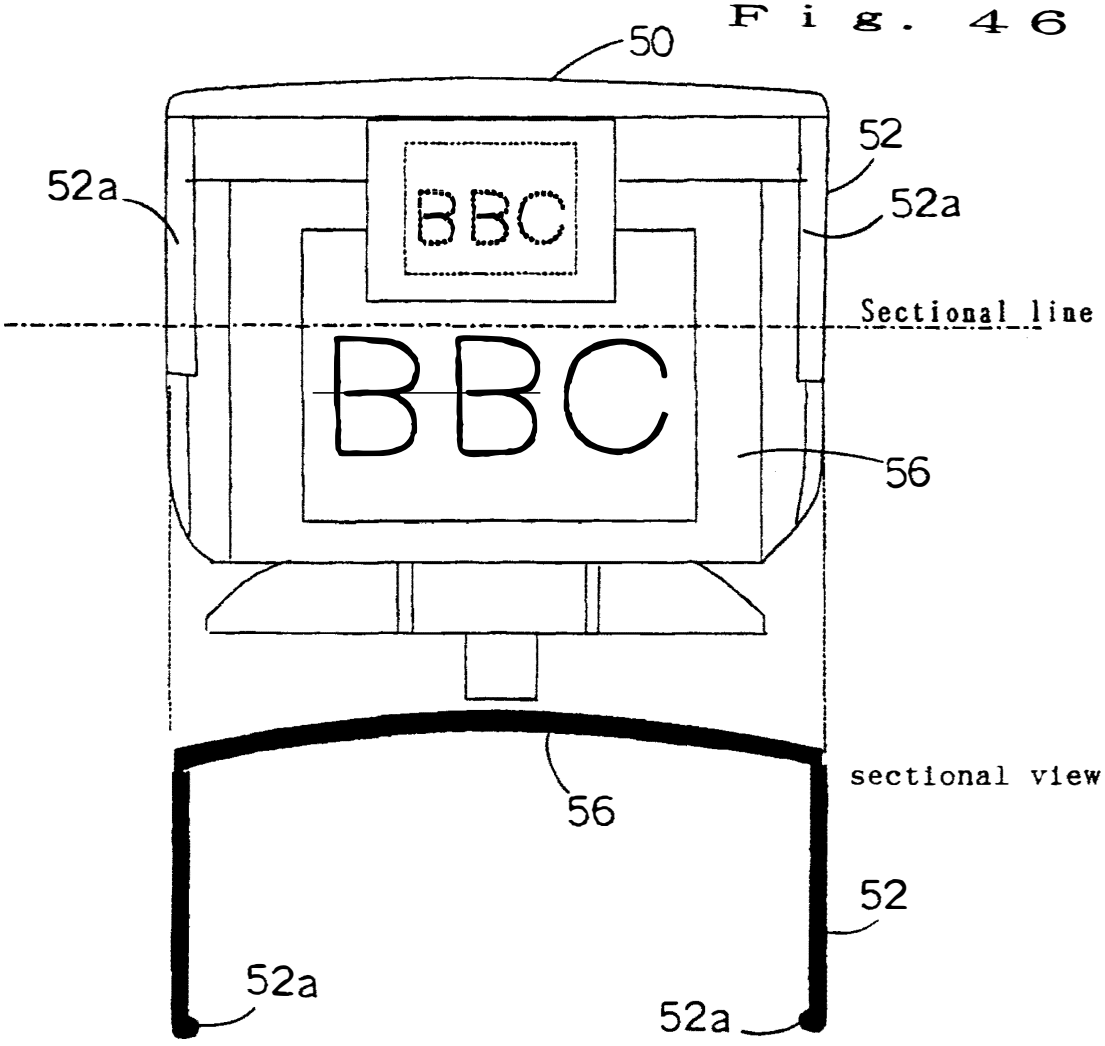
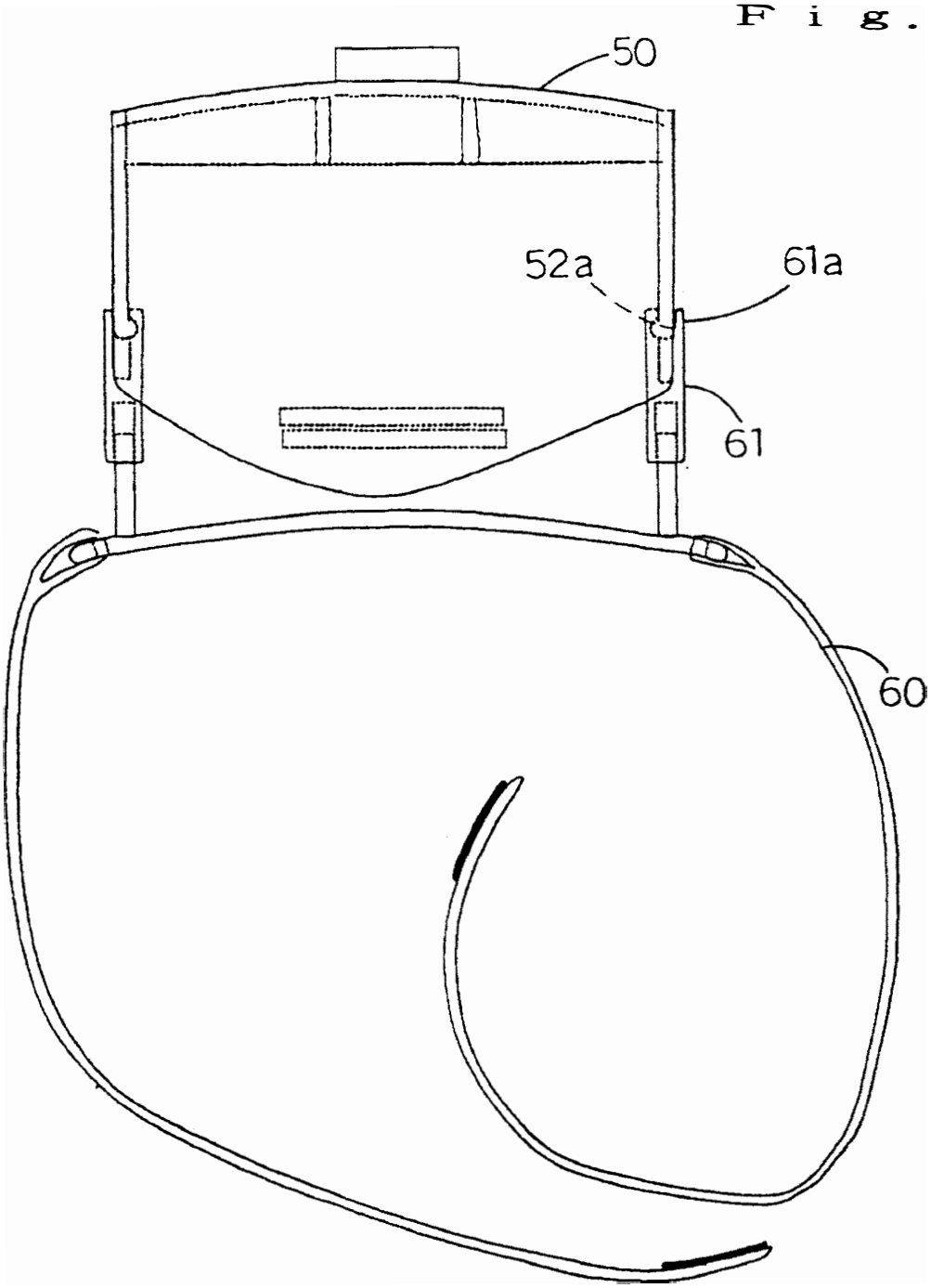


Fig. 47



60 head band

Fig. 48

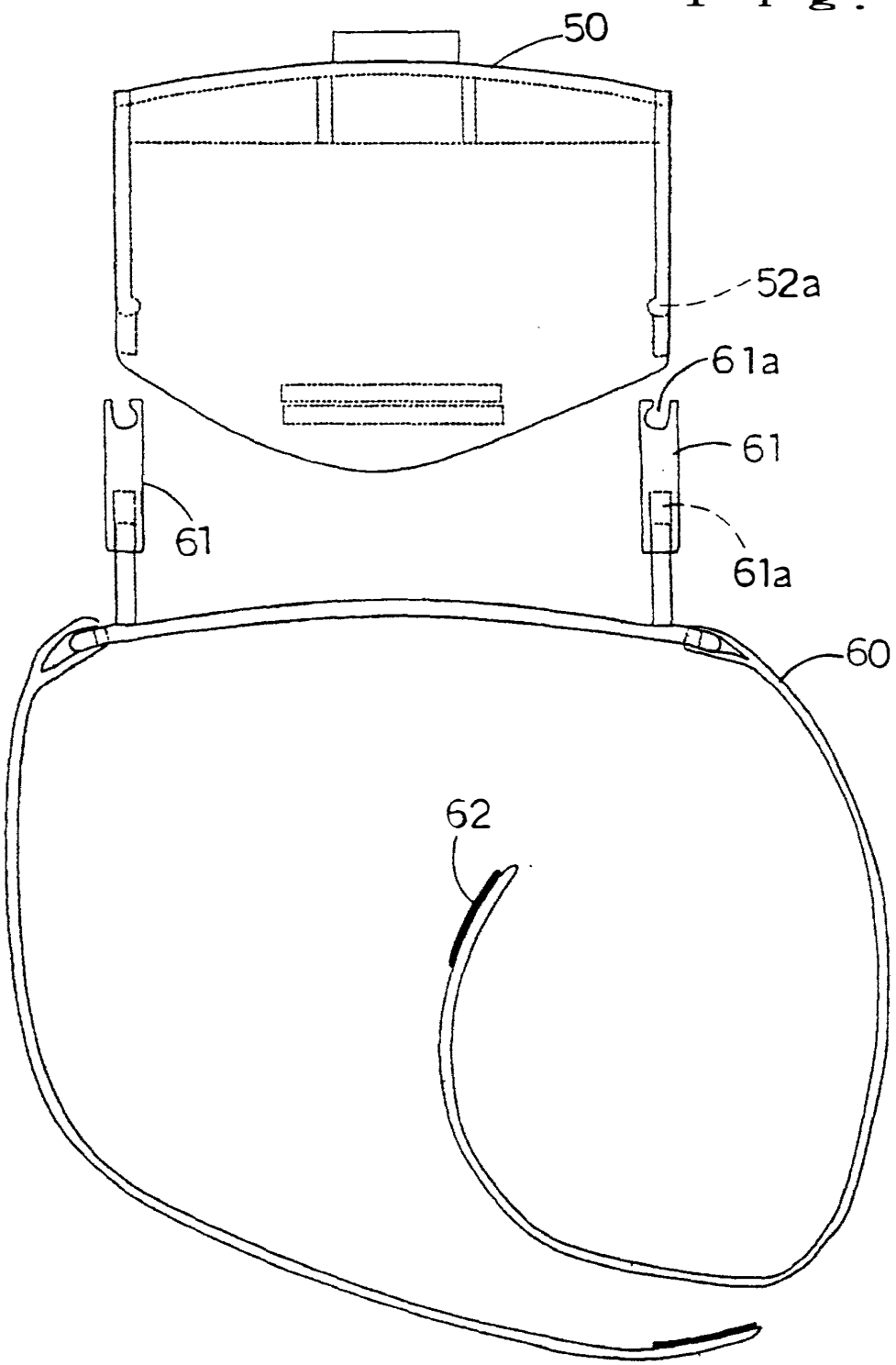


Fig. 49

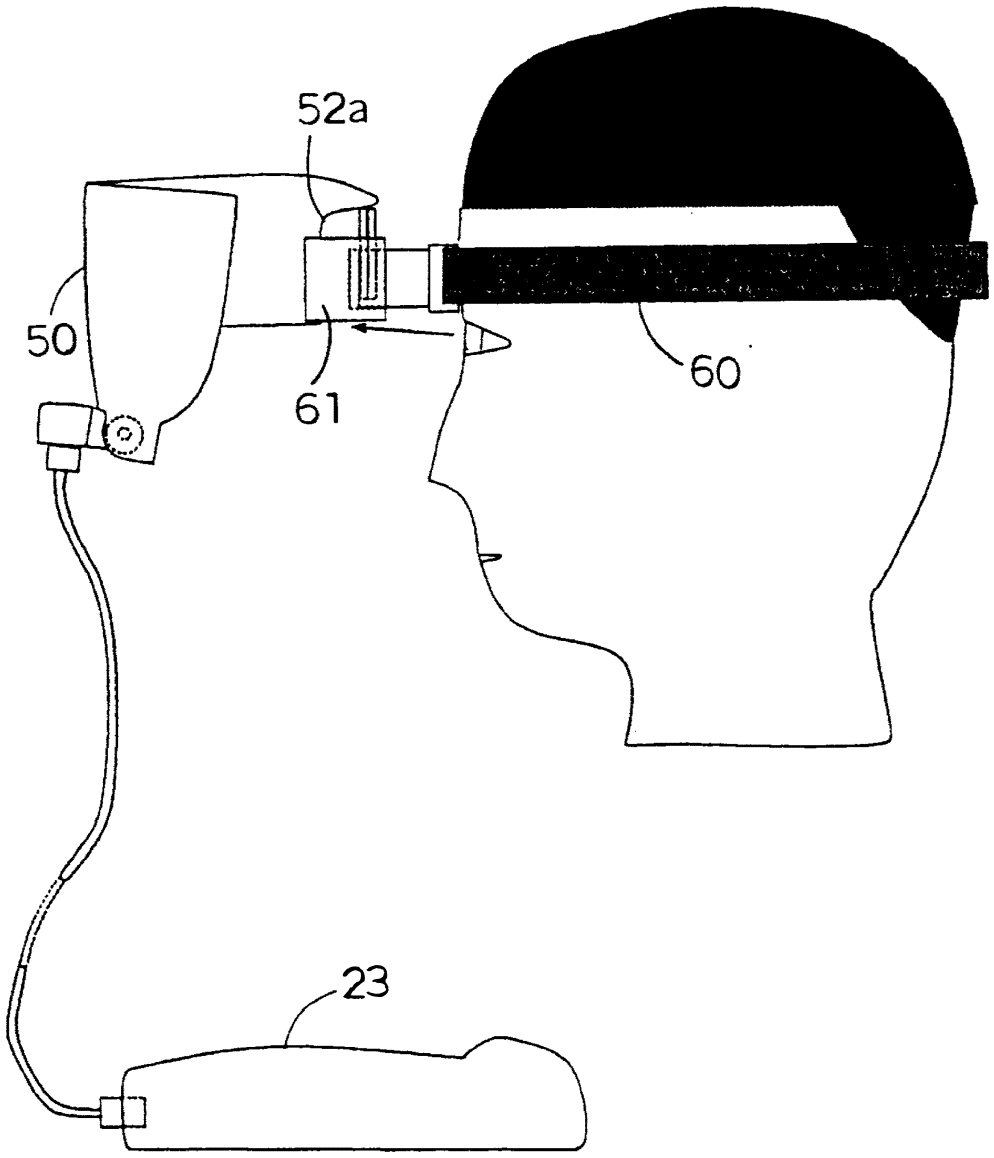


Fig. 50

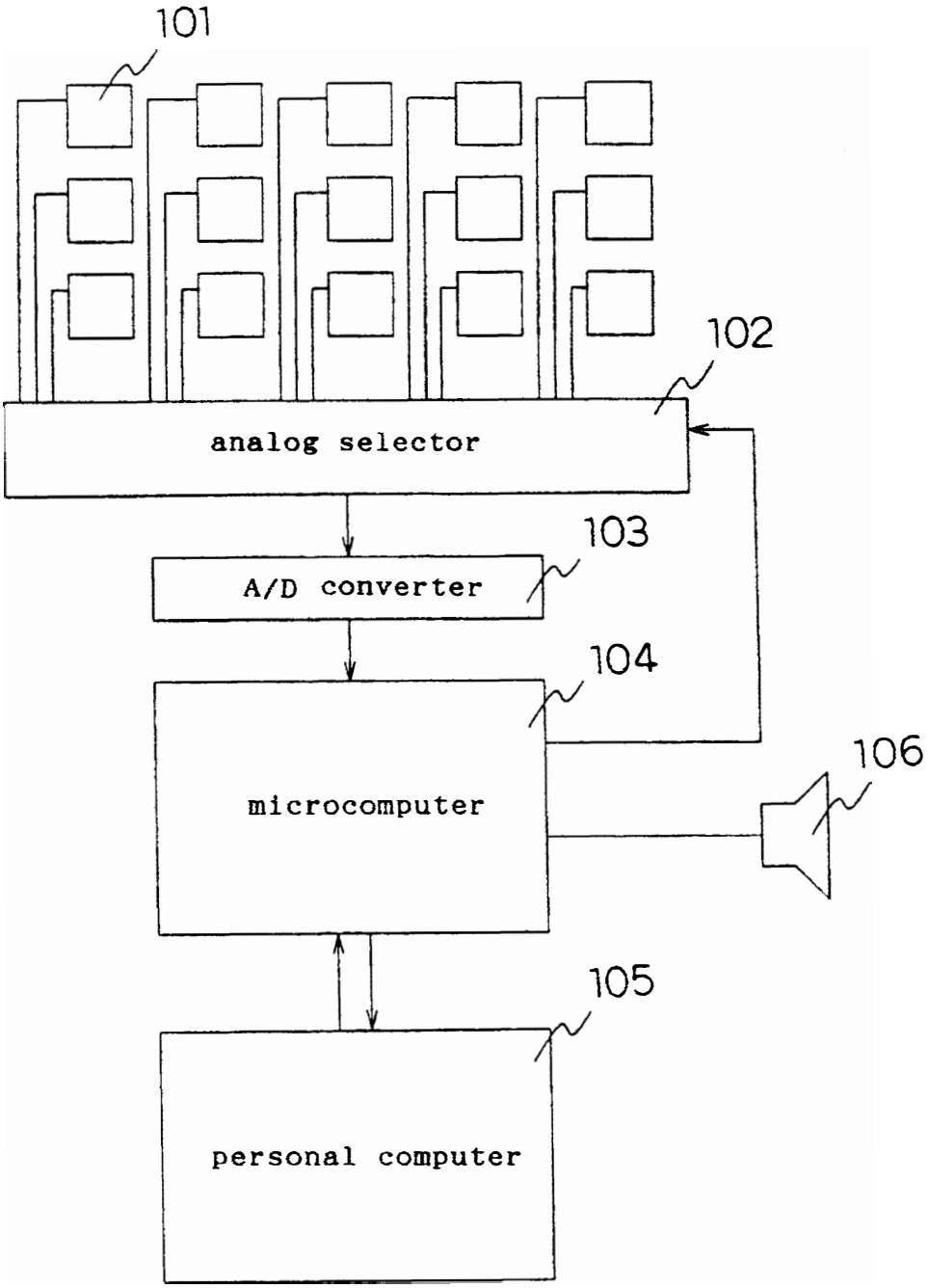


Fig. 51

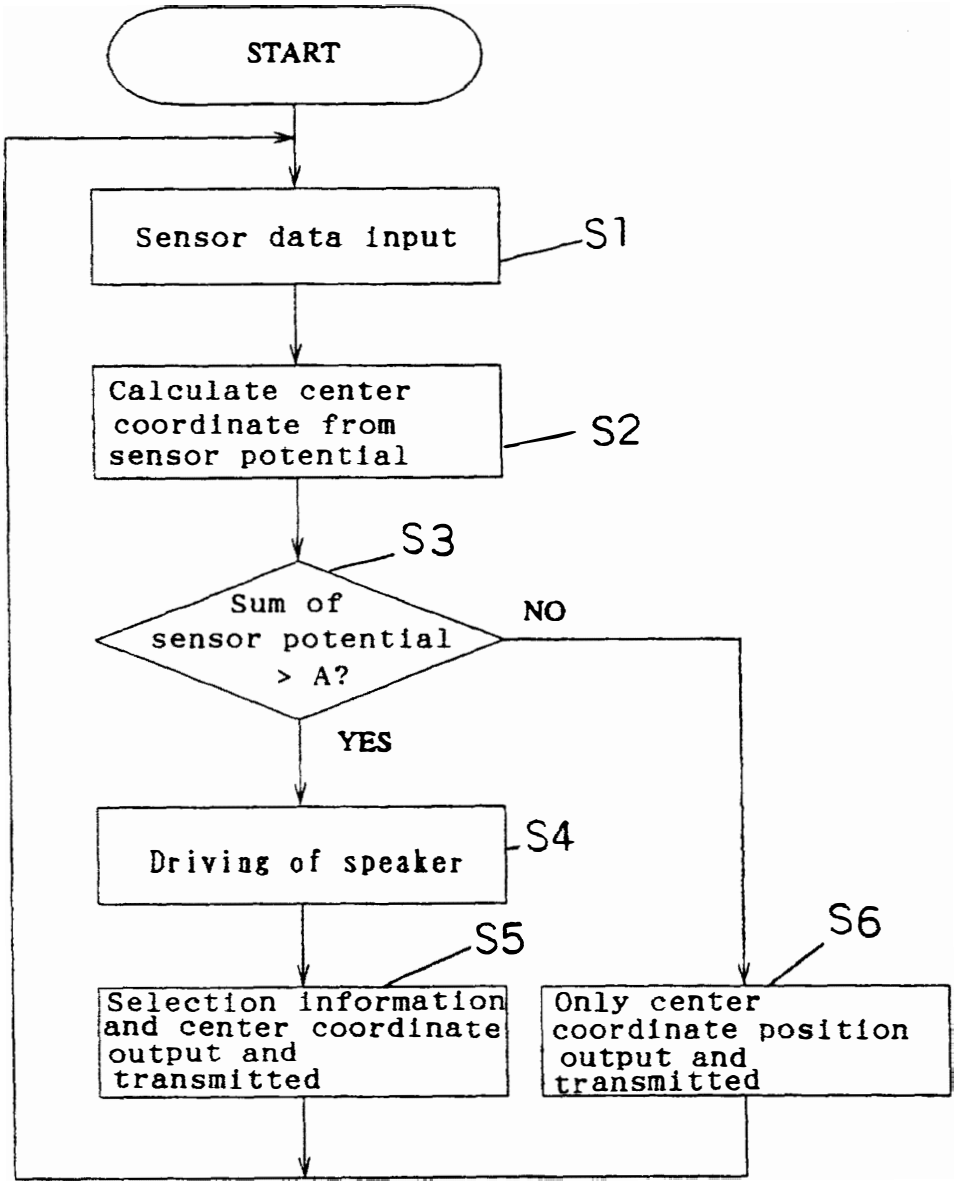


Fig. 52

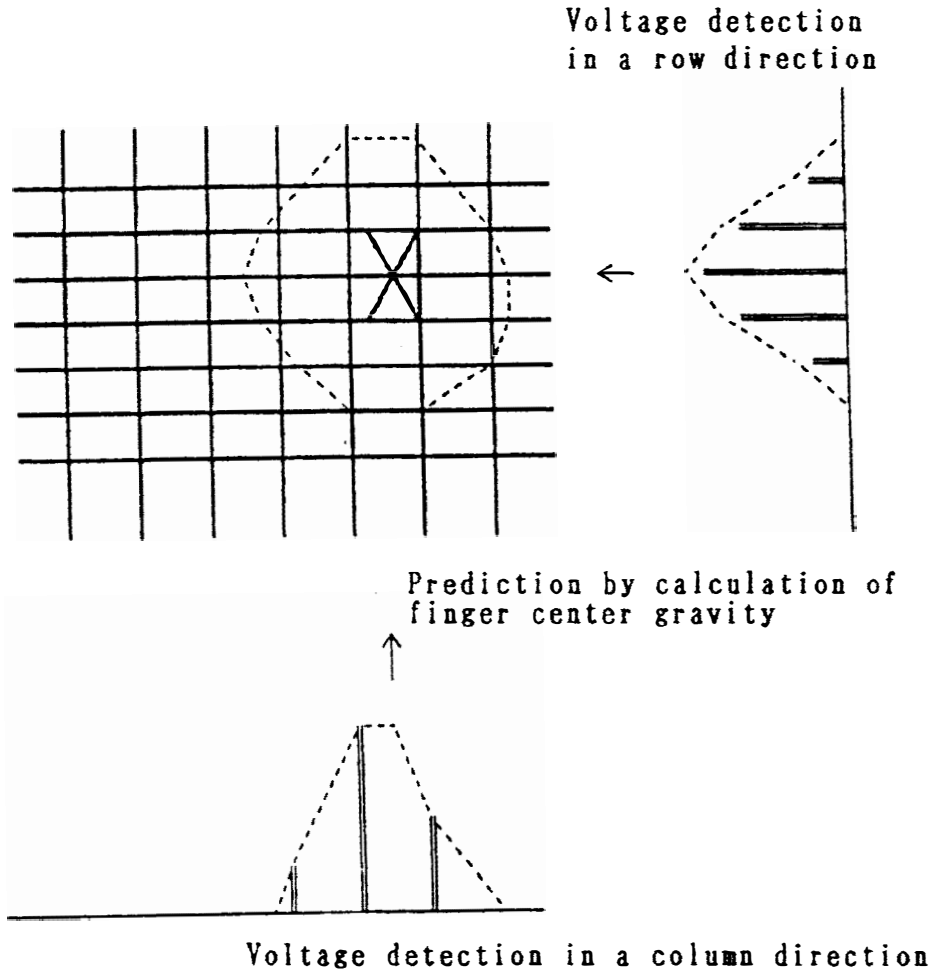


Fig. 53

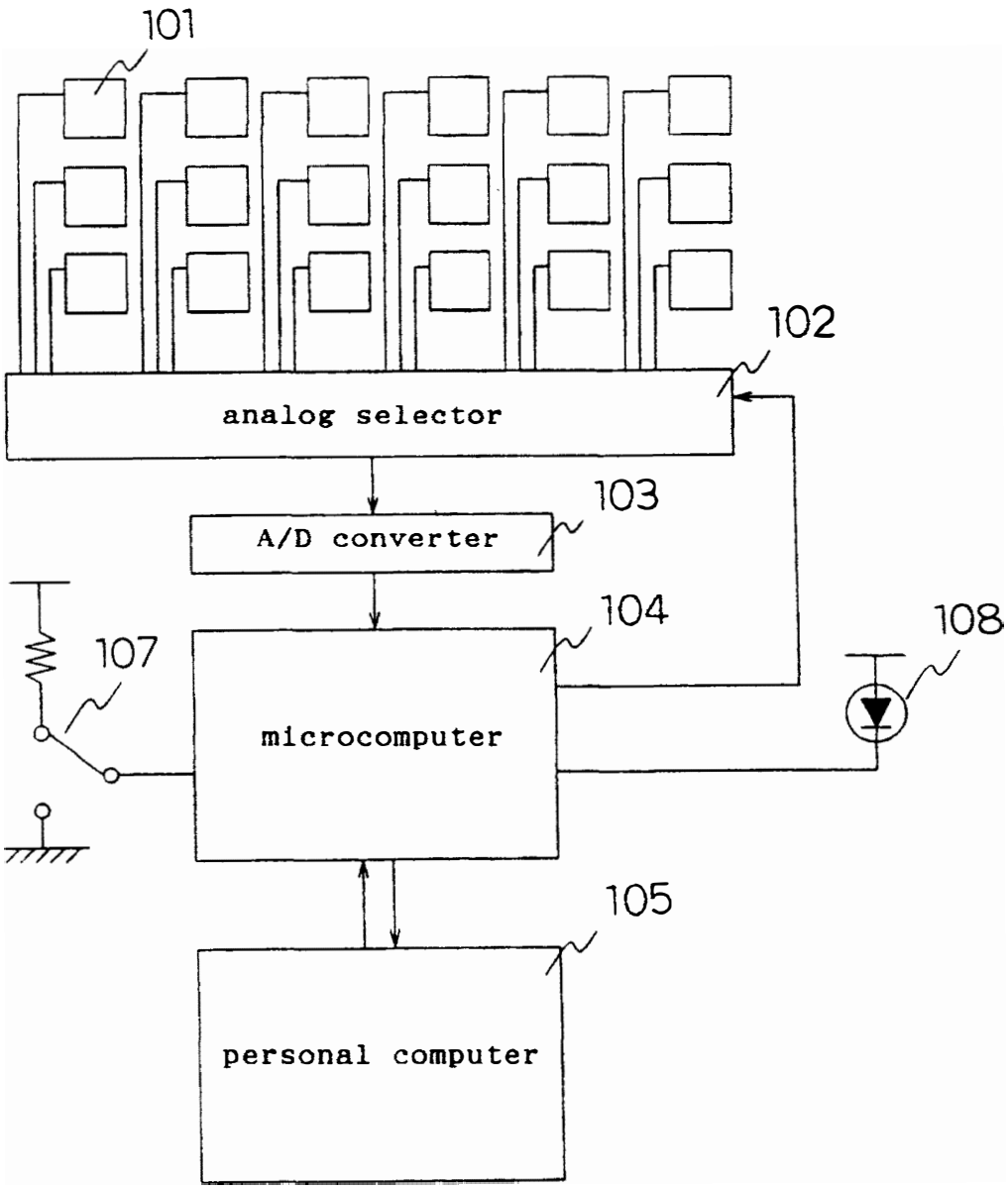


Fig. 54

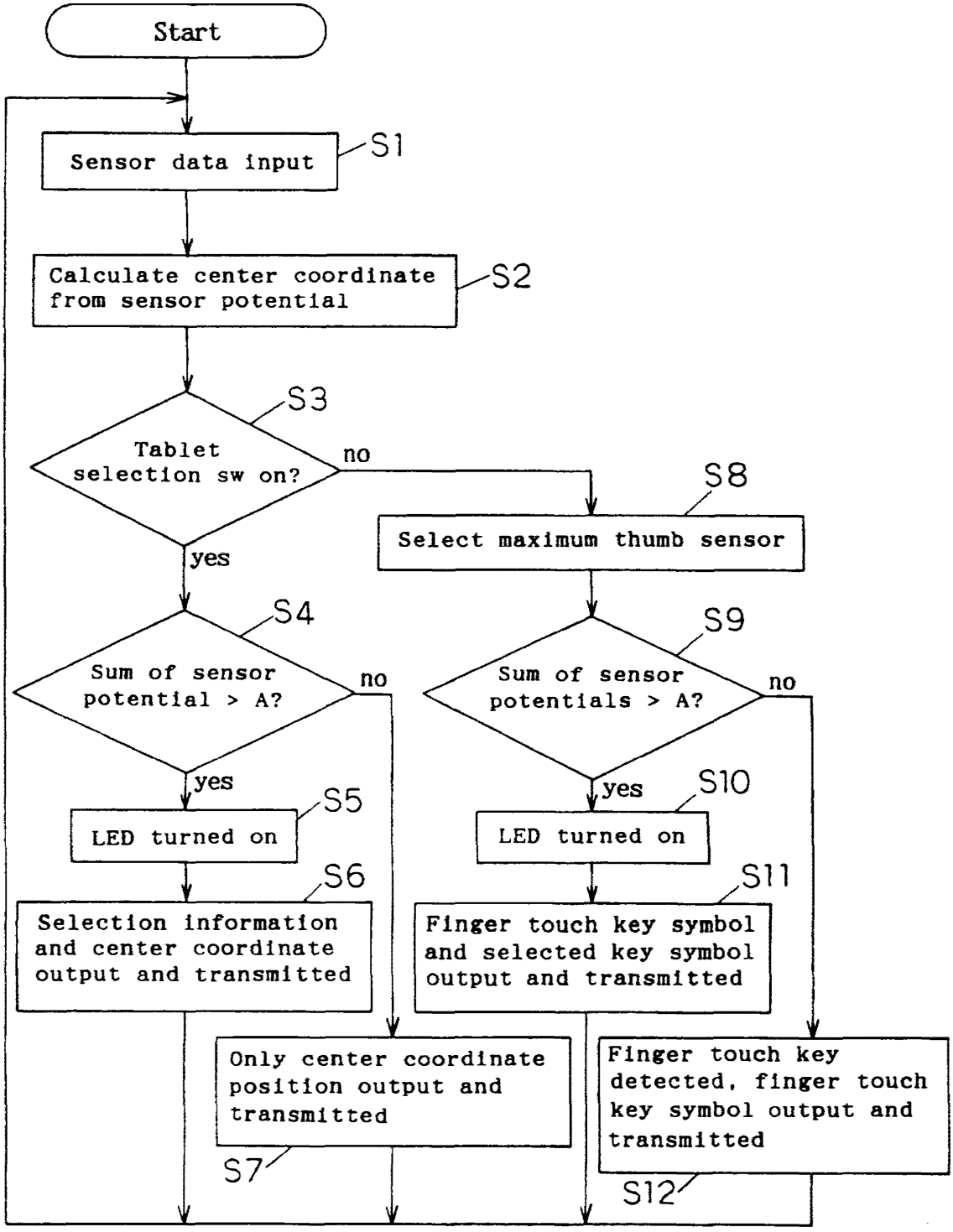


Fig. 55

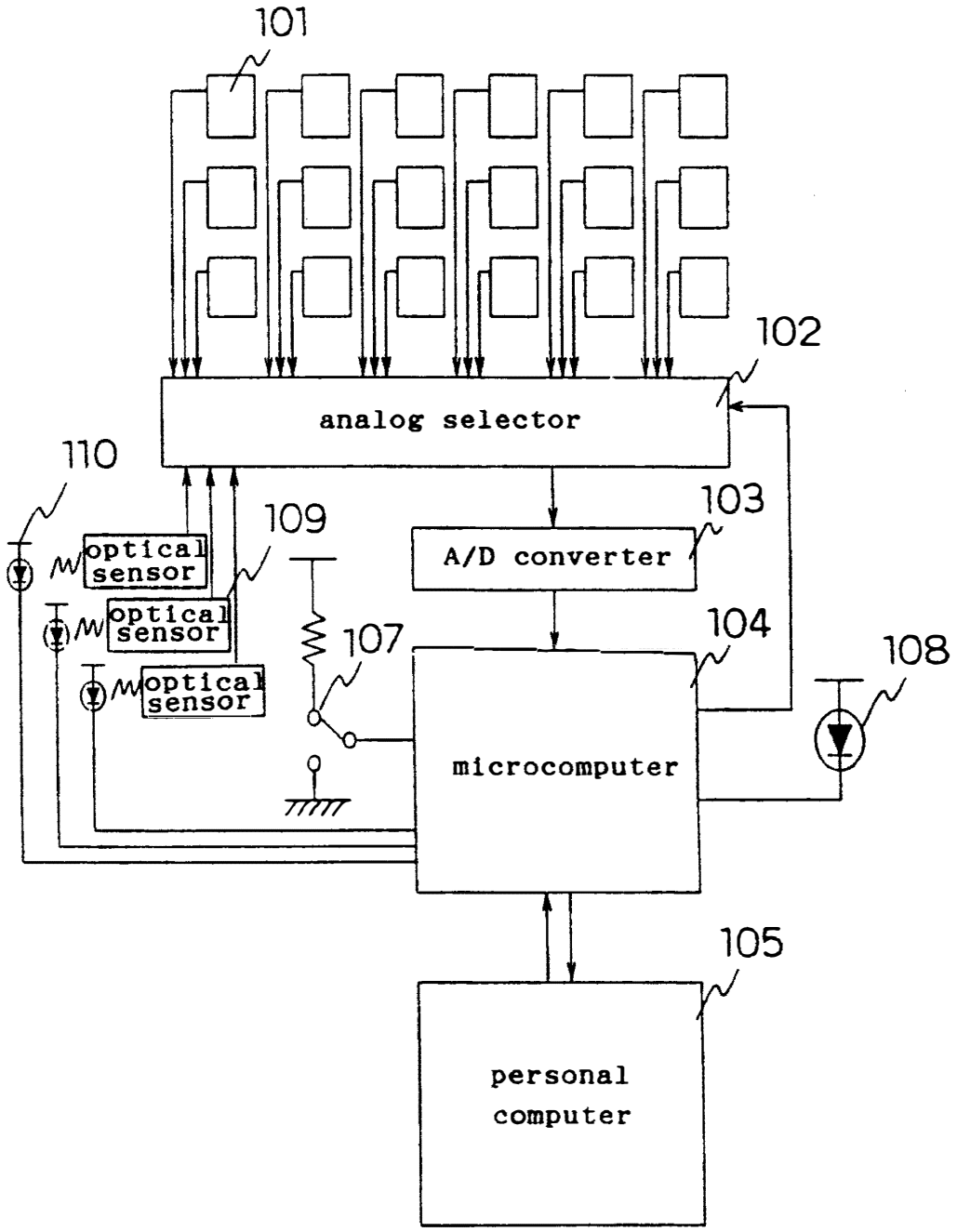


Fig. 56

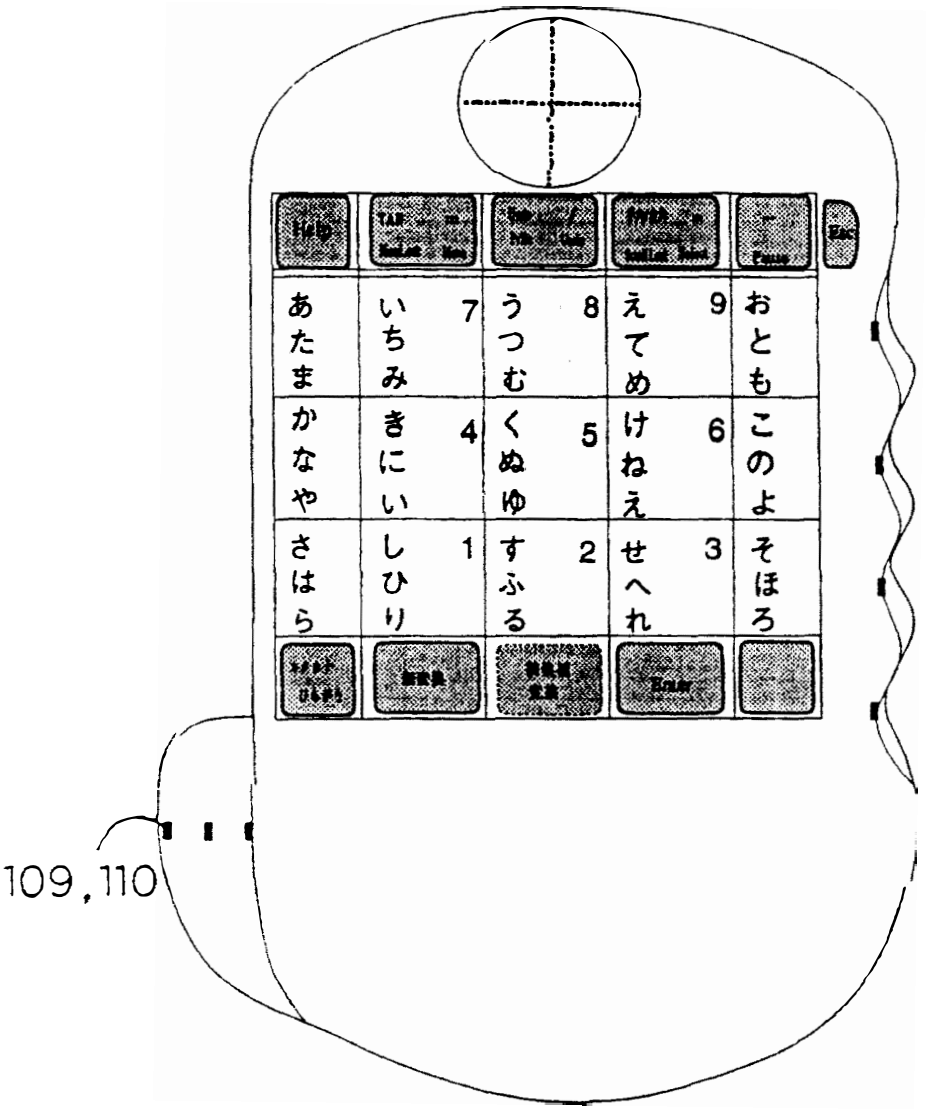


Fig. 57

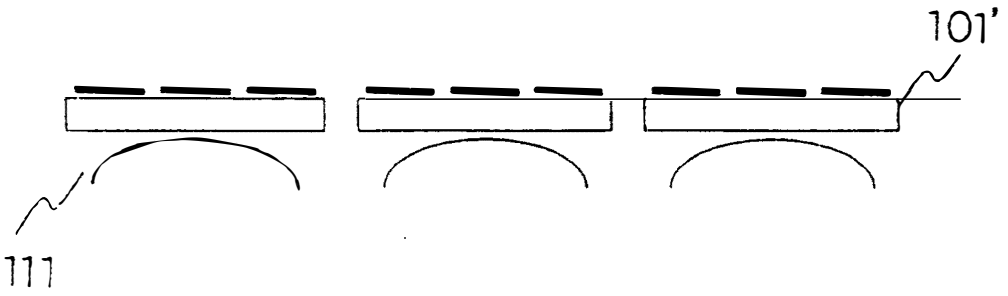


Fig. 58

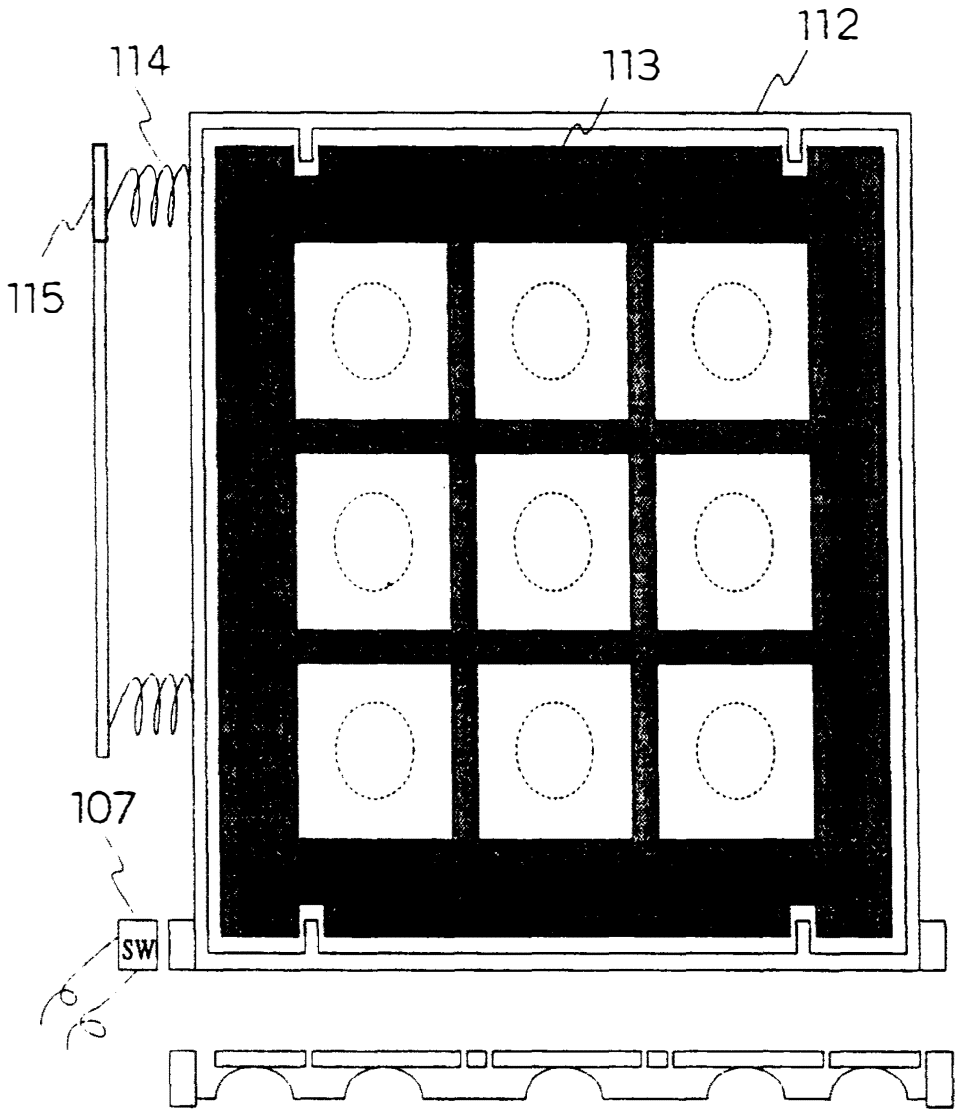


Fig. 59

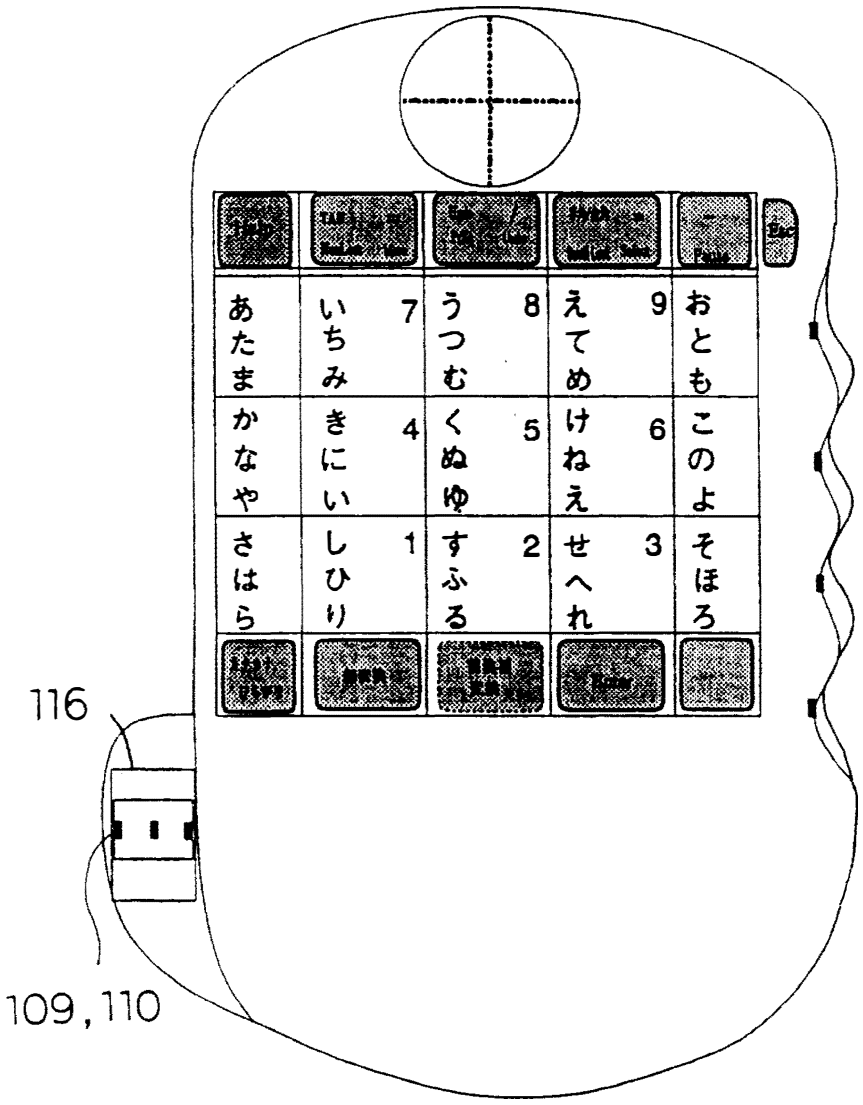


Fig. 60

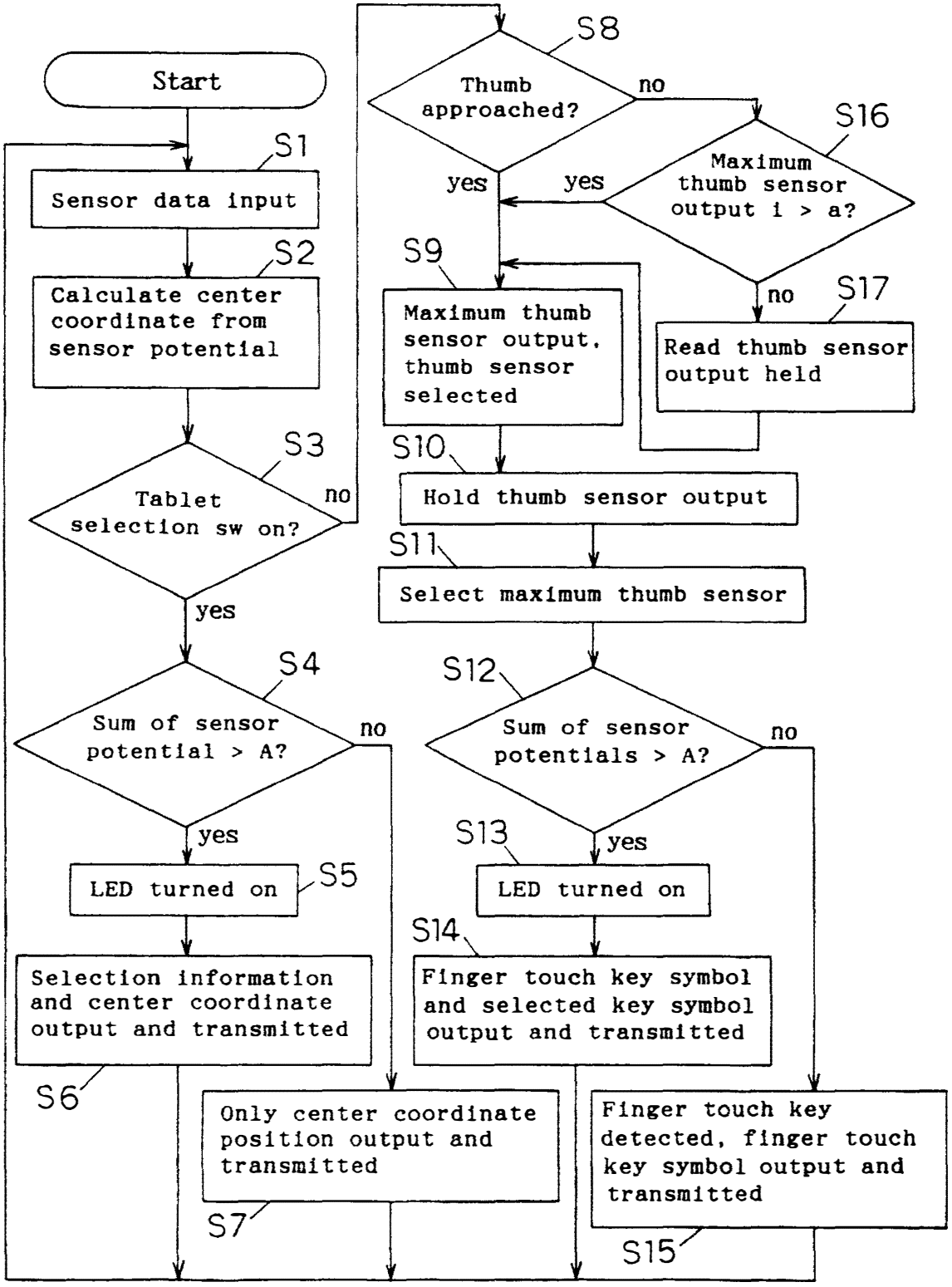


Fig. 61

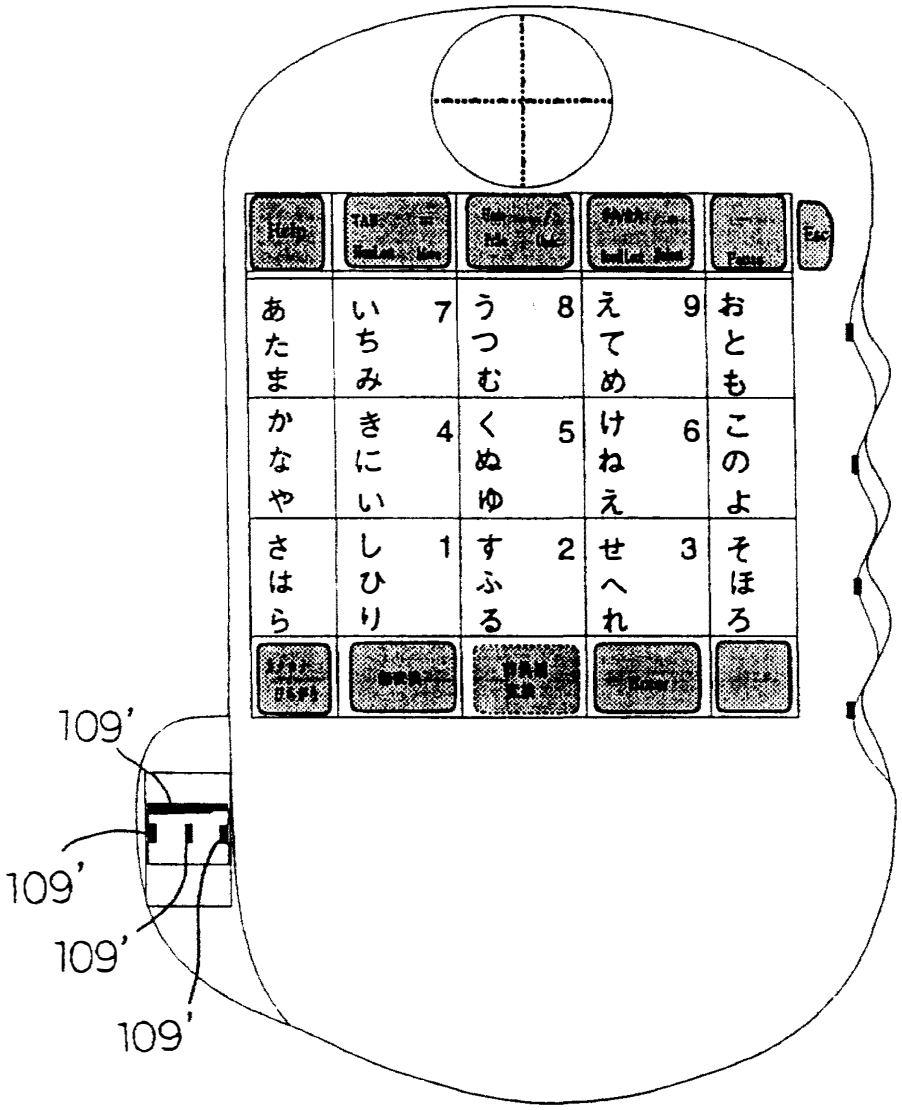


Fig. 62

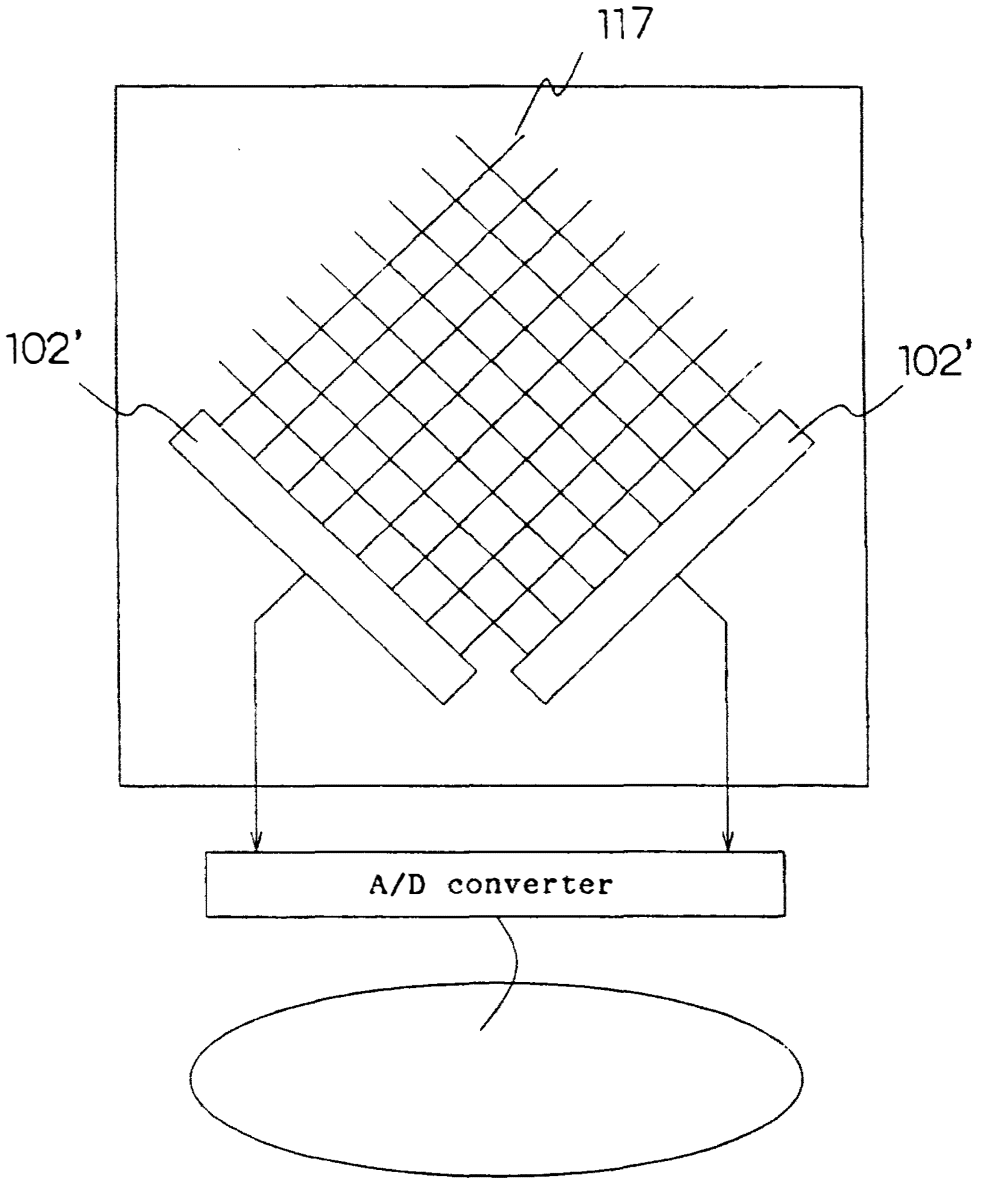


Fig. 63

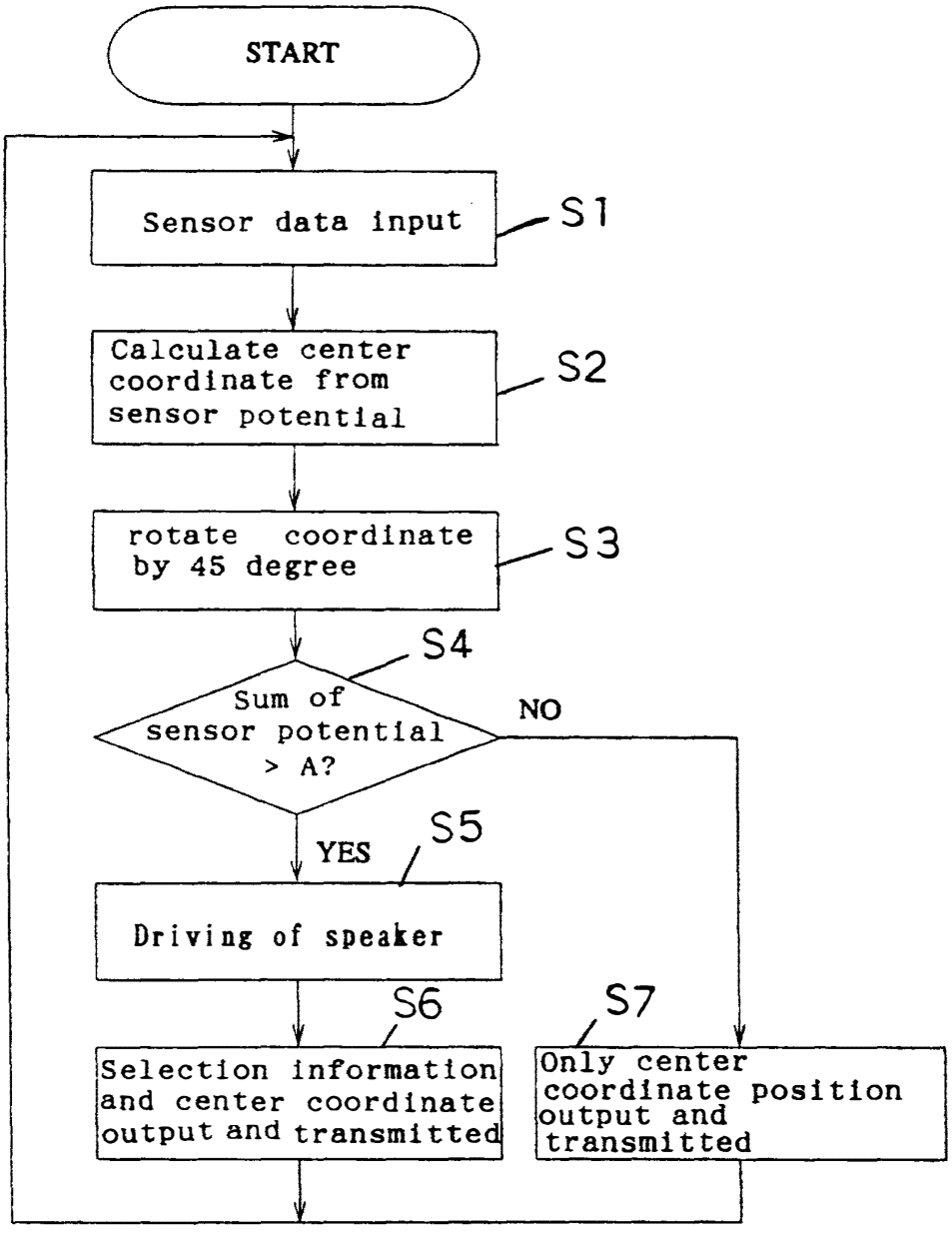
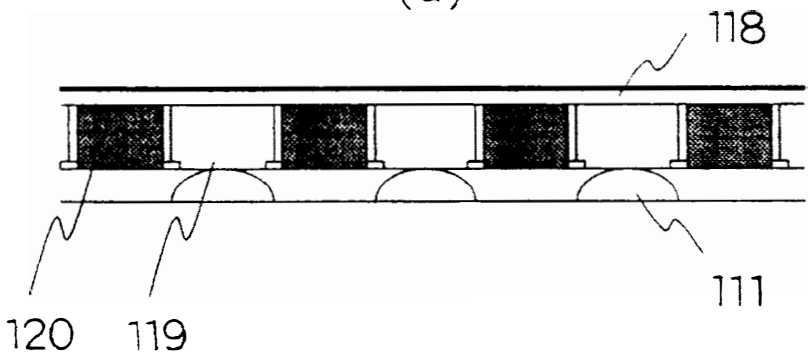


Fig. 64

(a)



(b)

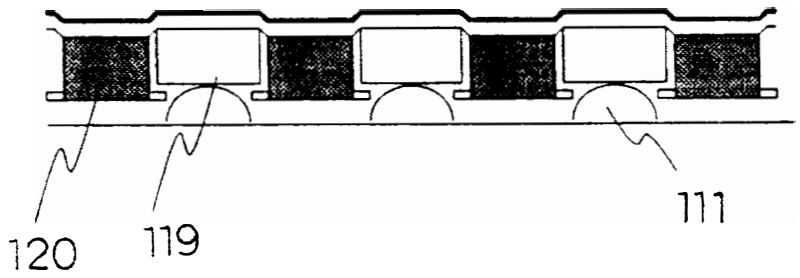


Fig. 65

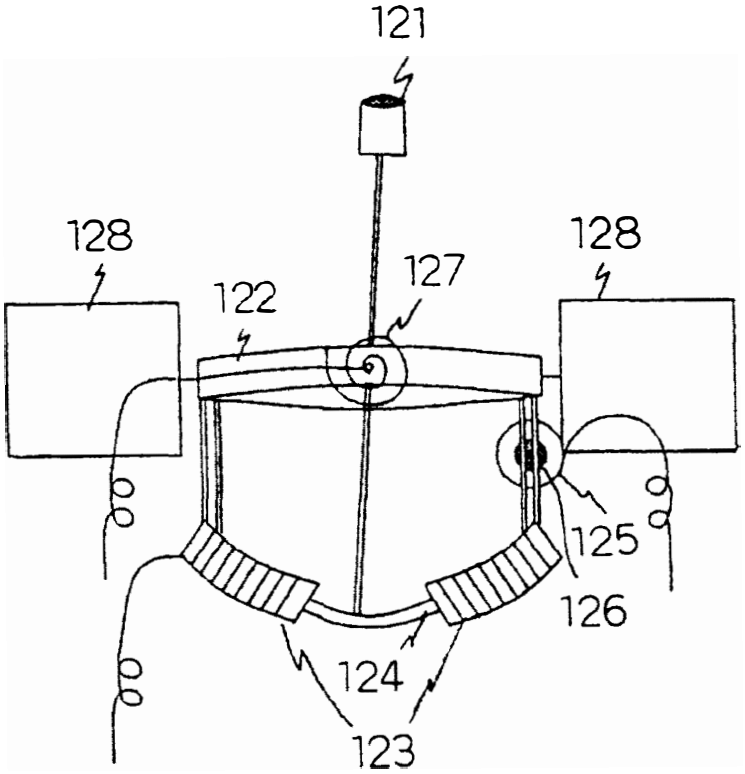


Fig. 66

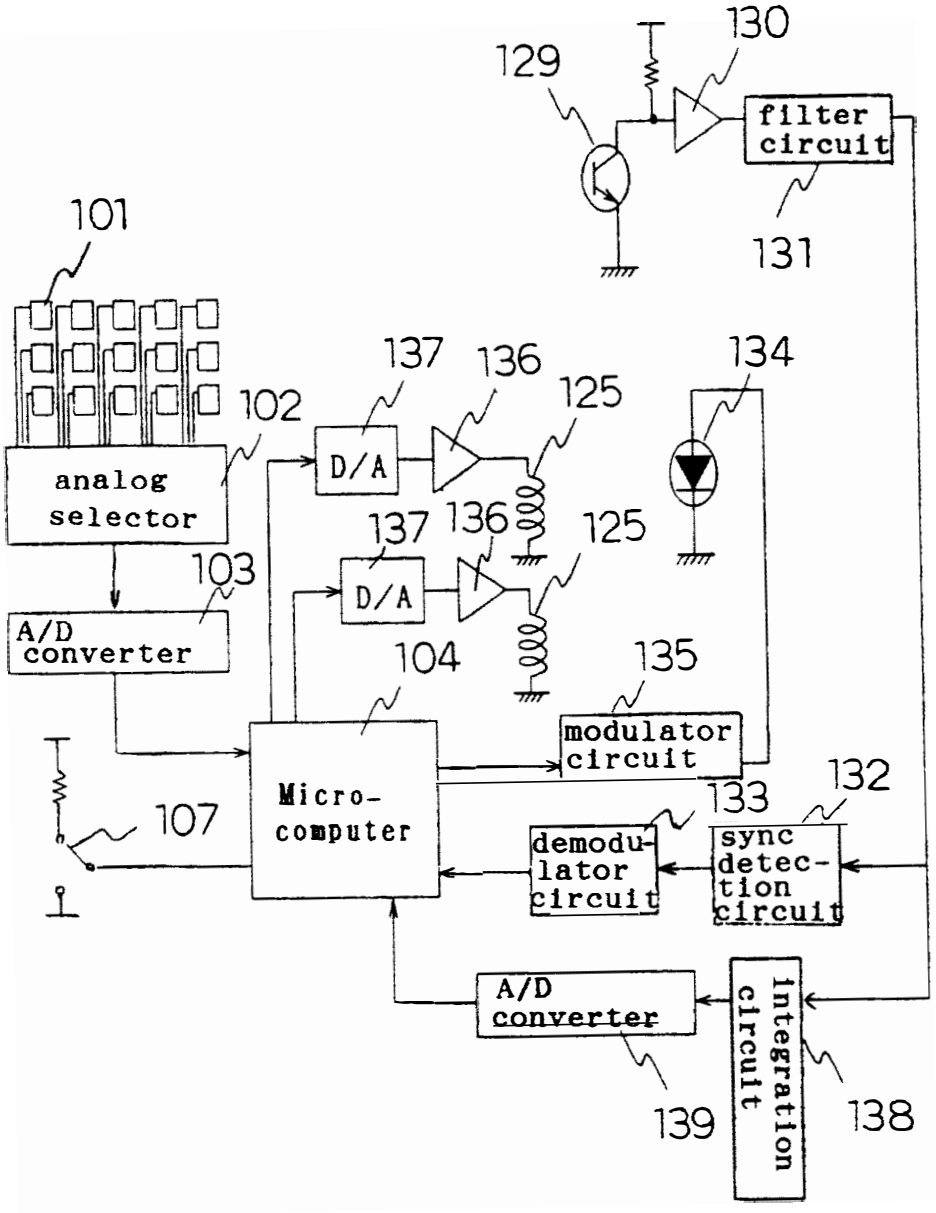


Fig. 67

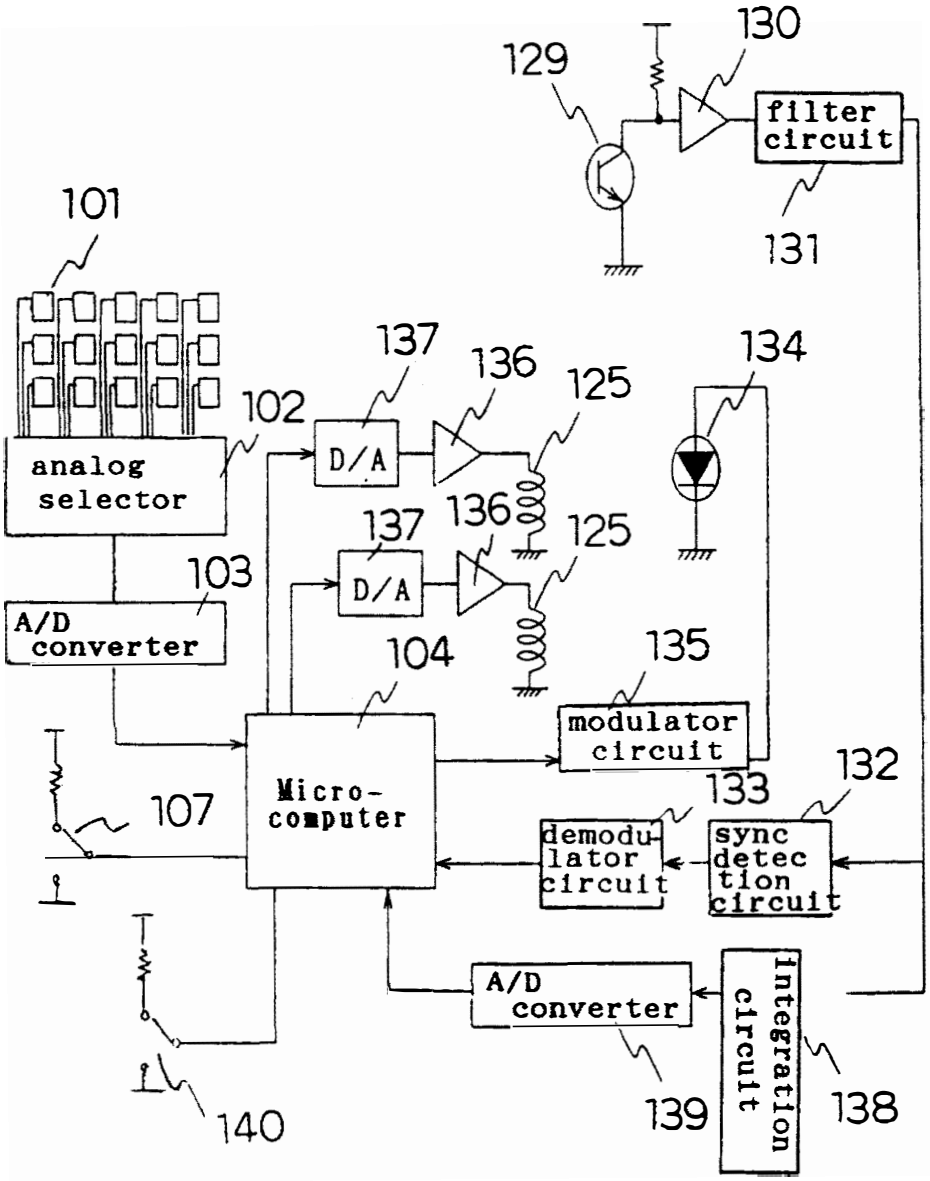


Fig. 68

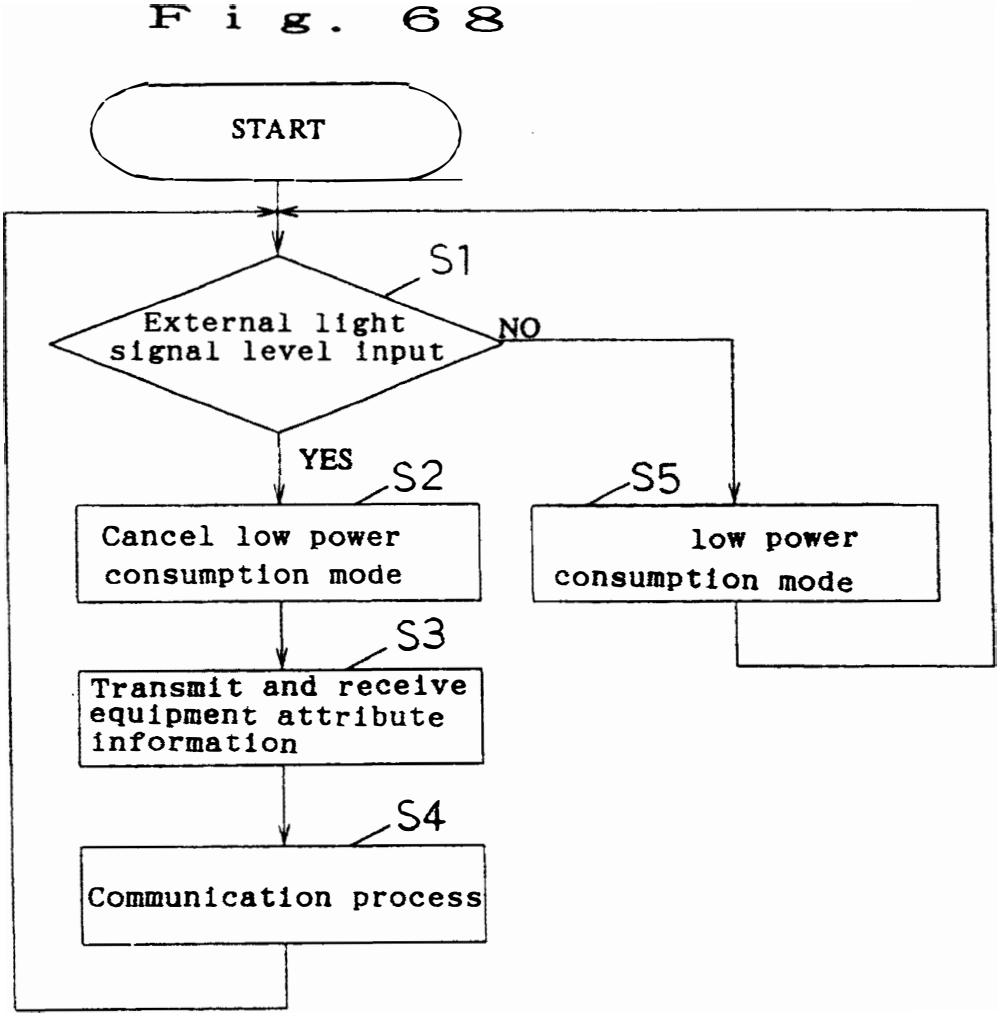


Fig. 69

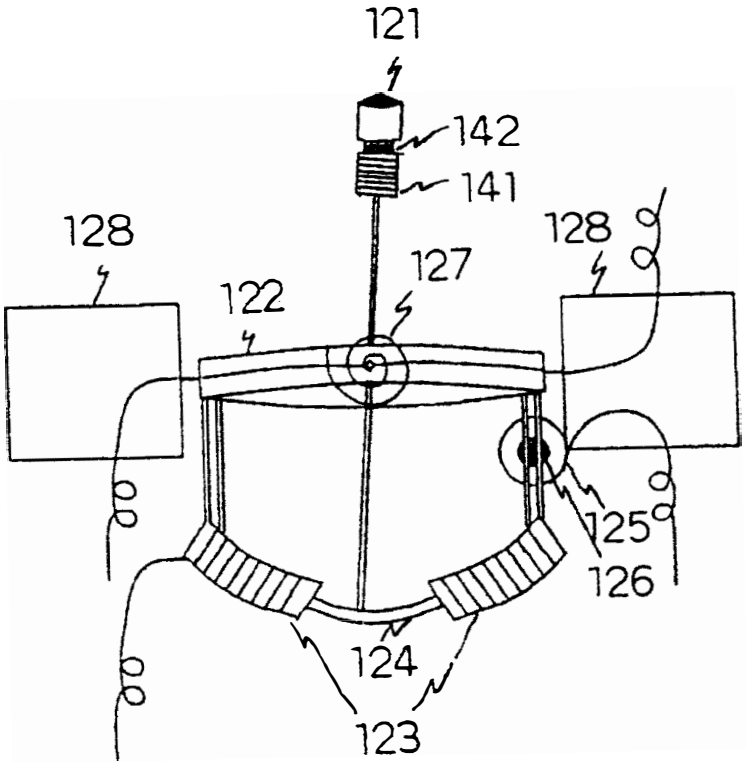


Fig. 70

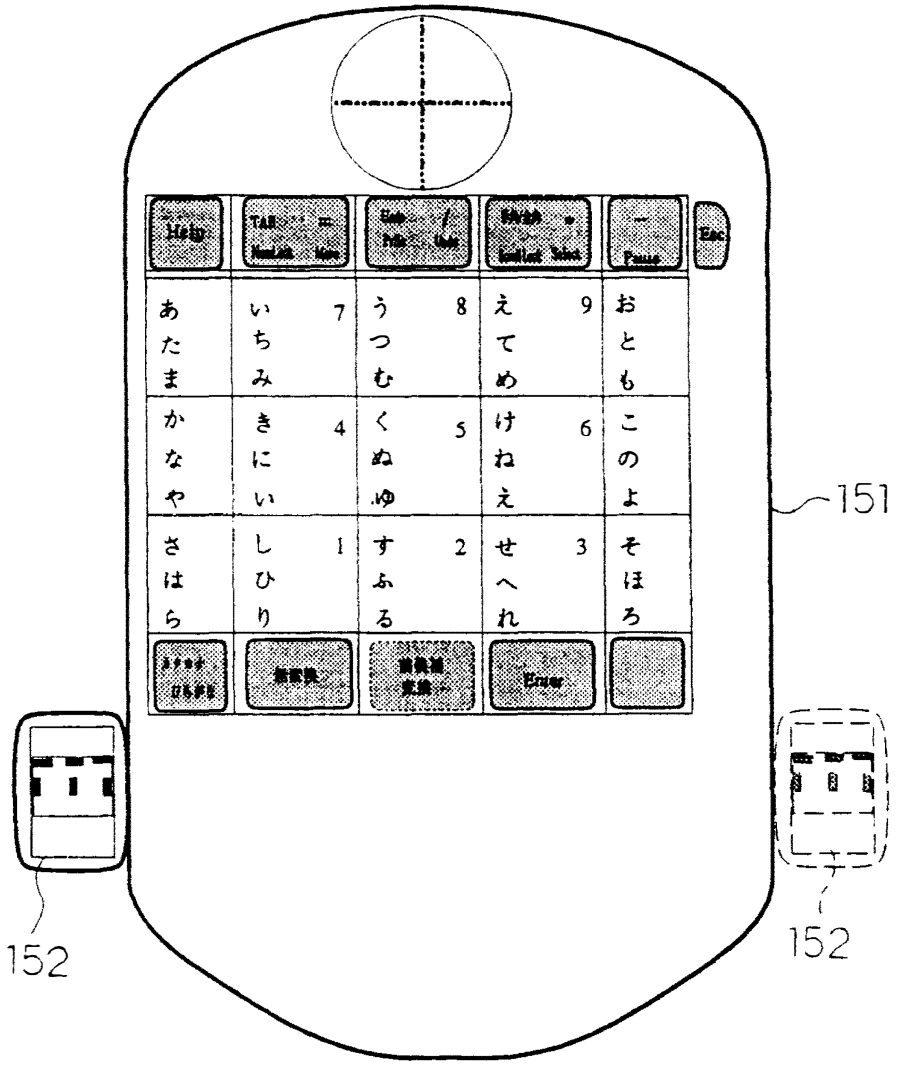
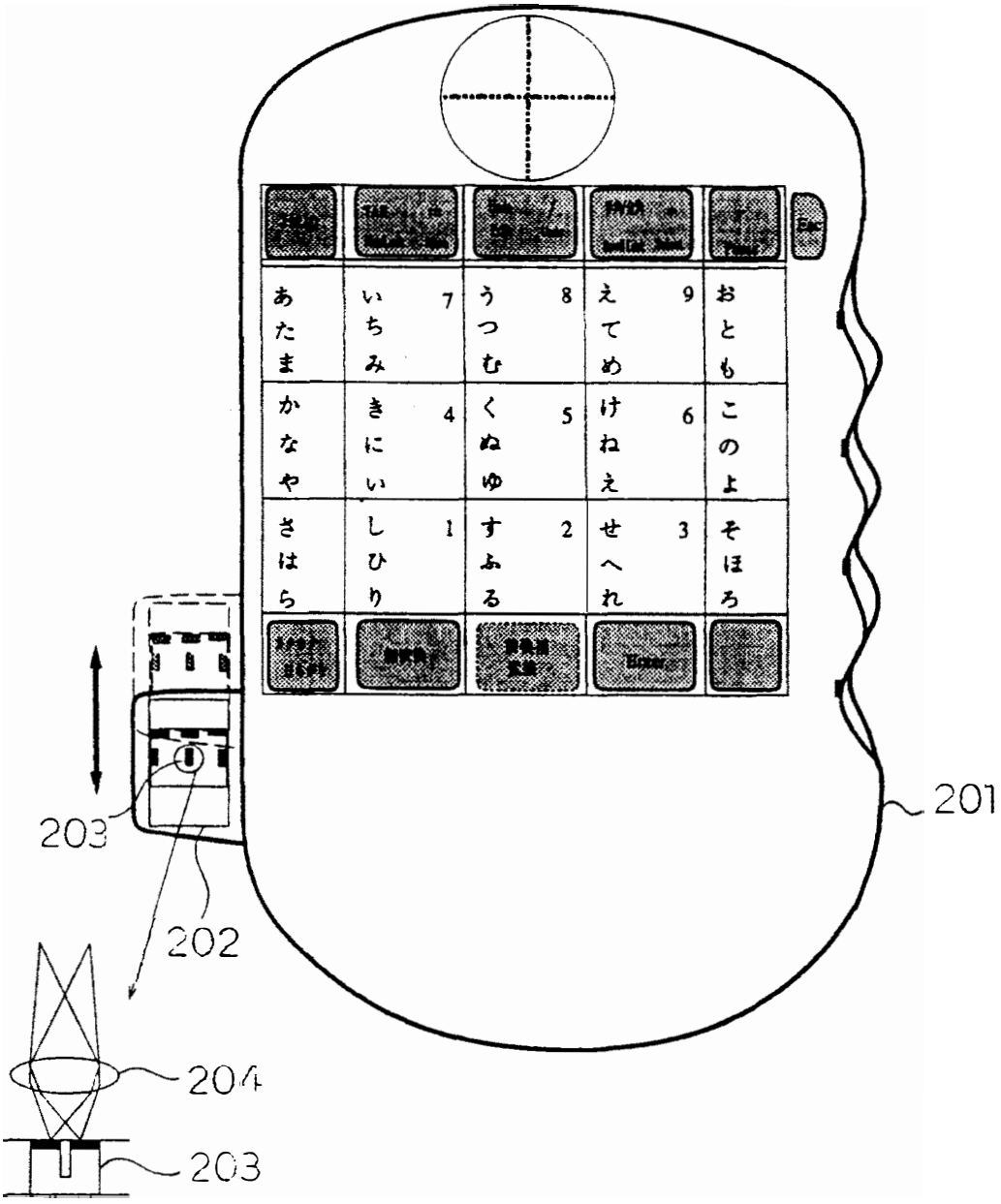
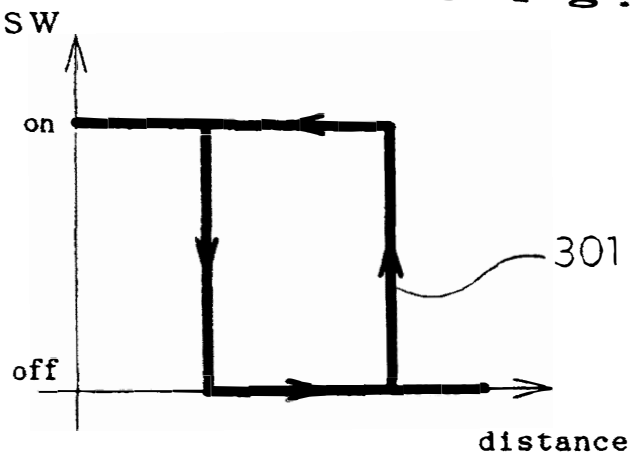


Fig. 71



side view

Fig. 72



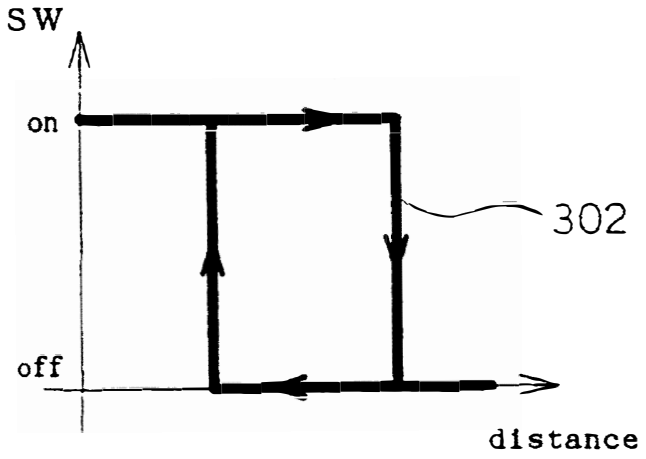
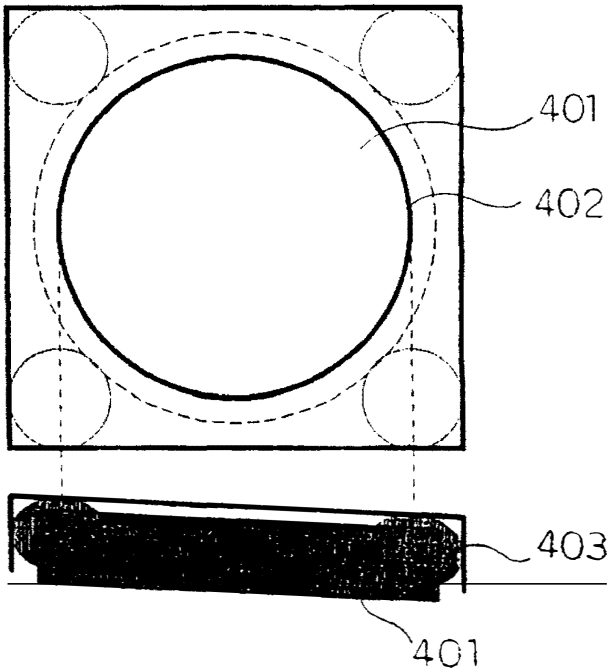
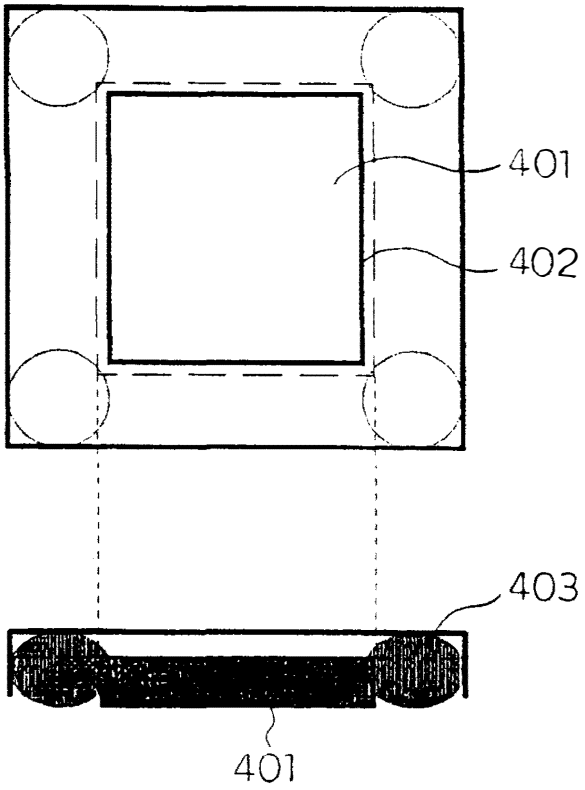


Fig. 73



(a)



(b)

Fig. 74

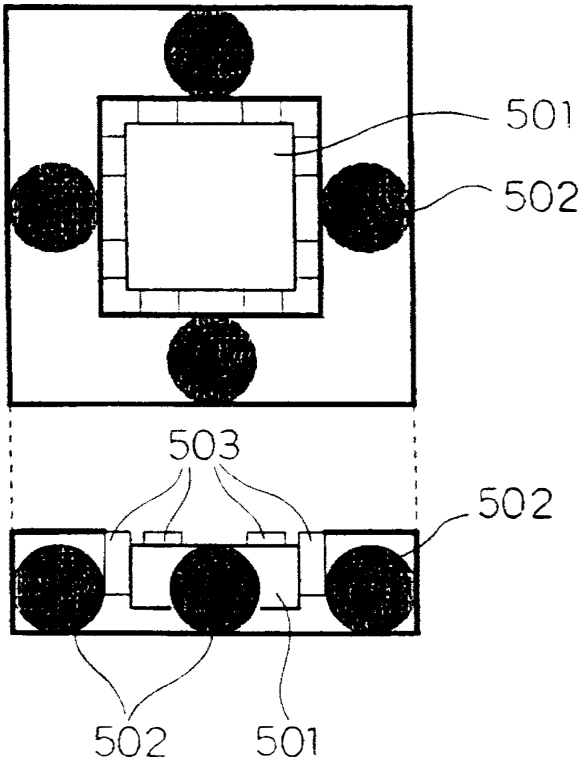


Fig. 75

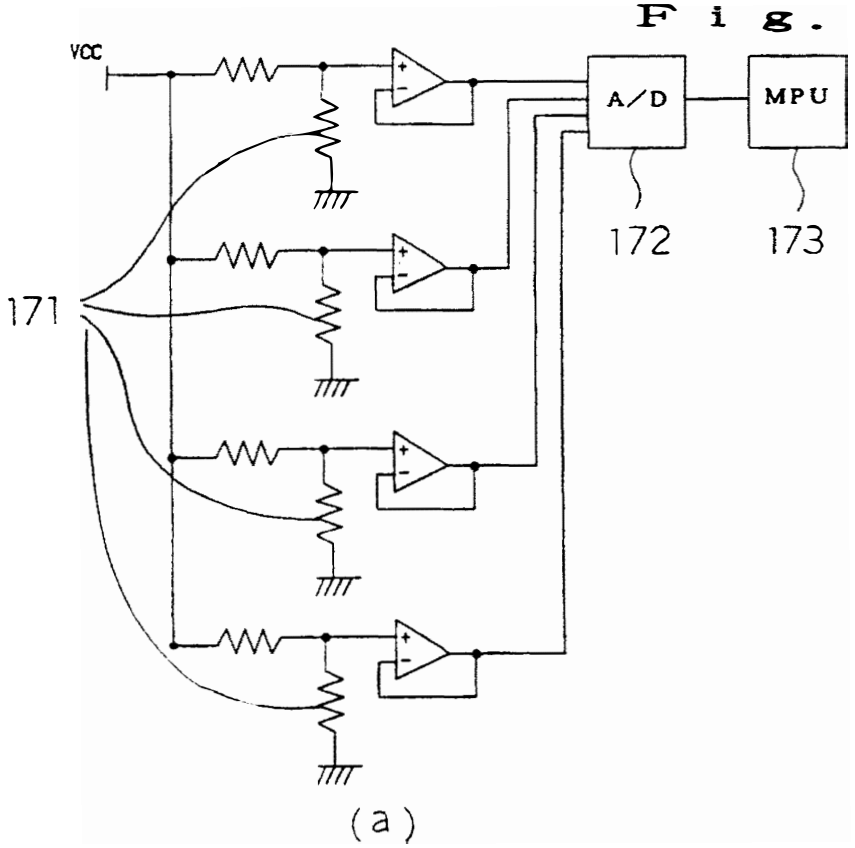


Fig. 76

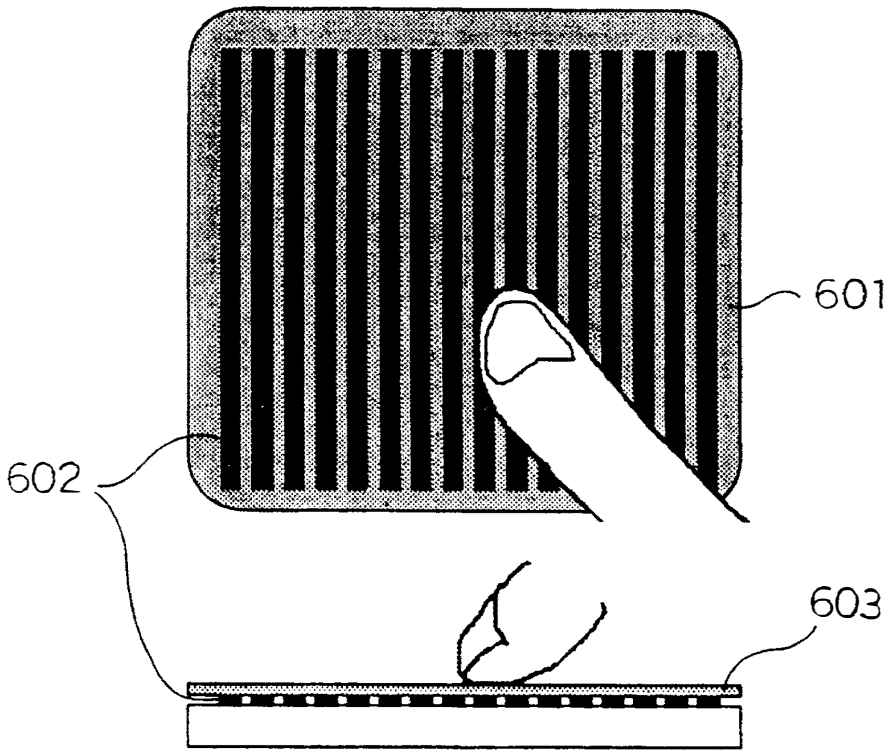


Fig. 77

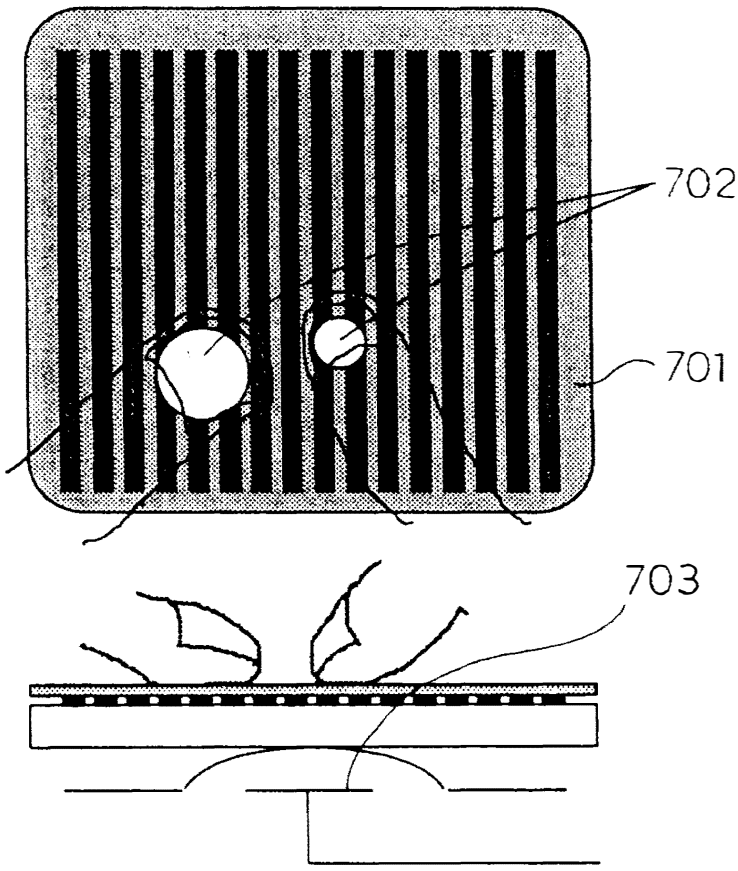


Fig. 78

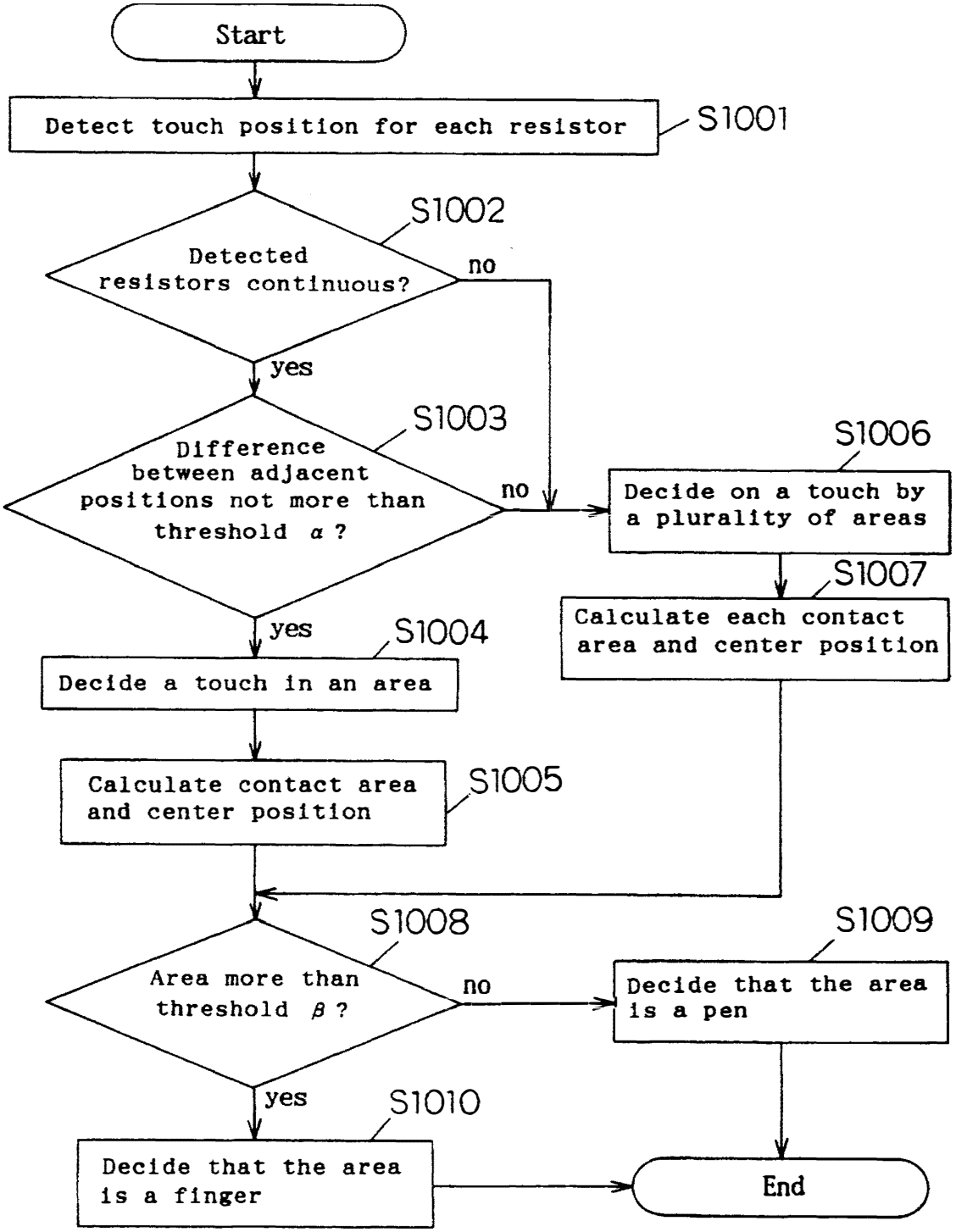


Fig. 79

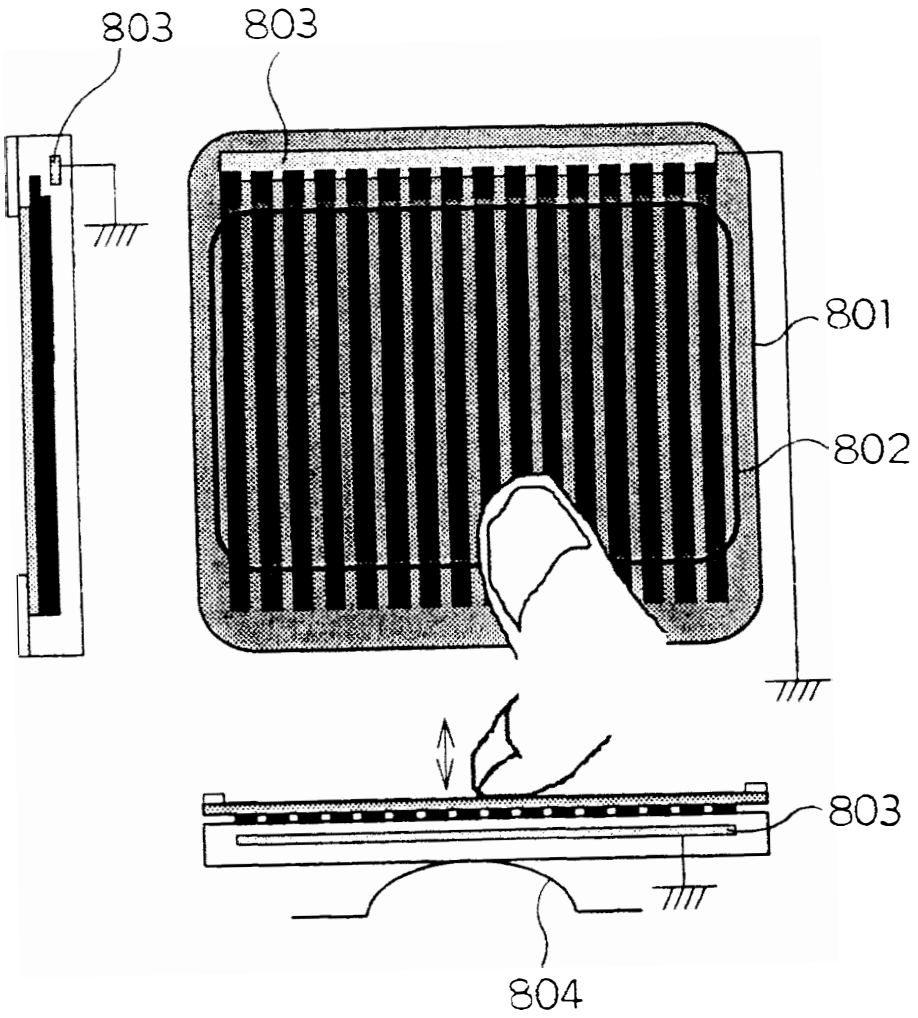


Fig. 80

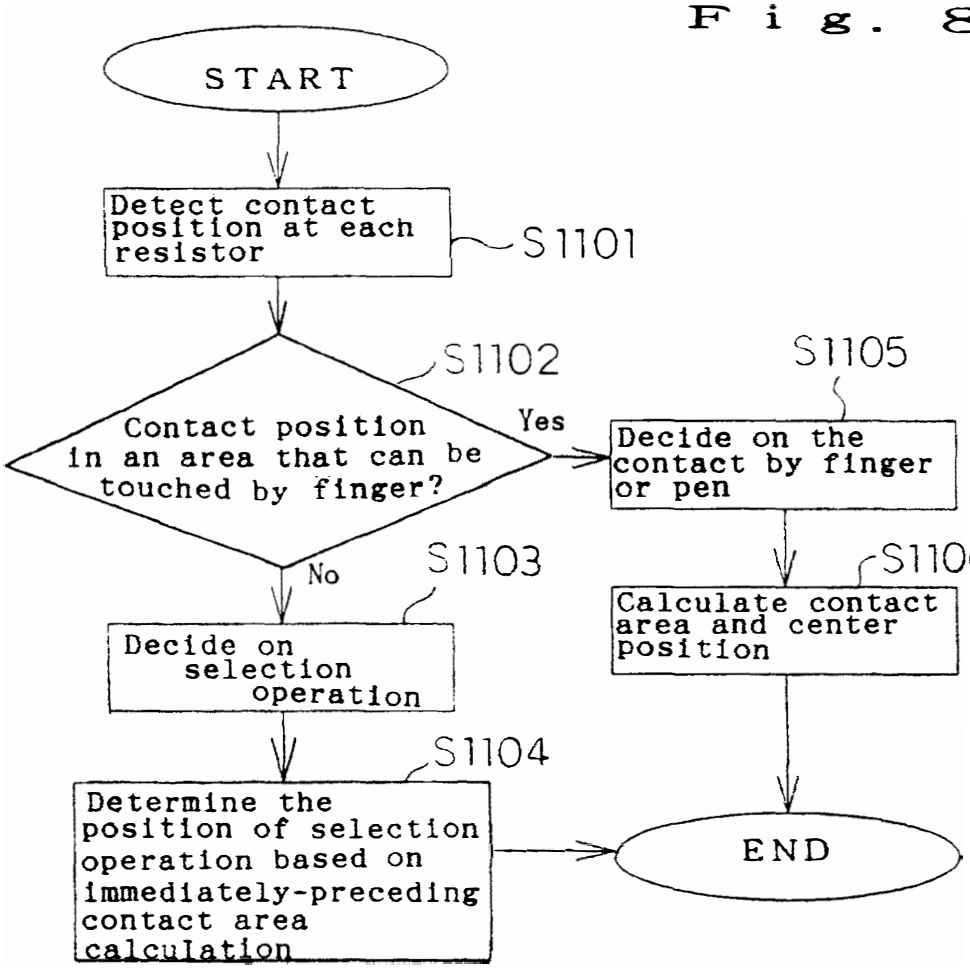


Fig. 81

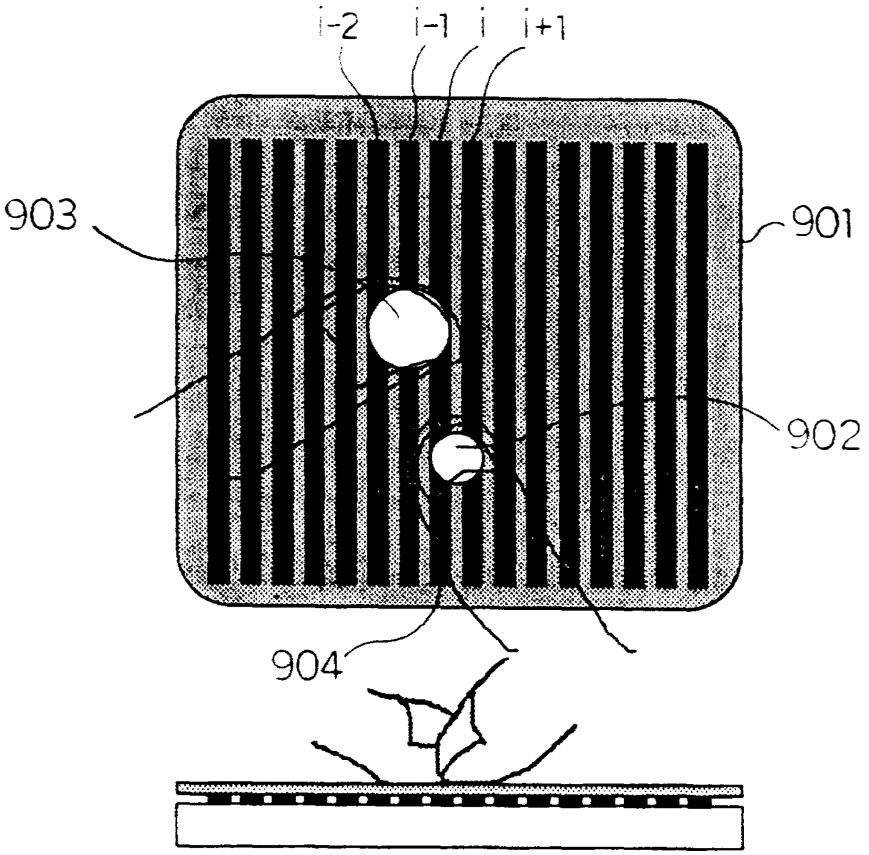


Fig. 82

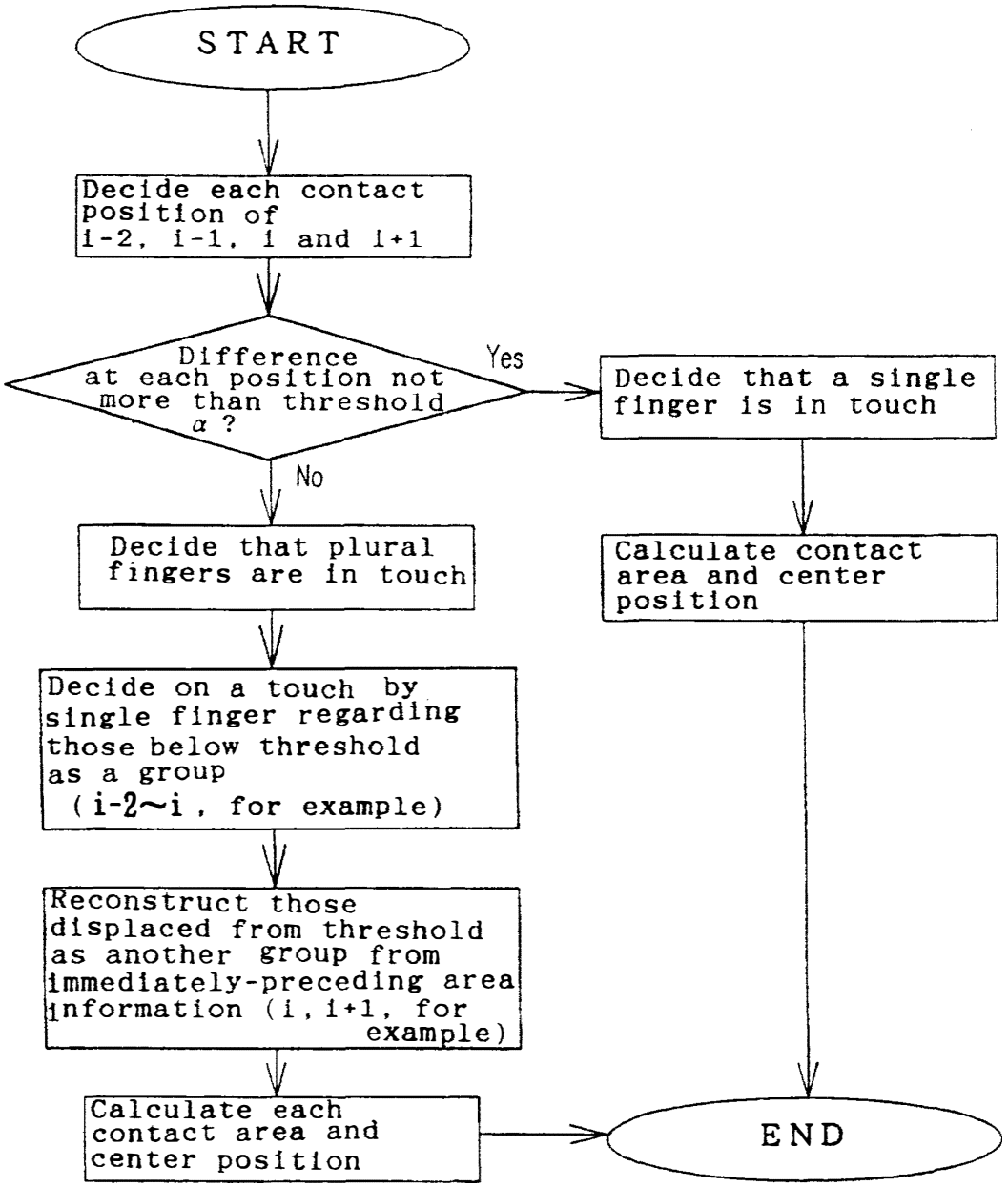


Fig. 83

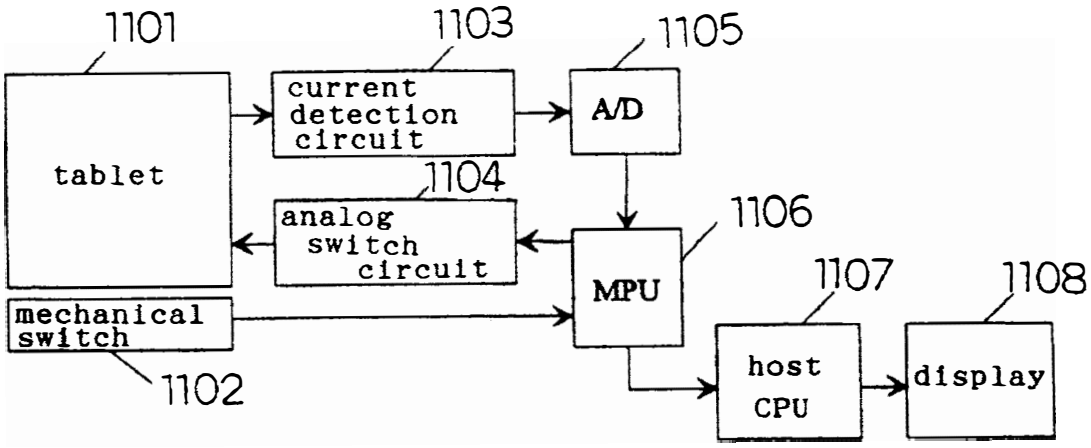


Fig. 84

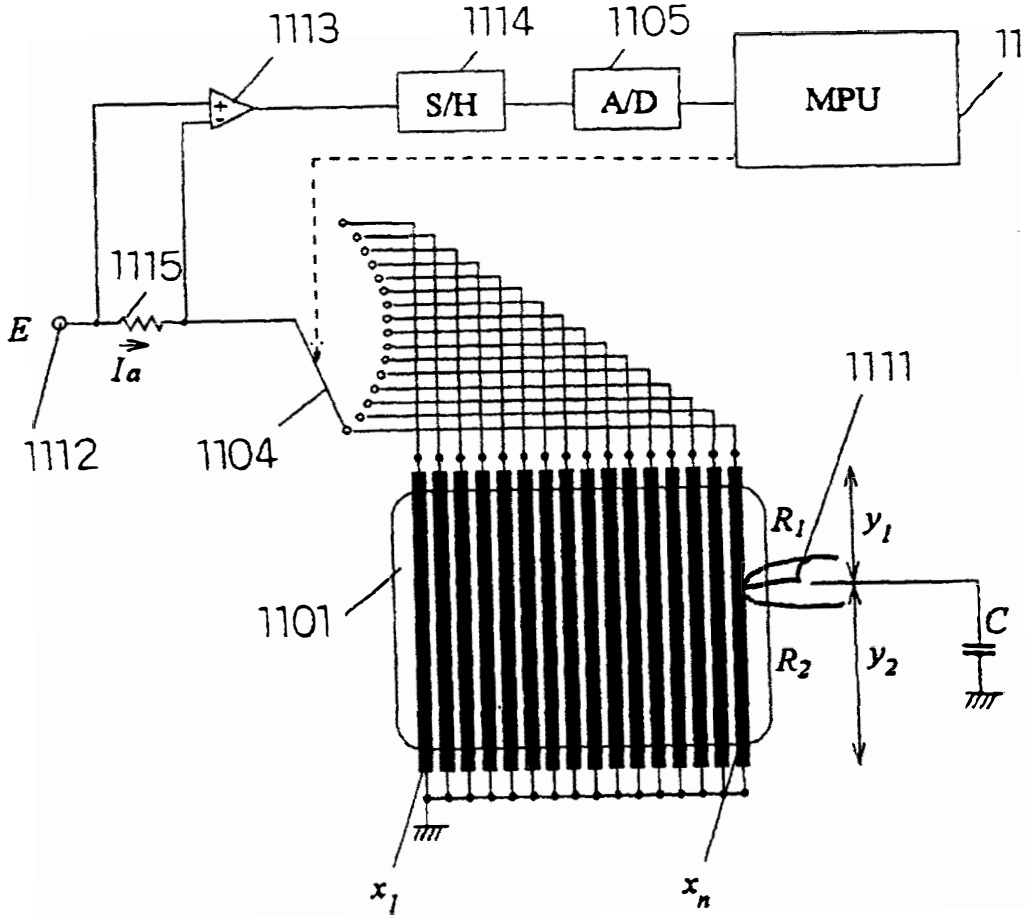


Fig. 85

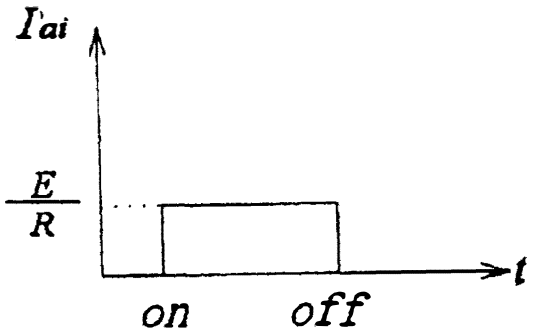


Fig. 86

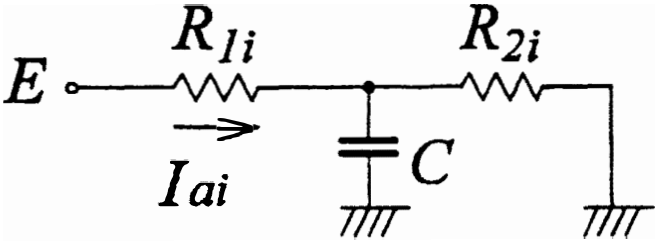


Fig. 87

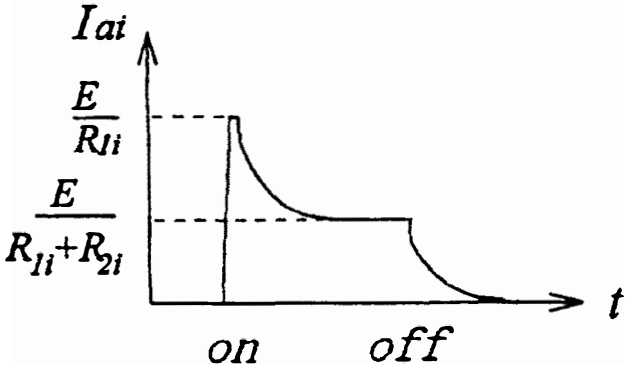


Fig. 88

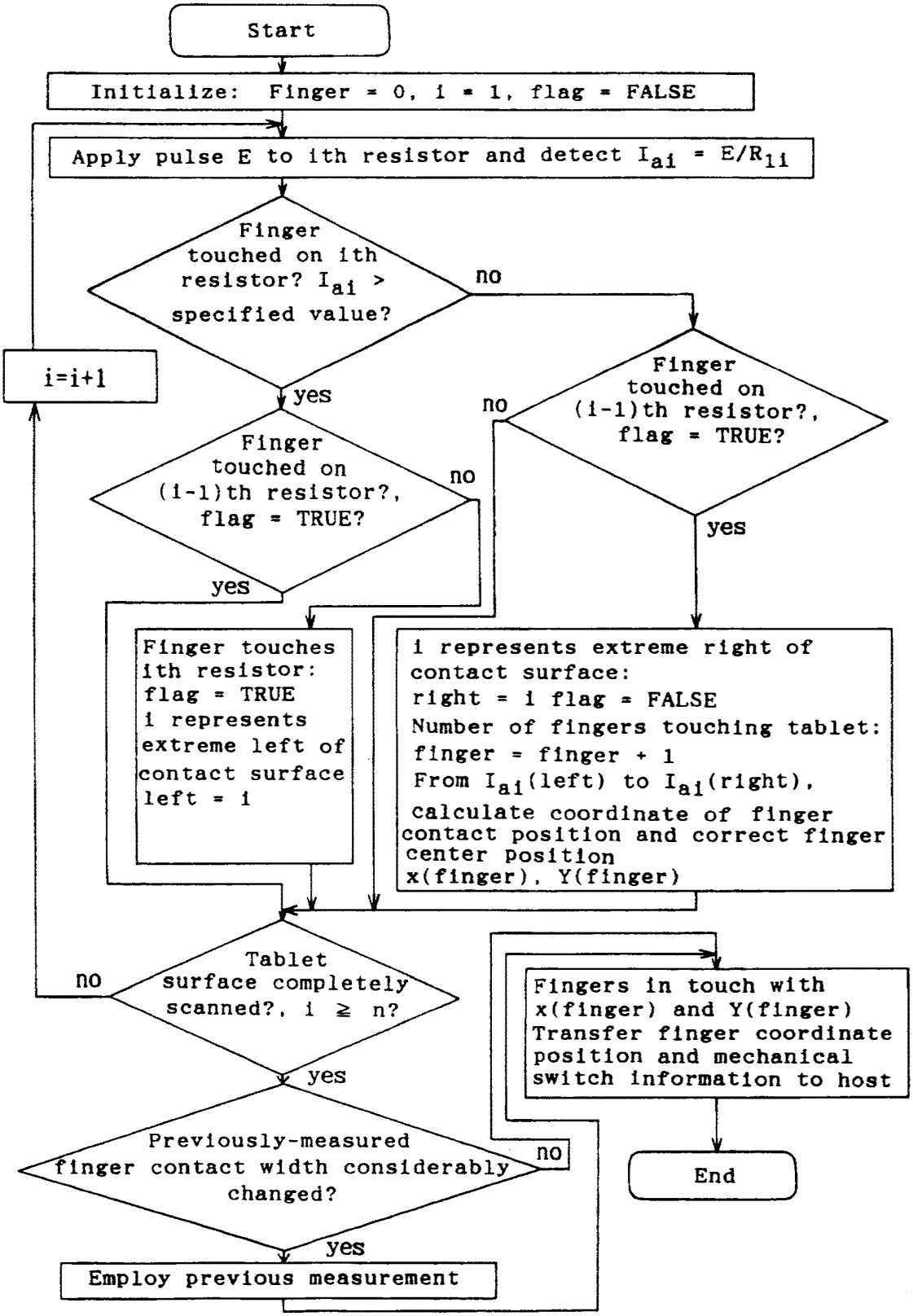


Fig. 89

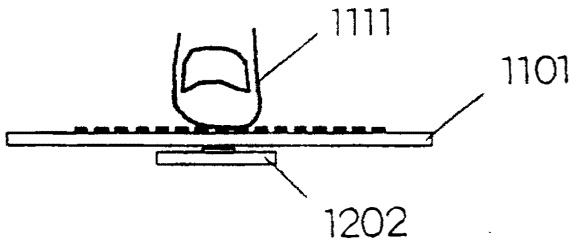


Fig. 91

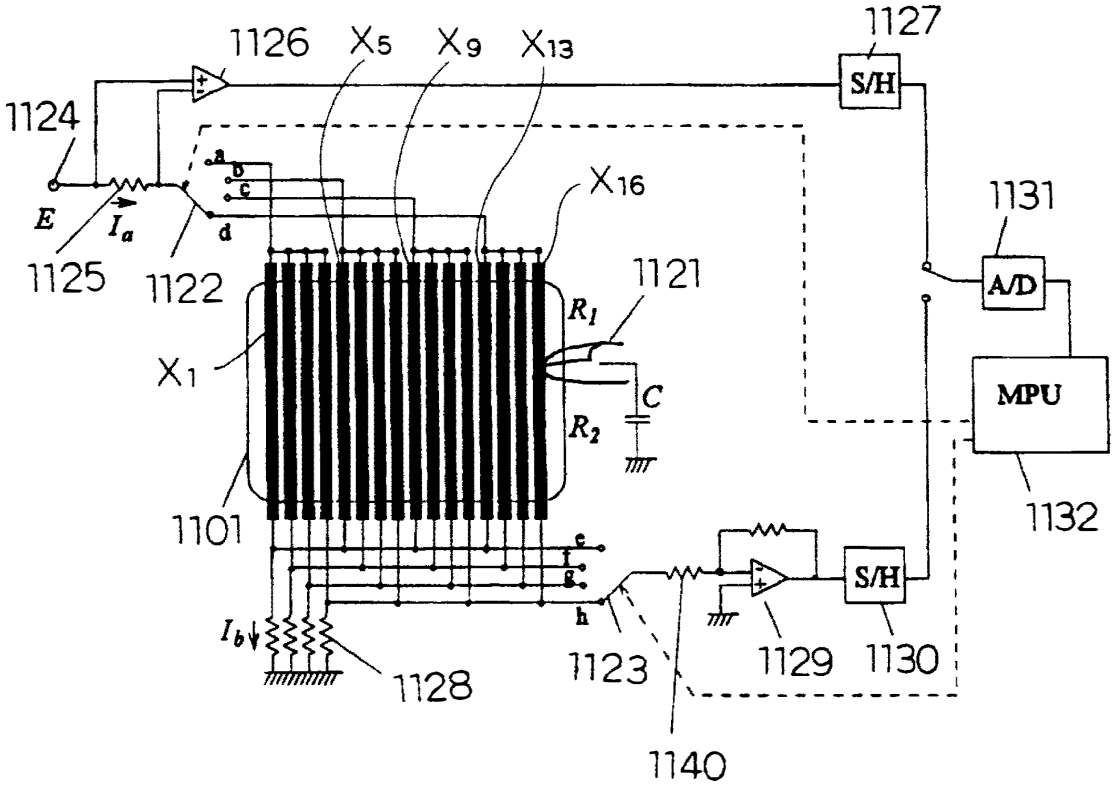


Fig. 90

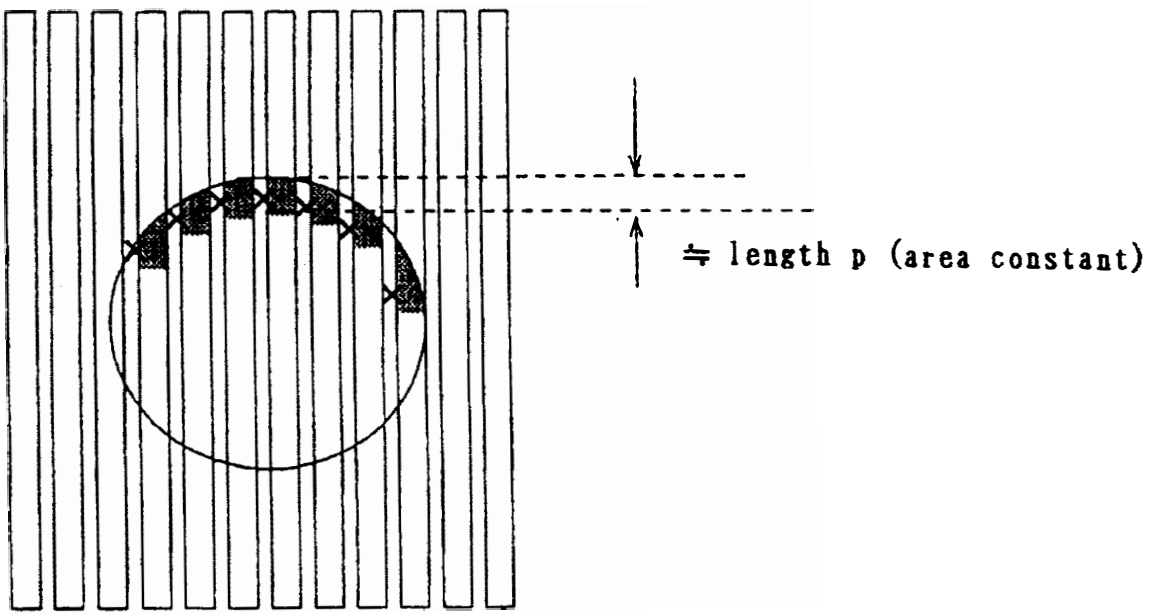


Fig. 92

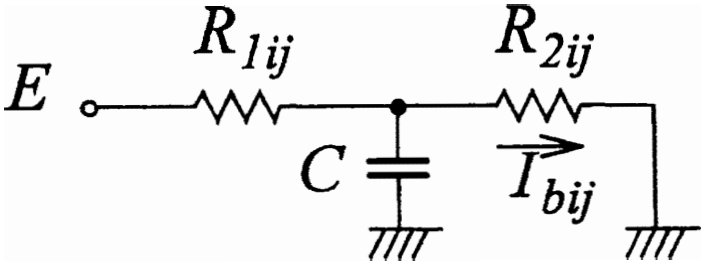


Fig. 93

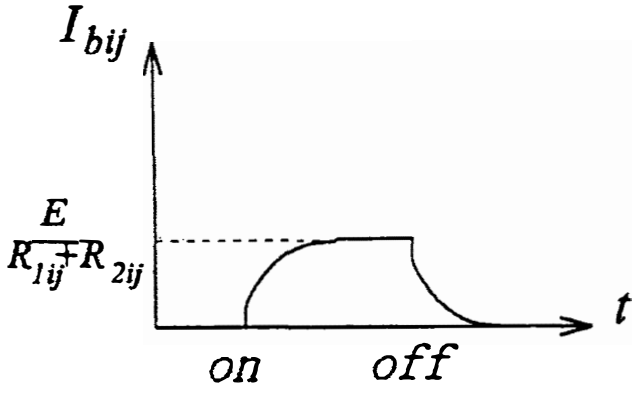


Fig. 94

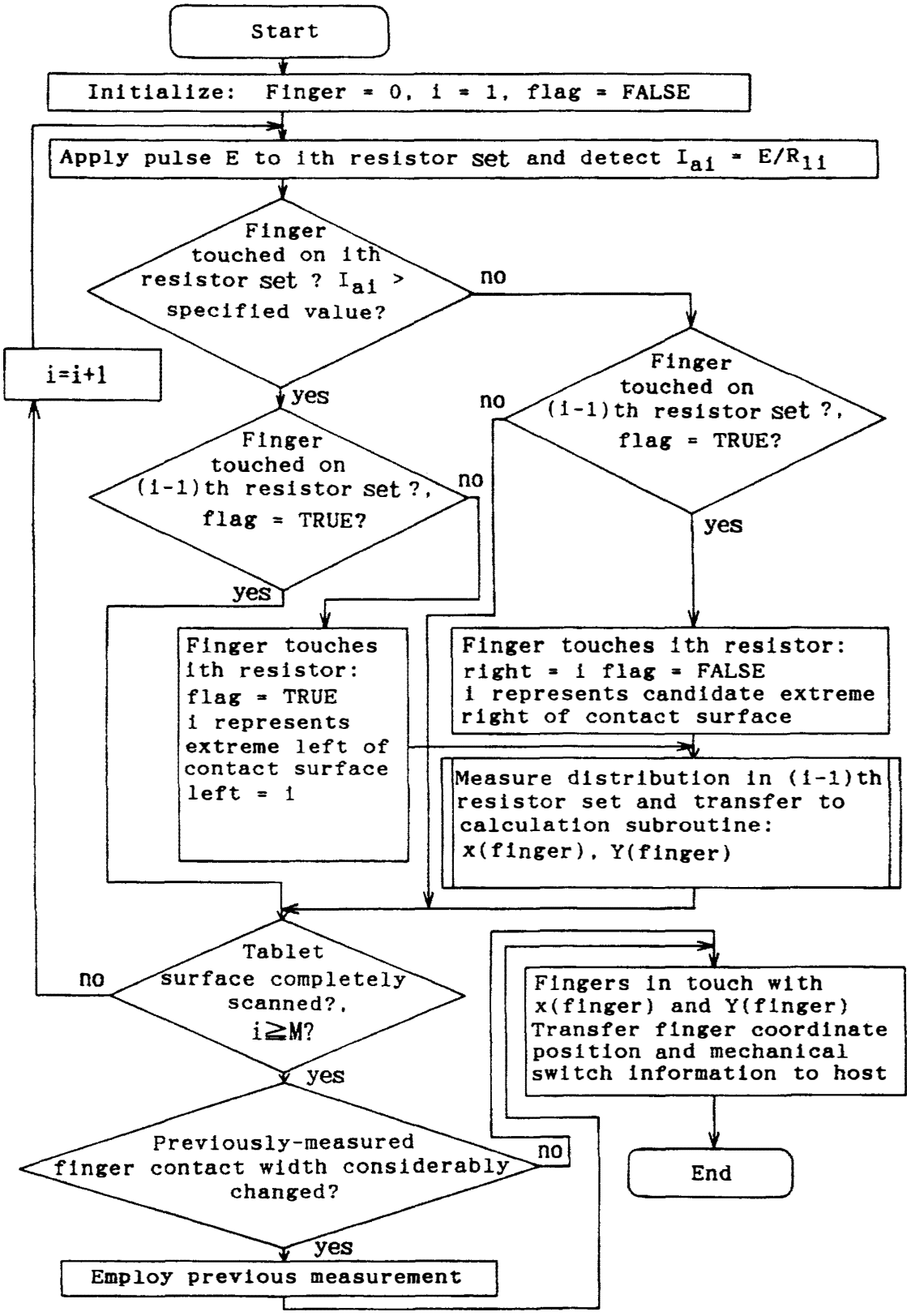


Fig. 95

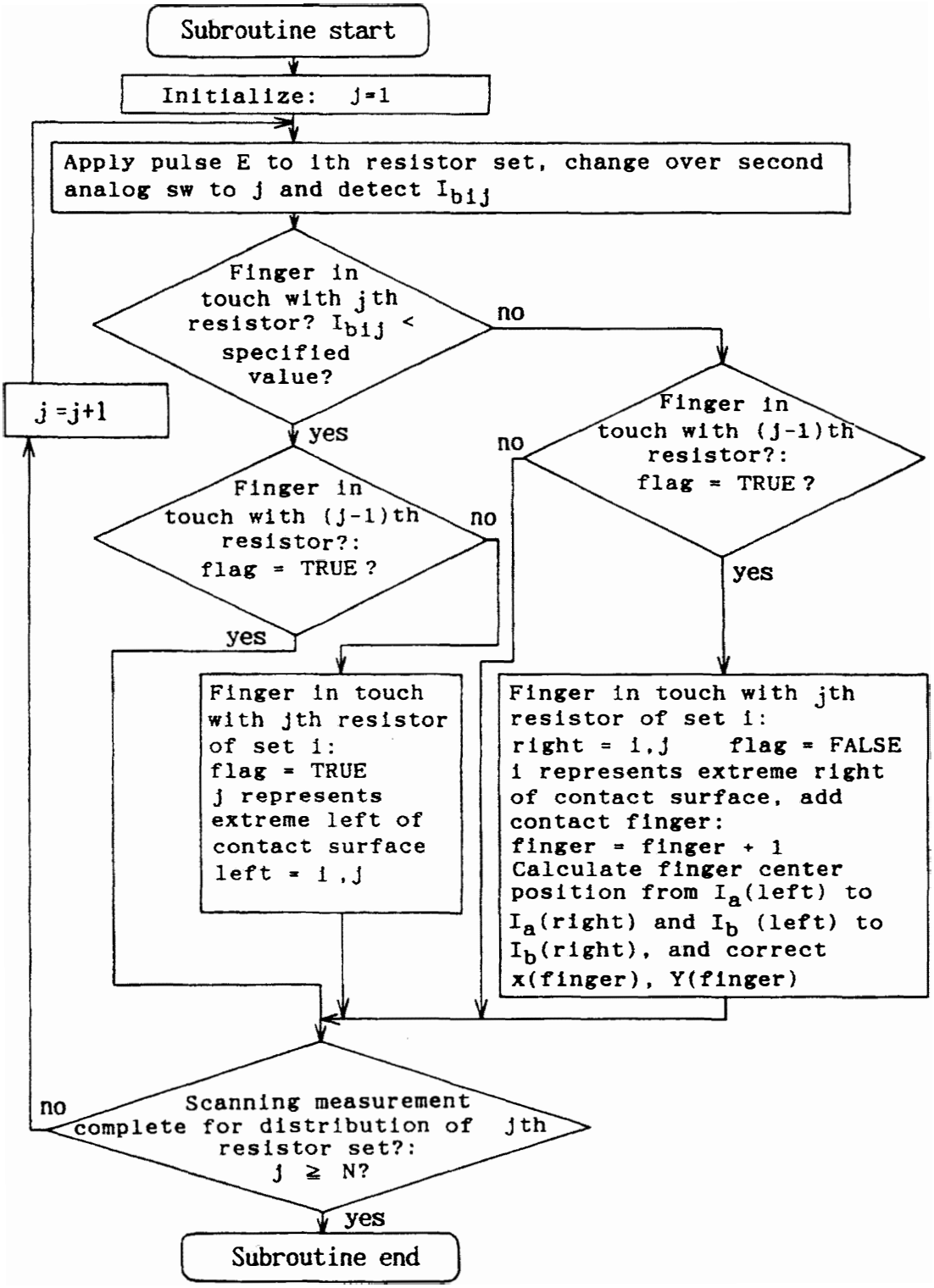


Fig. 96

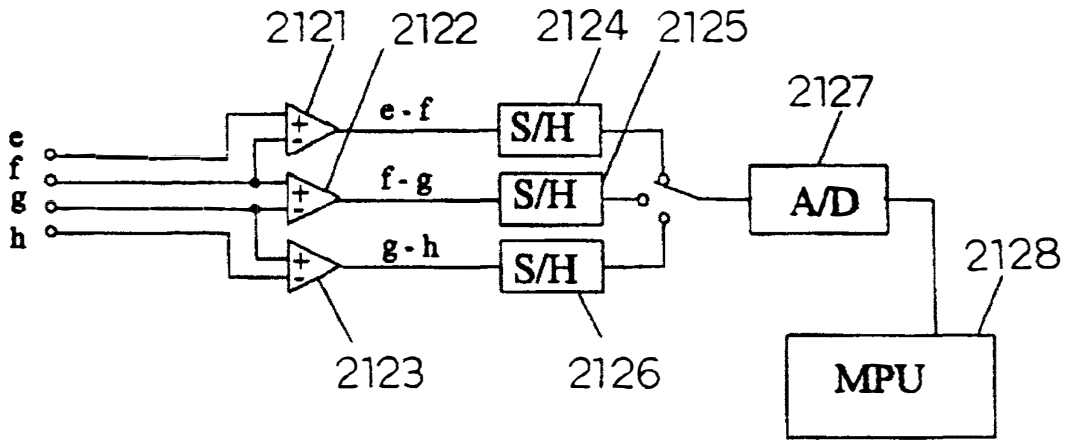
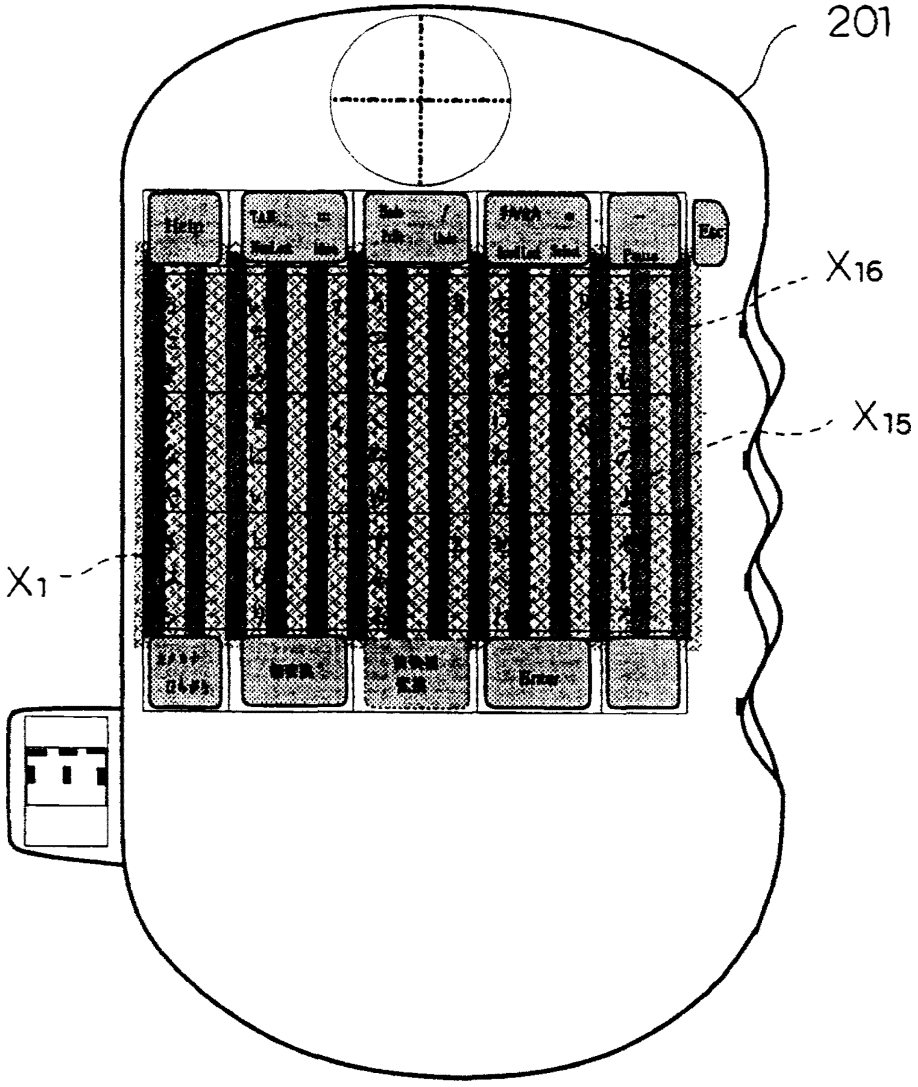


Fig. 97



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP95/00062

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl^6 G06F3/02
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)
Int. Cl^6 G06F3/02, G06F3/023

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1975 - 1994
Kokai Jitsuyo Shinan Koho 1975 - 1994

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP, A, 5-189110 (Fanuc Ltd.), July 7, 1993 (07. 07. 93)(Family: none)	1 - 64
A	JP, A, 5-11900 (Osamu Hirai), January 22, 1993 (22. 01. 93)(Family: none)	1 - 64
A	JP, A, 63-36322 (Laurent Guyot-Sionnest), February 17, 1988 (17. 02. 88) & FR, B1, 2585487 & EP, B1, 213022 & AT, E, 67907 & DE, C0, 3681660 & US, A, 5087910	1 - 64

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
April 25, 1995 (25. 04. 95)	May 23, 1995 (23. 05. 95)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

Electronic Patent Application Fee Transmittal

Application Number:	11279402
Filing Date:	12-Apr-2006
Title of Invention:	CAPACITIVE KEYBOARD WITH NON-LOCKING REDUCED KEYING AMBIGUITY
First Named Inventor/Applicant Name:	Harald Philipp
Filer:	David W. Black/Nicole Jack
Attorney Docket Number:	3050.022US1

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**810**

Electronic Acknowledgement Receipt

EFS ID:	6095374
Application Number:	11279402
International Application Number:	
Confirmation Number:	8070
Title of Invention:	CAPACITIVE KEYBOARD WITH NON-LOCKING REDUCED KEYING AMBIGUITY
First Named Inventor/Applicant Name:	Harald Philipp
Customer Number:	76287
Filer:	David W. Black/Nicole Jack
Filer Authorized By:	David W. Black
Attorney Docket Number:	3050.022US1
Receipt Date:	17-SEP-2009
Filing Date:	12-APR-2006
Time Stamp:	17:33:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$810
RAM confirmation Number	3757
Deposit Account	190743
Authorized User	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		3050022US1RCE.pdf	109727 b91609bf944912cd7703967111df72553da2c418	yes	4

Multipart Description/PDF files in .zip description

Document Description	Start	End
Request for Continued Examination (RCE)	1	1
Transmittal Letter	2	3
Information Disclosure Statement (IDS) Filed (SB/08)	4	4

Warnings:

Information:

2	Foreign Reference	001_ep00609021a2.pdf	589407 e7ee64b957d259252d615f825fe0213f0e005391	no	13

Warnings:

Information:

3	Foreign Reference	002_ep00689122a1.pdf	4095922 895511878a8e693c1d684c2432112ef9459bc55b	no	123

Warnings:

Information:

4	NPL Documents	003_3050083us1amend.pdf	212933 e10e51adae9639f02f0a7f0656e3eed77a2d8126	no	6

Warnings:

Information:

5	NPL Documents	004_3050083us1noa.pdf	429476 94fdbaa29ff69999539f85871b96a2006f28eab8	no	9

Warnings:

Information:

6	NPL Documents	005_3050083us2noa.pdf	403280 9e09faf04e582fe4caaff2883b89b8b13c6a5f76	no	8

Warnings:

Information:					
7	Fee Worksheet (PTO-875)	fee-info.pdf	31015 6858e217e27f4ae95d7147c3810e199186563477	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	5871760	

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NOTICE OF ALLOWANCE AND FEE(S) DUE

76287 7590 10/23/2009

SCHWEGMAN, LUNDBERG & WOESSNER / ATMEL
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
WONG, ALBERT KANG	
ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 10/23/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/279,402	04/12/2006	Harald Philipp	3050.022US1	8070

TITLE OF INVENTION: CAPACITIVE KEYBOARD WITH NON-LOCKING REDUCED KEYING AMBIGUITY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	01/25/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

76287 7590 10/23/2009

SCHWEGMAN, LUNDBERG & WOESSNER / ATMEL
P.O. BOX 2938
MINNEAPOLIS, MN 55402

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/279,402	04/12/2006	Harald Philipp	3050.022US1	8070

TITLE OF INVENTION: CAPACITIVE KEYBOARD WITH NON-LOCKING REDUCED KEYING AMBIGUITY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	01/25/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
WONG, ALBERT KANG	2612	341-033000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/279,402	04/12/2006	Harald Philipp	3050.022US1	8070

76287 7590 10/23/2009

SCHWEGMAN, LUNDBERG & WOESSNER / ATMEL
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
WONG, ALBERT KANG	
ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 10/23/2009

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 736 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 736 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)
	11/279,402	PHILIPP, HARALD
	Examiner	Art Unit
	ALBERT K. WONG	2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE filed 9/17/09*.

2. ☒ The allowed claim(s) is/are *1-24*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

1. This Office action is in response to the Request for Continuing Examination (RCE) filed September 17, 2009. Claims 1-24 are pending. The references cited on the Information Disclosure Statement filed September 17, 2009 have been considered. It has been determined that the cited references do not affect the reasons for allowability as stated in the prior Office action. The Examiner thanks applicant for fulfilling his duty of candor and for the use of proper prosecution practices before the Office.

2. Claims 1-24 are allowed.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALBERT K. WONG whose telephone number is (571)272-3057. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian A. Zimmerman can be reached on 571-272-3059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Albert K Wong/

Primary Examiner, Art Unit 2612

October 7, 2009

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11279402	PHILIPP, HARALD
	Examiner	**Art Unit**
	ALBERT K WONG	2612

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
341	33	H 0 3 M 11 / 00 (2006.01.01)	

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
341	26				
345	173				
400	479.1				
200	600				

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	24	
/ALBERT K WONG/ Primary Examiner.Art Unit 2612	10/7/09	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1A

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11279402	PHILIPP, HARALD
	Examiner	Art Unit
	ALBERT K WONG	2612

SEARCHED

Class	Subclass	Date	Examiner
341	20, 22, 26, 33	6/7/09	
400	479.1		
345	173		
200	600		
178	18.01		
702	65, 64		
search update		10/7/09	AKW

SEARCH NOTES

Search Notes	Date	Examiner
EAST		
search terms:capacitive, keyboard, scan, predict, bias, keys, selection, previous	6/7/09	AKW
search update	10/7/09	AKW

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
all searched classes		6/7/09	AKW
search update		10/7/09	AKW

PTO/SB/08A(04-07)
Modified form approved for use through 09/30/2007. OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	11/279,402
Filing Date	April 12, 2006
First Named Inventor	Harald Philipp
Group Art Unit	2612
Examiner Name	Daniel Wu

Sheet 1 of 1

Attorney Docket No: 3050.022US1

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
	US-4,305,135	12/08/1981	Dahl, Jerome P., et al.	07/30/1979
	US-4,420,744	12/13/1983	Jesson, Joseph E.	02/12/1981
	US-4,616,213	10/07/1986	Danish, Sherif	01/14/1983
	US-4,617,554	10/14/1986	Krause, Charles A., et al.	08/26/1983
	US-5,469,159	11/21/1995	Fukazawa, Makoto	06/09/1992
	US-5,508,700	04/16/1996	Taylor, Thomas M., et al.	03/17/1994
	US-5,583,498	12/10/1996	Sukigara, Akihiko	11/08/1994
	US-5,585,733	12/17/1996	Paglione, Robert W.	06/07/1995
	US-5,730,165	03/24/1998	Philipp, Harald	12/26/1995
	US-5,844,506	12/01/1998	Binstead, Ronald Peter	10/03/1996
	US-6,137,427	10/24/2000	Binstead, Ronald P	10/27/1998
	US-6,452,514	09/17/2002	Philipp, Harald	01/26/2000
	US-6,466,036	10/15/2002	Philipp, Harald	09/07/1999
	US-6,943,705	09/13/2005	Bolender, Robert James, et al.	09/19/2002
	US-7,091,886	08/15/2006	DePue, Todd L., et al.	06/09/2004
	US-7,158,054	01/02/2007	Pihlaja, Pekka	09/21/2004

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	T [1]
	EP-0609021A2	08/03/1994	Boie, Robert Albert, et al.	
	EP-0689122A1	12/27/1995	Katsumi, Murai, et al.	

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T [1]
	"Application Serial No. 10/617,602, Amendment filed January 27, 2005", 6 pages	
	"Application Serial No. 10/617,602, Notice of Allowance mailed 4/27/05", 9 pages	
	"Application Serial No. 11/160,885, Notice of Allowance mailed June 8, 2007", 8 pages	

EXAMINER /Albert Wong/ **DATE CONSIDERED** 10/07/2009

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.W./

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL		
Subsection (b) of 35 U.S.C. § 132, effective on May 29, 2000, provides for continued examination of an utility or plant application filed on or after June 8, 1995. See The American Inventors Protection Act of 1999 (AIPA).	*Application Number*	11/279,402
	Filing Date	April 12, 2006
	First Named Inventor	Harald Philipp
	Confirmation Number	8070
	Group Art Unit	2612
	Examiner Name	Albert Wong
	Attorney Docket Number	3050.022US1
	Customer No.	76287

This is a Request for Continued Examination (RCE) under 37 C.F.R § 1.114 of the above-identified application entitled
Capacitive Keyboard with Non-Locking Reduced Keying Ambiguity

1. Submission required under 37 C.F.R. § 1.114:

   X Amendment (10 pages) is enclosed.

2. Fees

   X Authorization to charge deposit account 19-0743 in the amount of $810.00 to pay the RCE filing fee required under 37 C.F.R. § 1.17(e).

   X **The Commissioner is hereby authorized to charge any additional fees or credit overpayment to Deposit Account No. 19-0743.**

SCHWEGMAN, LUNDBERG & WOESSNER, P.A. By: _____
Robert E. Mates
Reg. No. 35,271

CERTIFICATE UNDER 37 C.F.R 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 19 day of January, 2010.

Nicole Jack
Name

_____
Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Harald Philipp	Examiner: Albert Wong	
Serial No.:	11/279,402	Group Art Unit: 2612	
Filed:	April 12, 2006	Docket No.: 3050.022US1	
Customer No.: 76287		Confirmation No.: 8070	
Title:	Capacitive Keyboard with Non-Locking Reduced Keying Ambiguity		

AMENDMENT

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Prior to taking up this application for examination, please enter the following amendments:

REMARKS

Claims 1-24 are allowed. New claims 25-45 have been added. As a result, claims 1-45 are now pending in the present application.

Support for the new claims is believed found in the current allowed claims, and further at least in paragraphs [0029 – 0042] and FIGs. 1-5. The new claims are believed allowable at least in view of the statement of reasons for allowance in the Notice of Allowance which indicate that a "…controller biases the determination based on the previously selected or determined key."

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's representative at (612) 373-6972 to facilitate prosecution of this application.

If necessary, please charge any additional fees or deficiencies, or credit any overpayments to Deposit Account No. 19-0743.

Respectfully Submitted,

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402--0938
(612) 373-6973

Date 19 January 2010 By /Robert E. Mates/
Robert E. Mates
Reg. No. 35,271

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 19 day of January, 2010.

Nicole Jack /Nicole Jack/
Name Signature

Electronic Patent Application Fee Transmittal

Application Number:	11279402
Filing Date:	12-Apr-2006
Title of Invention:	CAPACITIVE KEYBOARD WITH NON-LOCKING REDUCED KEYING AMBIGUITY
First Named Inventor/Applicant Name:	Harald Philipp
Filer:	David W. Black/Nicole Jack
Attorney Docket Number:	3050.022US1

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**810**

Electronic Acknowledgement Receipt

EFS ID:	6840396
Application Number:	11279402
International Application Number:	
Confirmation Number:	8070
Title of Invention:	CAPACITIVE KEYBOARD WITH NON-LOCKING REDUCED KEYING AMBIGUITY
First Named Inventor/Applicant Name:	Harald Philipp
Customer Number:	76287
Filer:	David W. Black/Nicole Jack
Filer Authorized By:	David W. Black
Attorney Docket Number:	3050.022US1
Receipt Date:	19-JAN-2010
Filing Date:	12-APR-2006
Time Stamp:	18:59:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$810
RAM confirmation Number	6448
Deposit Account	190743
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		3050022US1RCE.pdf	72454 ea8063cbbdc5847431b9b4537f4a0b56d39262bb	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Request for Continued Examination (RCE)	1	1
	Amendment Submitted/Entered with Filing of CPA/RCE	2	2
	Claims	3	9
	Applicant Arguments/Remarks Made in an Amendment	10	11

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	31015 7671beacfd50c31c77f678d25ca53181ccf9983e	no	2

Warnings:

Information:

Total Files Size (in bytes):	103469

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 01/25/2010

MMCGEE1	SALE	#00000005	Mailroom Dt:	01/19/2010		190743	11279402
		01	FC : 2201	330.00	DA		
		02	FC : 2202	572.00	DA		

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/279,402	04/12/2006	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
☒ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	250		N/A	
☒ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	100		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	24 minus 20 =	* 4	X $25 =	100	OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	* 0	X $100 =	0		X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	525		TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 01/19/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 46	Minus	** 24	= 22	X $26 =	572	OR	X $ =	
Independent (37 CFR 1.16(h))	* 6	Minus	***3	= 3	X $110 =	330	OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE	902	OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/MARQUETTA MCGEE/

IN THE CLAIMS

Please amend the claims as follows:

1. (Original) An apparatus for supplying a unique key output from an operating key board comprising a plurality of keys when a user is proximate two or more keys thereof, the apparatus comprising:

a respective sensor uniquely associated with each of the two or more keys, each of the sensors connected to supply a respective output signal representative of the user's coupling thereto to a controller;

the controller operable to iteratively compare all of the two or more output signals supplied thereto to respective threshold values and to each other, to initially select as the key for supplying the unique key output that one of the two or more keys having a maximum value of all the signal outputs that exceed their respective thresholds, and, on subsequent iterations, to bias the iterated comparison in favor of the previously selected key.

2. (Original) The apparatus of Claim 1 wherein each key comprises a respective capacitive proximity sensor.

3. (Original) The apparatus of Claim 1 wherein one of the keys of the plurality thereof comprises a guard ring disposed around at least one other of the keys in the plurality thereof.

4. (Original) The apparatus of Claim 1 wherein the controller is operable to bias the iterated comparison by increasing respective differences between the value associated with the previously selected key and the respective value associated with each of the other of the two or more keys.

5. (Original) The apparatus of Claim 1 wherein each of the sensors has a counter respectively associated therewith and wherein the controller is operable to bias the iterated comparison by changing a value stored in at least one of the counters.