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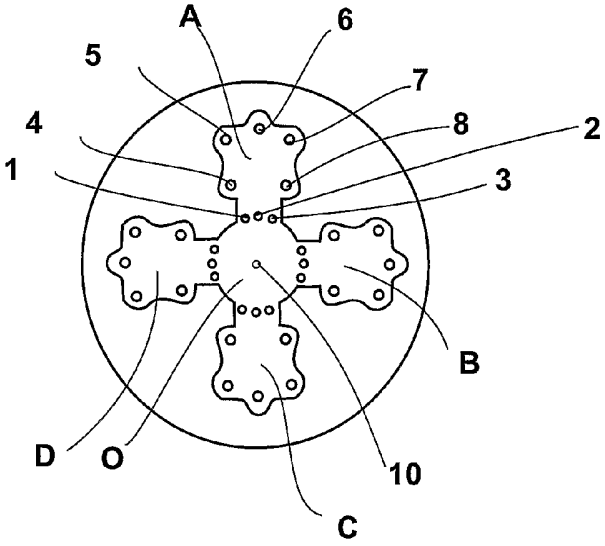
(54) **Title:** DEVICE FOR SELECTION OF SYMBOLS, SUCH AS CHARACTERS, ICONS AND/OR MULTIPLE CHOICES



(57) **Abstract:** The invention relates to a compact electric device for coding and selecting characters, symbols and/or multiple choices, consisting of a matrix carrying a plurality of contact or proximity sensors, an activation member of said sensors and a single selection key. This key is operated by the user for bringing in turn said activation member at least partially in coincidence with at least a first and a second of said sensors, for transmitting a selectively different coded signal for each respective different sensor. The matrix comprises a first group of sensors , having function of selection of respective matrix fields, and a second group of sensors, having function of selection of characters associated to each matrix field. Preferably, said single selection key is integral to the activation member and movable with respect to said matrix' of sensors. Said sensors are distributed on the matrix according to modular zones, comprising a central zone and radial sector zones. The sensors of the first group are located in a passageway between the central zone and the radial zones and the sensors of the second group are located within said radial zones. To each radial zone more than one virtual matrix fields are associated. The activation member stops against the edge containing the sensors, assisting the movement and the choice of the path.

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TITLE

DEVICE FOR SELECTION OF SYMBOLS, SUCH AS CHARACTERS, ICONS AND/OR MULTIPLE CHOICES

Field of the invention

The present invention relates to a device for coding and selecting characters, icons and/or multiple choices, based on the use of a single input element (single key), which can be operated according to different trajectories controlled directly by a user. In the following description with the term "symbol" generically a character, an icon, a command for example of the multiple choice type, are defined.

Background of the invention

The need is felt in many devices, which in use provide an electronic controller, to introduce data through an input element.

Normally, an alphanumeric keyboard is provided; special pivoting keys also exist, which allow a limited number of multiple choices, typically four.

It is also much known the need of miniaturization of some electronic devices, such as mobile phones and "palm top" computers, as well as keyboards for dashboards, for example on a steering wheel.

Such miniaturization is often limited by the need to provide a keyboard whose size allows to operate easily the relative keys, owing to the typical size of the fingers of the hand. In these cases, keyboards are provided with a limited number of keys, giving to each key more functions, determined according to the pushing succession of the key same. Alternatively, sometimes, if possible, special actuating sticks are provided, which allow the discrimination of the characters even with a reduced size on the keyboard.

This last possibility, however, can not be

generalized, because is required the use of ambedue the mani, a for supporting the device and the other for operating the asticciola, and then because is not advantageously which can be fixed in extreme conditions to use in outer environment.

in the followed of the present description reference is caused to that the invention trova its applied on for example as single key of driving cellular telephones, volanti for auto, etc.; this reference must however considering purely exemplifying and for nulla limitative, since a skilled person is perfectly capable of immaginare uses different all the times that it is necessary, or simply suitable, to provide a means actuating to "single key of drive" for generating signals of different tipo, both for a user final that for an use in the field of industriale.

Va in any case ricorsince a keyboard alphanumerical for computer has at least about 90 keys which, differently combinati, is possible digitare at least about 200 characters maximum number or other symbols. Instead, in case of a mobile phonee, where they are normally provided in average 15 tasti, for transmitting a number about corresponding high of symbols maximum number, to each keys is given a task "multiple". In other words, each key provides an unit for signals different depending on whether they is pressed a solonce or more times in turn approached. These tastiere are now very known, and their use is thus common that the possessori of mobile phone in particular, the more young do not have difficulty to digitare quickly of the messages (SMS) also enough long.

Since the technology va now always more towards the miniaturization, is put however the problem of as further reducing the size of a system of drive, type keyboard, capable of generating a plurality of signals different

easily and intuitivo.

Many types exist of devices adapted to risolvere, even if partially, the problems above described. For example, WO2004072837 describes a input device with a monokey that can be operated in different directions within the radius of action of a finger for allowing the input of many controls. a plurality provides sensor means, arranged according to order to sentire the approaching or the contact of the key of input, and for making a relative signal that is received by a control unit that causes qual sensor has been interessato by the key and associa a corresponding drive, which can be for example a letter of the alphabeto, a numero, excetera. In this way can be reducing remarkably the size of the device of input, allowing a miniaturization of the apparatus electronic that the utiliza. This device, however, provides a plurality of grooves arranged for example in the number of 12 each 360°. In each groove can be arranged more sensors. Then, the user, sceglie one of the twelve directions and pushes the key in that direction chosen, supering all the sensors up to reaching that predetermined corresponding to the character or to the drive chosen. This system can put errors of input, since the user must stillng to the sensor corresponding to the drive chosen, and not superarlo up to reaching the successive, otherwise the drive changa.

Summary of the invention

The present invention is oriented to solve this problem in a reliable and industrially cost effective way. This result is achieved through the features defined in claims 1 and 14.

The basic idea of the present invention is that of selecting symbols, such as characters, icons and/or multiple choices, providing a matrix having a plurality of sensors split into a first group of sensors, having

function of choice, and at least a second group of sensors, associated each to a limited number of such symbols. Such sensors can be activated bringing an activation member at least partially in coincidence with one of said sensors, determining a corresponding selection signal. This way, bringing the activation member in turn on a first sensor belonging to the first group and then a second sensor belonging to the second group, it is possible to identify each sensor of the first and second group as they are selected, choosing univocally one among the limited number of symbols associated to the sensor of the second group, in a way responsive to which sensor of the first group had been selected immediately before by said activation member.

This gives a function of "gate" to the sensors of the first group, allowing a unique choice of a symbol associated to a sensor of the second group. Furthermore, the possible combinations can be multiplied, covering with a single input device a high number of different symbols. The selection of a symbol is obtained, this way, with a single movement of a finger following a determined path in a minimum radius of action causing the activation member or slider to reach different sensors with a single movement, which is sudden, quick, continuous and harmonic without detaching the finger from the slider. The activation member stops then against the edge containing the sensors, assisting the movement and the choice of a desired path.

This way a device is obtained having a very intuitive use capable, with the practice, to be operated even without looking at the motion that it follows by the action of a finger.

particular and advantageous aspects of the invention are object of the dependent claims.

Brief description of the drawings

Further characteristic and advantages of the invention, as well as its operation and the logic actuation, will be better comprised through the detailed description of some exemplary embodiments, given as an example, shown in the attached drawings, wherein:

- Figure 1 is a top plan view of a first exemplary embodiment of a device according to the invention, in particular, with a matrix configuration having four actuating zones, which can be used in combination with single-key actuating means;
- Figure 2 shows an exemplary embodiment of the matrix configured device of figure 1, arranged as a plane, having a thickness;
- Figure 3 is a diagrammatical three-dimensional view, partially cross sectioned, of a second exemplary embodiment of the device according to the invention, with spherical configuration;
- Figure 4 is an exploded view of the same device of figure 3, where the component parts are shown;
- Figure 5 is a three-dimensional view, partially exploded, of an exemplary embodiment similar to figure 3, but with a outer and operating guiding system by means of a lever or "joystick";
- Figures 6A and 6B show respectively a situation of three sensors placed adjacent to one another and a diagram that shows the amplitude of the detectable signals, which is different responsive to the distance of the selection key from each sensor;
- Figure 7 represents a generic flow-sheet of a control software in conditions of operation;
- Figure 8 shows an exploded perspective view of a possible structure of the first exemplary embodiment of

the device according to the invention;

- Figures from 9 to 11 show a cross sectional view of three possible variations of the first exemplary embodiment of the device according to the invention;
- Figures 12 and 13 show respectively a top plan view and a cross sectional view of a possible structure of the second exemplary embodiment of the device according to the invention;
- Figure 14 shows an exemplary structure of the solution of figure 13 with a resilient mambrane, instead of a spring, for controlling the position of the selection key;
- Figures 15 and 16 show two diagrams, relative respectively to the exemplary embodiments of figure 1 and of figure 8, of the possible selection path of the characters, a combination of sensors of the first group with those of the second group, each path corresponding a different character;
- Figures 17 and 18 show two exemplary embodiments of the device, with a high number of combinations of possible paths and then of obtainable symbols;
- Figure 19 shows a device according to the invention mounted on the steering wheel of a vehicle;
- Figure 20 shows a remote control of prior art and figure 21 shows a remote control of reduced size obtainable using the device according to the invention, even if with the same number of combinations of the keys of the device of figure 20;
- Figure 22 shows a portable computer of prior art and figure 23 shows a portable computer of reduced size obtainable using the device according to the invention, even if with the same number of combinations of the keys of the portable computer of figure 22;
- Figure 24 shows a mobile phone of prior art and figures 25 and 26 show a mobile phone respectively with display

larger or smaller, obtainable using the device according to the invention, even if with the same number of combinations of the keys of the mobile phone of figure 24.

Description of a preferred exemplary embodiment

As shown in figures 1 or 2, a matrix configuration according to the invention can have, for example, a cloverleaf shape, with a central rest zone O and four working zones A, B, C, D, arranged radially, in a star rays arrangement, with respect to said central zone O. At the centre of this zone O an activation member is located, indicated as 10. The working zones A, B, C, D, are alike and for each zone (only the sensors of the zone A are numbered advantageously) three sensors 1, 2 and 3 are arranged in the passageway towards each radial zone, and belong to a first group of sensors. In each radial zone other five sensors are provided, distributed at the boundary, as better described hereinafter, and defined by the reference numbers 4, 5, 6, 7 and 8, which belong to a second group of sensors.

Here and hereinafter a generic "activation member" is referred to, as well as "sensore", being it clear that with the first term the device indicated as 10 is defined, which is a movable element associated to a key or push button, and with the second term an element indicated as 1 up to 8 is defined, which are fixed elements, adapted to measure the presence or the contact of the activation member. These terms "activation member" and respectively "sensor" must not therefore being interpreted narrowly, or in a limitative may, but only as an exemplary way to define two opposite elements that, when they are in coincidence or in close proximity with each other, they are capable to emit a coded signal, specific for each of said sensors and/or of the matrix field that is respectively associated to them.

The activation member 10, as said, is associated to a selection key, here not shown but visible for example in figure 8 and indicated with 22, which is located at the central zone or and is manoeuvrable by the operator. This element, here and hereinafter called simply as "selection key", may have a desired configuration adapted to move the activation member 10 to it associated with respect to the fixed sensors from 1 to 8; such a configuration can be a push button, an actuating stick of the type used for controlling a "palm top", or a pin or button or lever of manoeuvre hinged at the centre, preferably associated to resilient means that, when the lever is operated for displacing the activation member 10 towards the radial zones, and then released, tend to bring it back always towards the centre.

When the selection key is operated towards one of the radial zones, firstly it passes at one of the sensors 1, 2 and 3 of the respective zone and, thus activating one of them, which for example can be a contact or of proximity sensor, a microswitch, a Hall effect sensor, a magnetoresistive sensor or a active matrix sensor. Depending on whether this activation affects sensor 1, 2 or 3, a first, or a second, or a third matrix field associated to said zone is correspondingly selected; these matrix fields can be considered "virtual" because each field is determined by the same sensors from 4 to 8 of a specific zone, but considered in a different way by the control unit, responsive to which sensor from 1 to 3 had been pre-selected.

Actually, when the selection key continues its movement up to one of sensors 4, 5, 6, 7, 8, it activates the selection of one of the characters/symbols associated to the selected sensor and respectively to the first, to the second i.e. to the third matrix field.

Possible combinations of paths, respectively for the configurations of figure 1 and of figure 8, are shown in figures 15 and 16.

For a better understanding of this arrangement of the present invention, the following example is, with reference to figure 1 and to figure 15:

In this example three matrix fields are associated to zone A, indicated as fields 1, 2 and respectively 3; field 1 is associated to sensor 1, field 2 is associated to the sensor 2 and field 3 is associated to sensor 3 of the first group of sensors;

to matrix field 1 five characters are associated, for example corresponding to the letters "a", "b", "c", "d", "e", and these characters are associated respectively to sensors 4, 5, 6, 7, 8 of the second group of sensors;

furthermore, to field 2 are also associated five characters, different from the characters of field 1, for example corresponding to the letters "f", "g", "h", "i", "j", in turn associated always respectively to sensors 4, 5, 6, 7, 8;

finally to field 3 are associated further five characters, for example corresponding to letters "k", "l", "m", "n", "o", in turn associated always respectively to sensors 4, 5, 6, 7, 8.

When the selection key moves for example towards zone A, it is intentionally brought to slide in the vicinity of one of sensors 1, 2 or 3 of the first group, as desired, for example sensor 2, thus activating matrix field 2. Moving on within the zone A, the selection key is then brought at one of the five sensors of the second group, which are arranged according to this zone A; for example the sensor chosen is sensor 5, activating as defined above the character corresponding to letter "g";

this character corresponds in fact to sensor 5 of second matrix field 2.

In addition, citing two additional exemplary arrangements, if the selection key is maitained for a short time at the selected sensor, or if it is pressed in this position, at the letter "g", low case, then the letter "G" upper case is selected. Other equivalent solutions are obvious to the skilled person.

It is clear that to each zone A, B, C or D three matrix fields correspond and to each of these fields five characters correspond, therefore fifteen characters for zone, i.e. sixty characters or different symbols in the combination of the four zones. On the other hand, it is apparent that this is a simple example and that it is very easy for a skilled person to design a matrix that, instead of having four cloverleaf zones and five sensors for each zone, it has a different number of zone and a different number of sensors for each zone.

An example of this arrangement is given in figures 16, 17 and 18. In the first case, figure 16, for each zone A-D two sensors of the first group are provided, indicated as 1 and 2 for zone A, and three sensors of the second group, indicated as 3, 4, 5 for zone A. This device, by twenty sensors, allows to select up to 24 symbols or characters for each mode of operation of the selection key 10.

In the latter case, figure 17, the four zones A-D are four respective quadrants, having common sides. This way, for each zone A-D three sensors of the first group are provided, indicated as 1-3 for zone A, and nineteen sensors of the second group, indicated as 4-8 for zone A. This device, by means of 68 sensors, allows to select up to 228 symbols or characters for each mode of operation of the selection key 10. This solution with adjacent

quadrants is very effective since it is possible to put in common sensors at the border between two adjacent zones, i.e. the common sides, as in the case of sensors 4 and 8. In fact, even if being shared by two adjacent zones, the sensors 4 and 8 are discriminated according to the path followed for the respective zone, recognizing the respective sensor of the first group, 1 or 2 in case of zone A.

In a way similar to figure 17, in the third case of figure 18, there is a division into fields with common sides. In particular, there are seventytwo sensors split into eight zone A-H, for each zone two sensors of the first group are provided, indicated as 1-2 for zone A, and nine sensors of the second group, indicated as 4, 5 and 8 for zone A. This device, allows selecting up to 176 symbols or characters for each mode of operation of the selection key.

The sensors 4-8 for all the zones and for various exemplary embodiments shown up to here, can be made within the edges of the zone or at the edges same. The same occurs for the gate sensors indicated as 1 and 3, excluded sensor 2 that is located at the centre.

To this purpose the transmission of a coded signal from one of the sensors from 1 to 8 takes place not only when the activation member 10 moves in perfect coincidence with one of them; it is enough that the activation member 10 moves close to one of them to select it, at a distance nearer than for the others. Actually, the motion of the activation member 10 near a desired sensor 1 to 8 provides an electric signal, for example by Hall effect, which is proportional to the overlap of the active surfaces of such sensors. It is not necessary, as already mentioned, that the passage on sensor occurs with high precision, but only the strongest signal, i.e.

proximity to a sensor, higher with respect to the other sensors near it. This aspect is diagrammatically shown in figures 6A and 6B with reference, for example, to the three sensors 1, 2, 3 that are located, with reference for example to figures 1, 2 or 15, on the passageway of activation member 10 when it is moved from the central position towards one of zones A, B, C or D, for example zone A.

Always with reference to figure 6A, when activation member 10 moves approximately towards sensor 2, on it a signal "S2" is generated that, as shown in figure 6B, has an amplitude higher than signals "S1" and "S3" obtained for sensors 1 and respectively 3. The central electronic control unit is then capable to discriminate among these different signal amplitudes and therefore to consider sensor 2 activated, i.e. that for which the signal has higher amplitude. The same occurs, for example, when a user moves activation member 10 in zone A, towards one of the sensors 4, 5, 6, 7, 8 of the second group (for example always with reference to figures 1, 2 or 15), arranged approximately along the border of zone A.

The action of the finger of the hand on the selection key, for reaching the different sensors, in particular, sensors 4, 5, 6, 7, 8 located on the contour of each radial zones A, B, C, etc., is carried out in a way assisted by stopping the selection key against the edge of each zone; concerning the sensors of the first group 1, 2, 3 located on the passageway between the central zone or and the radial zones, the movement through them is more intuitive, for example sliding on the edge at the right or the left of the figure, concerning respectively sensors 1 and 3, or running in the centre on sensor 2, when a user is sufficiently trained. Even in this case, however, a reference for guiding the activation

member for selecting the sensors of the first group can be provided, such as grooves or ridges.

To assist in any case to reach precisely all these sensors the following additional arrangements are preferably required:

firstly, the drive logic can be made preferably in order to have instantly on the display the character or symbol corresponding to the sensor that each time is obtained by the selection key; thus, the user can test immediately if this character or symbol is correct,

then provided on a display a diagram can be for easily reading the positions that can be reached by the selection key and the corresponding characters obtainable;

finally, as already said, if the sensors are proximity sensors, the selection key passing between two sensors is in any case detected, and the choice of the character is made by a control routine that chooses the stronger signal on the nearest sensor; control routine can discriminate the signal corresponding to the nearest sensor according to the features of the signal detected, except from errors or failure of the system, but also in these cases the user has always the possibility to cancel the possible wrong character and to select a correct signal.

The choice of the characters is immediate, for having a quick selection. In case of error, once the selected character has been shown on the display, the user can cancel it maintaining the selection key on the same sensor for a longer time, at the end of which the control routine provides to its cancellation and the user can then select a correct

character.

Alternatively, the logic of drive cannot select instantly a character, but it has to wait a confirmation from the user; such a confirmation can be given, for example, with a short pressure on the selection key or, in an easier way, on a short stop of the selection key at the chosen sensor.

The control routine proceeds for example according to the flow-sheet of figure 7, but it is clear that this diagram is purely exemplary and a skilled person can provide different equivalent softwares. In figure 7 as "preselection" the activation has been indicated of a sensor of the first group, and with "selection" the activation of a sensor of the second group has been indicated.

In this control routine a deleting mode can be provided, for example, as already said, with permanence of the selection key on a respective sensor for a longer time letting the operator to choose then another symbol or character; it will move then to another position of the same zone, if the symbol is along the same path, or it will follow a different path in the same zone, or it will enter different zones according to the above described procedure. Actually, the control routine is such that when exiting from a zone the coding operations are not affected, but only cancelling the previous pre-selections.

It is also possible that, alternatively, stopping on a whichever sensor of the first group, a single and progressive cancellation is activated. Alternatively, the function of cancellation can be achieved by following a succession of a determined sensor of the first group and of one of the second group.

It is in any case clear the essential difference of the arrangement according to the invention with respect

to the prior art. In the latter for example in a remote control (figure 20), in the portable computers (figure 22) or in mobile phones (figure 24), the choice of different characters is obtained through on a number more or less high of selection keys. In particular, in case of the mobile phones, on at least ten keys, corresponding to the numbers from 0 to 9, and furthermore, pressing again the keys to obtain characters arranged in groups of thee or four. According to the present invention, instead, operation of a single selection key is required, in single or double configuration according to various applications and structures, i.e. the key associated to the central sensor 10, as shown in figure 21 in remote controls, in figure 23 in portable computers, and in figures 25 and 26 for mobile phones.

In addition to what described above with reference to figure 1, that, in the arrangement as representsta, allows determining the choice of an on sixty characters to arranging, is to the carried of a skilled person to provide the logic of drive in order to ampliare the number of characters from choose. For example, it is possible to consider two different situations of the selection key:

- key subject to a pressure towards the sensor, and
- arresto timeraneo of the selection key, for at least one time predetermined, at the sensor.

These two situations could being used for allowing for example of moves from the digitation of a character minuscolo to the digitation of the same character maiuscolo and respectively for allowing the sending the character selected. In this way is raddoppia the number of characters or symbols that the device according to the invention is capable of digitare.

and ancora, a pressure of the selection key in the

central position, on the activation member 10, it could that can be commutare the logic of drive between different programs, for associate then to the different sensors further achieved of the functions different from the of the easy transmission of characters, as of the remainder abitual in the tastiere of cellular telephones.

For example, in the central position or it could being provided a position sensor ribassato with respect to all the other (not shown in the figures) so that the resilient means provided riportino in centre the activation member and allows the milkr to reach the sensor ribassato push on the same and operating thus a signal that can affect all the keyboard. Cenvironments the program is change type of scrittura, is changano the symbols, is passes through from maiuscolo to minuscolo, etc.

The stiffness of the solution according to the invention is immediately if is pensa to the reduced size that can be obtained.

Figure 2 shows, very diagrammatically, a first way of operation of the present invention, with the matrix structure formed in a plane 11, made up of actually by two plates coupled 11' and 11'', of which the plate upper 11' defines a contour that defines the zone A, B, C and D and the plate lower 11'' porta the sensors associated to each zona. with this structure plane can be using, as selection key, in addition to the slider shown in figures from 8 to 11, also a stilo of drive (del type already known in devices electronic type "palm top"), whose tip is carried out slide in the plane of the sensors, guided in starts from the support on the contour in determinedon of delimitation to the zone of matrix.

In this shape of esecution purely exemplary can be working resting at first the stilo to the centre, on the

activation member 10, to the only object of activating the matrix, and then causing slide the tip of the stilo on the surface bringing the sensors, towards one of the radial zones, causing it to then pass firstly on an of the sensors 1, 2, 3 of the first group of sensors and then porting it to contact with one of the sensors 4, 5, 6, 7 and 8 of the second group.

Alternatively, it is possible to use, as already said, to a rod or lever of manoeuvre hinged to the centre, i.e. to a slider movable in the plane of the sensors 1 to 8, but that cannot escape out of this plane, for example held by a system to spring or by a membrane resilient capable of follow moves itming on said plane, without raise by the same.

Figures 3 and 4, as well as figures 12-14, show instead, always very diagrammatically, a second exemplary embodiment of the present invention, with the matrix structure formed on of a calotta spherical. Parallel to what visto for arranging second figure 2, the calotta spherical comprises a first surface 12, on which are located the sensors from 1 to 8, and by a seconda surface 13, on which are made of the window 14 of delimitation to the areas or, A, B, C and D. within to the recess consisting the two calotte coupled is inserted, as shows in particular, figure 3, a ball of control 15, having an appendice guiding 16; this appendice, which is capable of moving within the window 14 for being from these guided towards the sensors from 1 to 8, causes its end the element active, i.e. The activation member 10, capable of activating the different other sensors, relevant an each zone, as previously shown, located on the surface 12.

More precisely, the appendice guiding 16 can be magnetic, arranged with its own axis coincident with the axis pole of the ball and protruding by the surface

spherical of a measure the same as the thickness of the calotta spherical 13 containing the track of control consisting the window 14. This way, a base surface 10 of said appendice 16, is tangential to to the inner surface of the calotta spherical 12, on which are located the sensors 1 to 8, adapted to being activated according to the logic shown, for calculate of the passage and of the position of the selection key associated to appendice 16.

The term "calotta spherical" Notwithstanding the representation of figures from 3 to 5 both that indeed of a ball has to be instretched in a direction purely exemplifying: is in fact to the carried of a skilled person pensare to the use of an another desired surface to curvedture finita, having a centre or an axis of rotation. In case of the embodiment to calotta 15, or another desired form, can be provided a recess 15', or a determinedon or a surface riged or knurled, to assist to grip by the user.

As is comprises immediately, the disegno of figure 1 can be representstivo, to the inabout, also of the proiection of the spherical portion 12, 13, seen from the pole upper, in a plane tangential to to the ball pole lower. The element active or activation member 10 associated to appendice guiding 16 has then function equivalent to that of the element 10 of figure 1, put in the tip of the stilo used in the exemplary embodiment of figure 2.

The ball 15 is operated causingla for example rotate for frition with the tip of a finger that is rests on its part upper: when the ball is carried out thus rotate, the appendice cylindrical 16 doted of the activation member 10 is moved in turn, sliding firstly on the sensors 1, 2, 3 of the first group and then the sensors 4 to 8 of the second group, all associated to the ball 12; the motion of

the activation member 10 near one of the sensors 1 to 8 provides an electric signal in the way already described with reference to figure 1,. on the ball can be representsto, for example, the disegno of the cloverleaf with the sensors of the first and second group and relative function.

The mode of operation remain the samee in case of the configuration shown in figure 5, where different is only operating made by a lever of manoeuvre 18, integral to the ball 15. In this case, the ball 15 is however contained within two calotte sferic opposite, and the window 14 forming the radial zones of the cloverleaf carry out function guiding the lever 18. is not any more provided an appendice guiding 16, bensì a sensor 16' (per example a magnet) incorporated in the ball 15 in position diametrally opposite to the lever 18.

Appaiono at this point apparent the advantages of the invention with respect to the state of the art existing, particularly versus cost and expecially of possablety of miniaturization of the devices, being the discrimination due to devices to solid state than to apparati mechanical with mode much known by the state of the art, which here is not the case of dewritten.

In the description it has not been fact reference to the techniques of embodiment for assembling the device in its different forme, since belonging to techniques known and not condizionanti the Novelty of the invention.

In the description has been fact reference to variation of magnetic field, but the sensors could being carried out in order to to exploit another desired technique as the variation of capacity, techniques optical, matrix of phototransistor, or the features of conductivity of microtransistor on substrate polymeric - according to the sviluppi of the nanotecnlogie, of the

microelectronic or other much conosciuti and suggested by the skilled person.

Always in the description has been fact reference to a display, which can be in addition to that of a telephone, palmtop etc., also a display auxiliary to assist the selection of the symbols. on in a zone of the display can be owing to the scritture with the symbols that is highlightsno further when are activated by the slider.

The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, applying current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

CLAIMS

1. Device for selection of symbols, such as characters, icons and/or multiple choices, comprising:

a matrix carrying a plurality of sensors split into a first group of sensors having function of choice and at least a second group of sensors associated each to a limited number of said symbols,

an activation member of said sensors, adapted to being carried at least partially in coincidence with one of said sensors thus producing a corresponding selection signal;

a selection key which can be operated manually for bringing in turn said activation member to select a first sensor belonging to said first group and then a second sensor belonging to said second group,

a control unit adapted to identify each sensor of said first and second group selected by said activation member, and, for each selected sensor of the second group, to choose univocally one among the limited number of symbols associated to said sensor of the second group responsive to which sensor of the first group had been selected immediately before by said activation member.

2. Device according to claim 1 wherein said activation member is located at rest in a central position, said sensors of the first group are located in a position around said central position, and said sensors of the second group are located in a position external to the sensors of the first group with respect to said central position, whereby for reaching a sensor of the second group said key must pass on a sensor of

the first group, activating it.

3. Device according to claim 2 wherein said sensors are distributed on said matrix according to modular zones, comprising a central zone and radial sector zones angularly equidistant, the sensors of the first group being located in a passageway between said central zone and each of said radial sector zones, and the sensors of the second group being located within said radial sector zones.

4. Device according to claim 1 wherein said activation member is integral to said selection key and said matrix of sensors is in fixed position.

5. Device according to claim 1 wherein said activation member is integral to said matrix of sensors and said selection key is in fixed position.

6. Device according to claim 1 wherein said matrix of sensors is formed on a surface selected from the group comprised of:

a plane surface,

a curved surface.

7. Device according to claim 1 wherein means are provided for guiding, at least partially, said selection key for determining the relative movement of said activation member with respect to said sensors.

8. Device according to claims 3 and 7 wherein said means for guiding said selection key for determining said relative movement consist of edges in relief of said radial sector zones.

9. Device according to claim 8 wherein said sensors of

said second group are on said edges in relief.

10. Device according to claim 9 wherein said sensors of said second group are arranged according to recesses defined by said edges in relief or other modular shapes that assist their selection.

11. Device according to claim 1 wherein said activation member is a magnet and said sensors are proximity sensors.

12. Device according to claim 1 comprising three overlapped elements with a plane, spherical, curved, shape, etc., of which a first element provides said matrix of sensors, a second element provides said selection key and said activation member and slides with respect to said first element, and a third element comprises guiding paths for said selection key and is integral to said first element.

13. A method for selection of symbols, such as characters, icons and/or multiple choices, comprising the steps of:

prearranging a matrix carrying a plurality of sensors split into a first group of sensors having function of choice and at least a second group of sensors associated each to a limited number of said symbols,

activating said sensors, bringing an activation member at least partially in coincidence with one of said sensors thus producing a corresponding selection signal, wherein said activation member is brought in turn on a first sensor belonging to said first group and then a second sensor belonging to said second group,

identifying each sensor of said first and second group selected by said activation member, and, for each selected sensor of the second group, choosing univocally one among the limited number of symbols associated to said sensor of the second group responsive to which sensor of the first group had been selected immediately before by said activation member.

14. Method for selection of symbols according to claim 13, characterised in that it is carried out with a device according to claims from 2 to 12.

Fig. 1

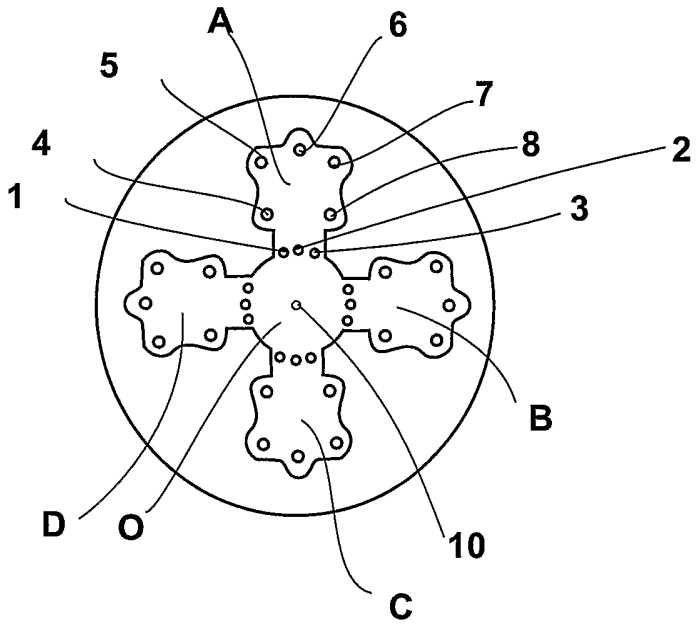
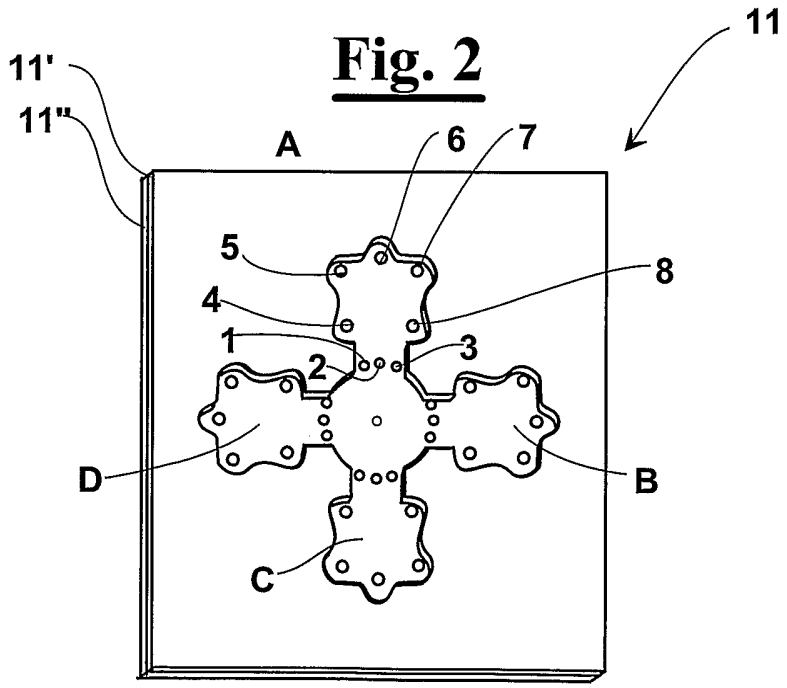


Fig. 2



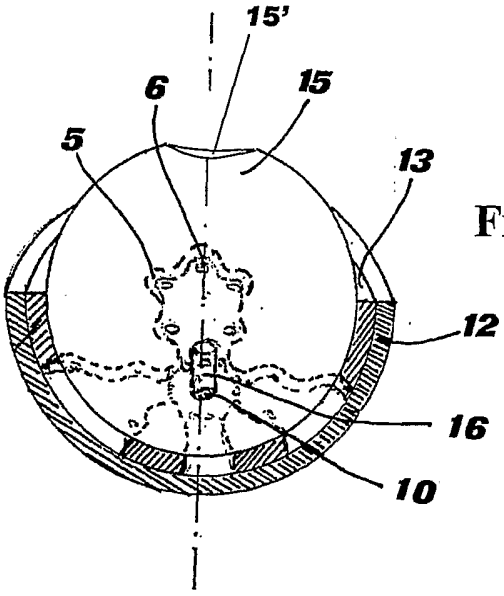
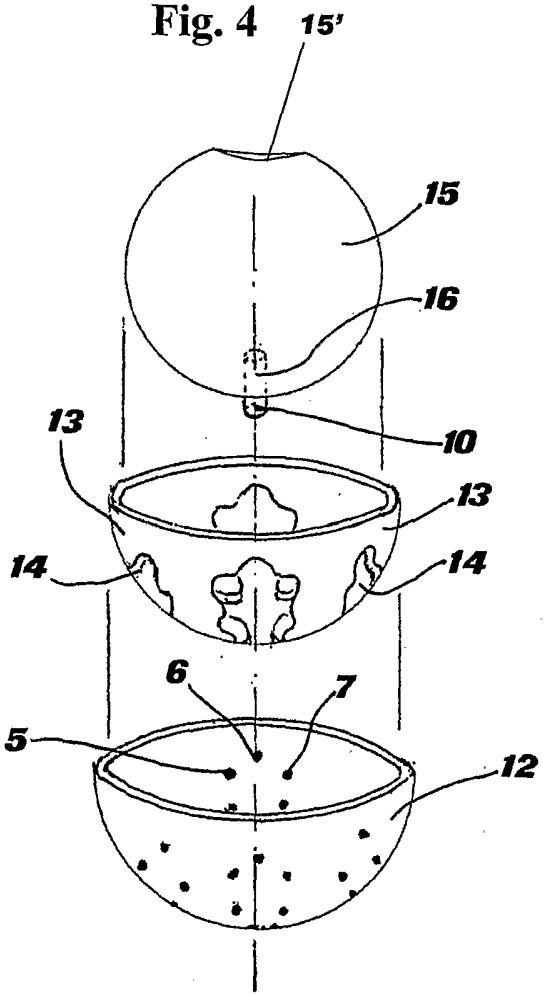


Fig. 3

Fig. 4



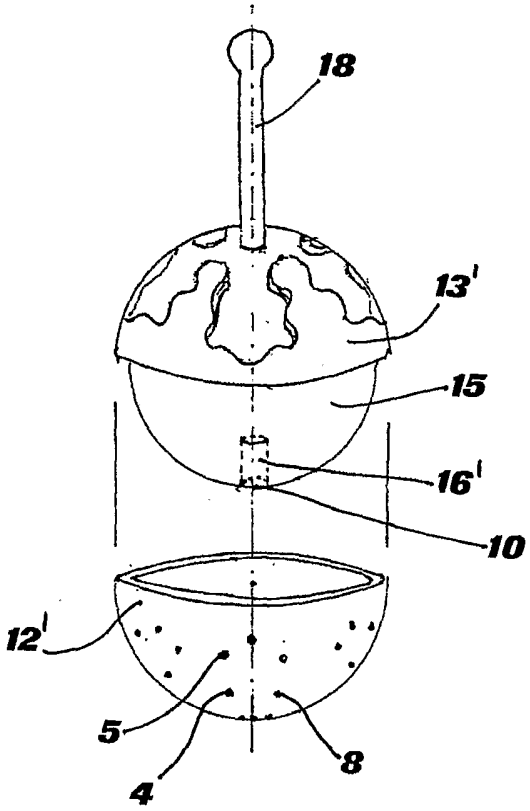


Fig. 5

Fig. 7

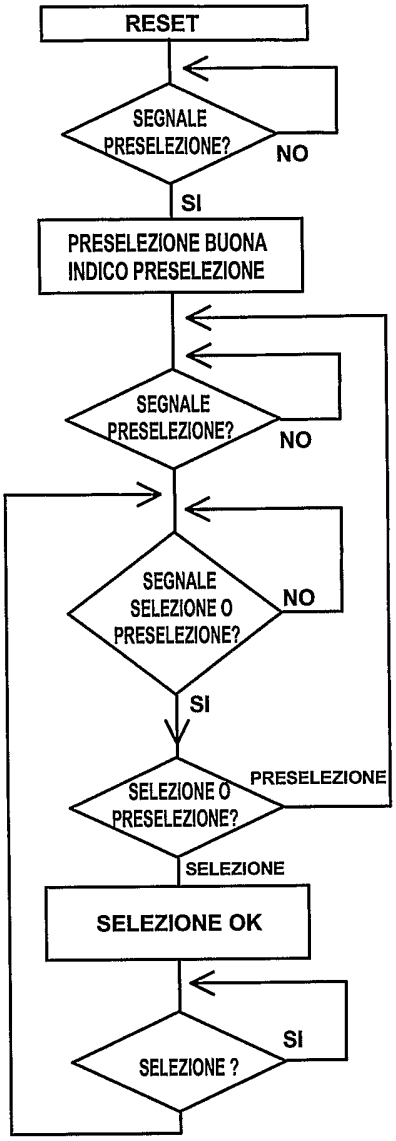


Fig. 6A

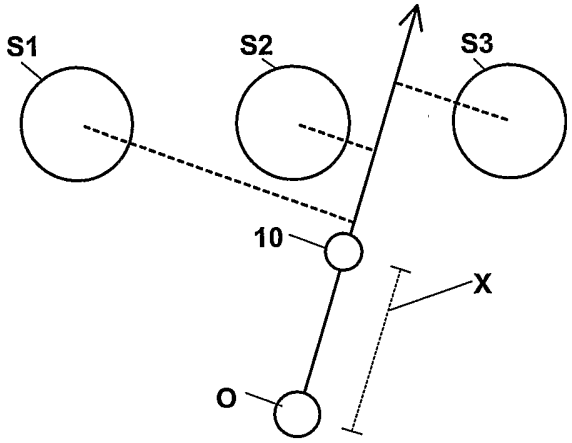


Fig. 6B

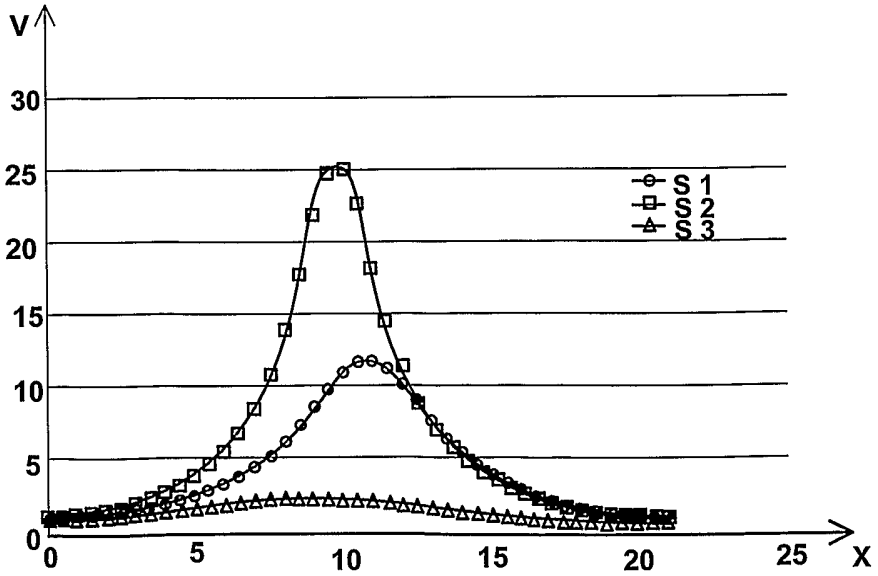


Fig. 8

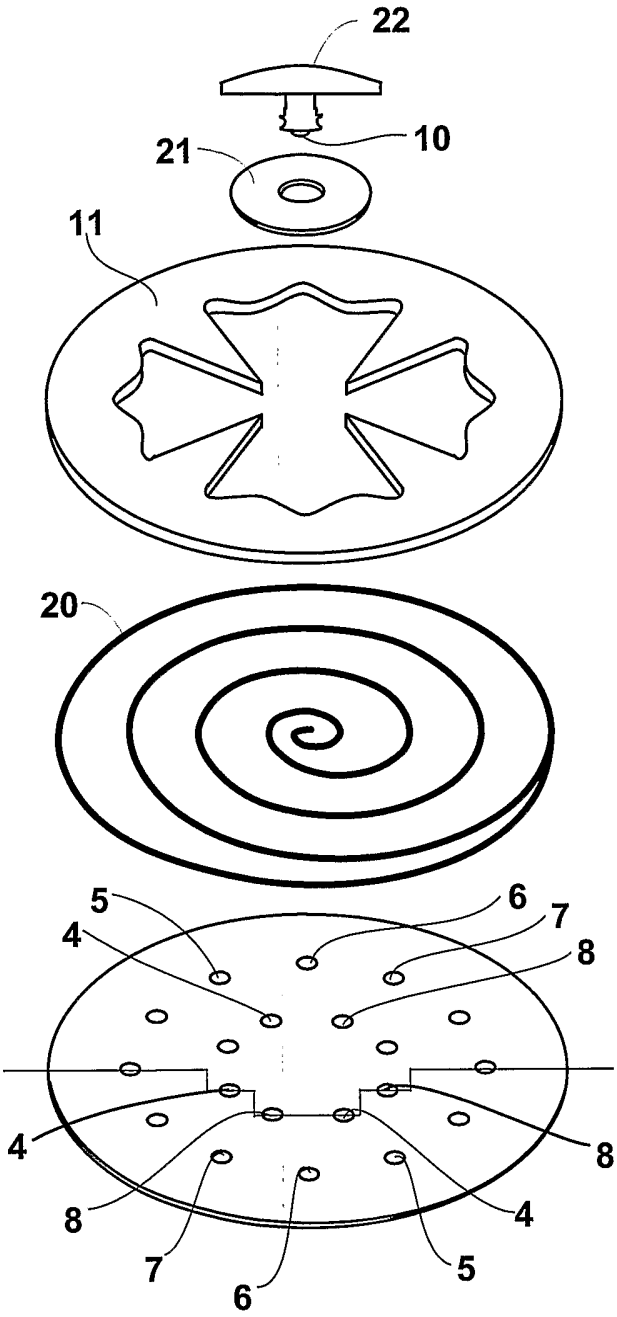


Fig.9

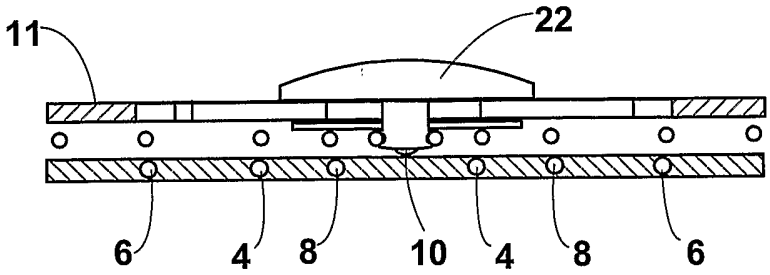


Fig. 10

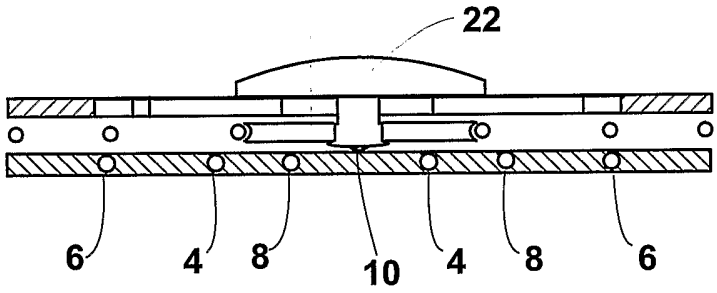


Fig. 11

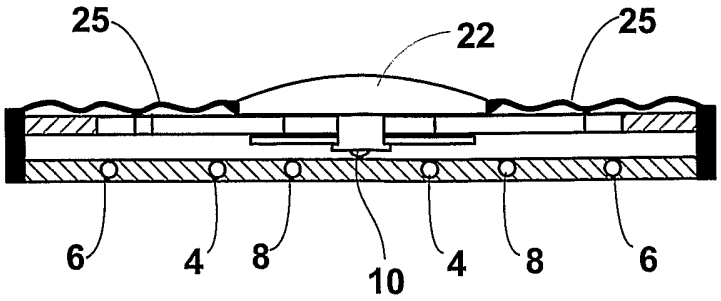


Fig. 12

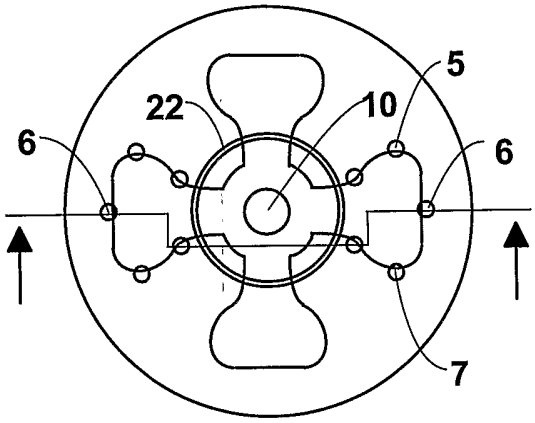


Fig. 13

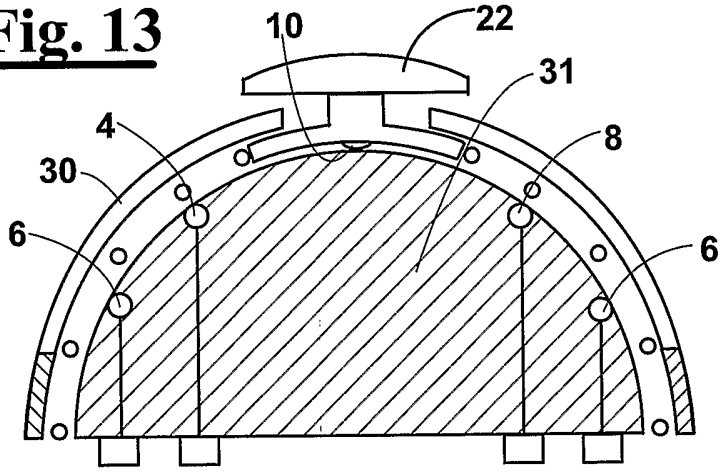


Fig. 14

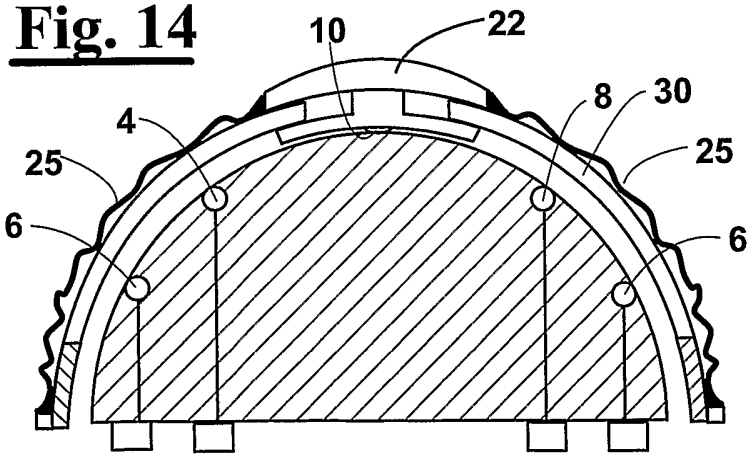


Fig. 15

Fig. 15

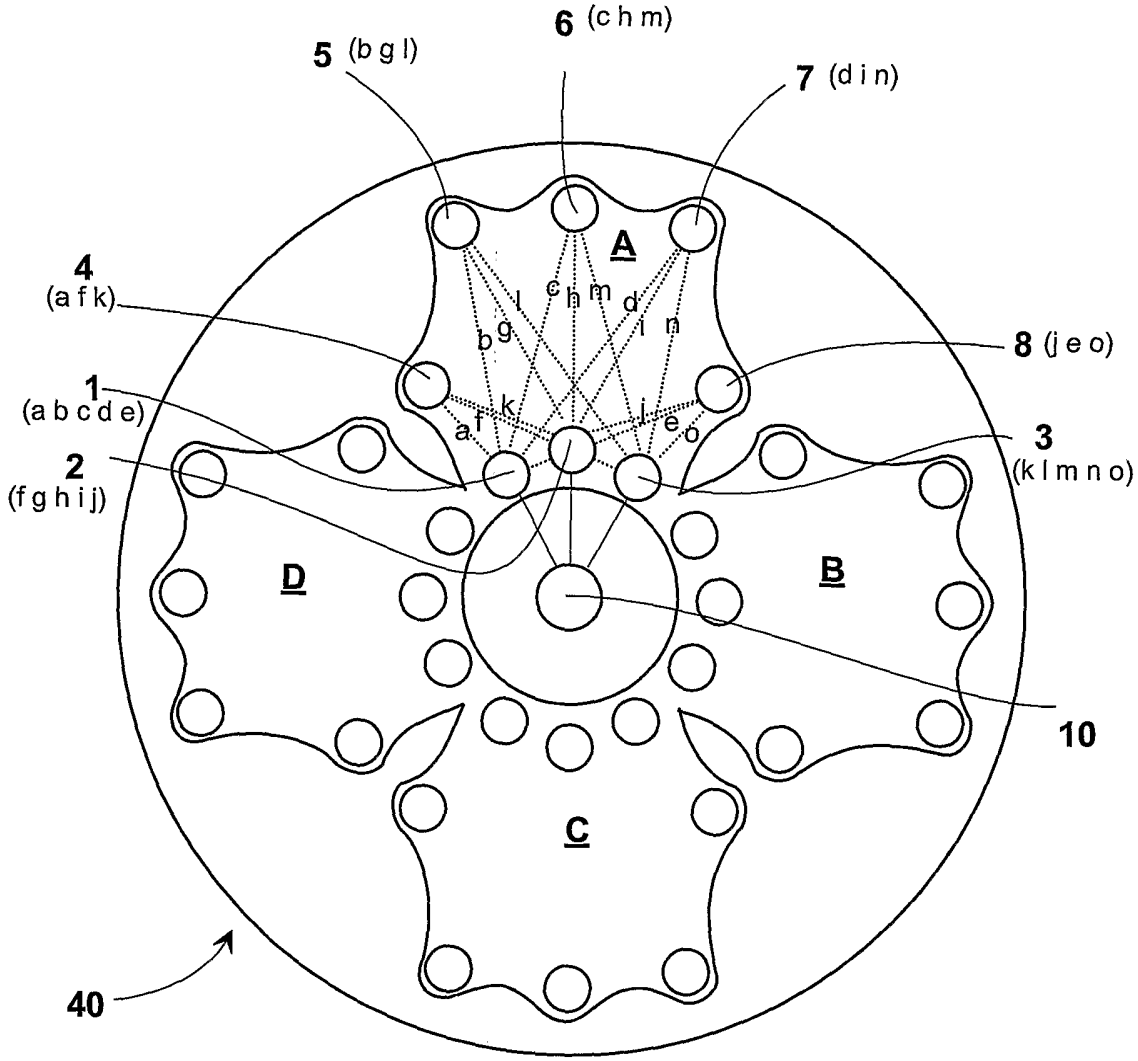


Fig. 16

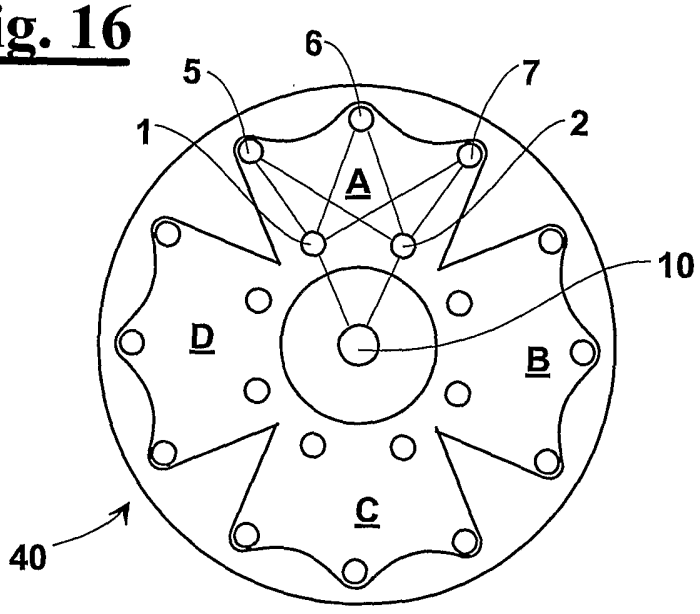


Fig. 17

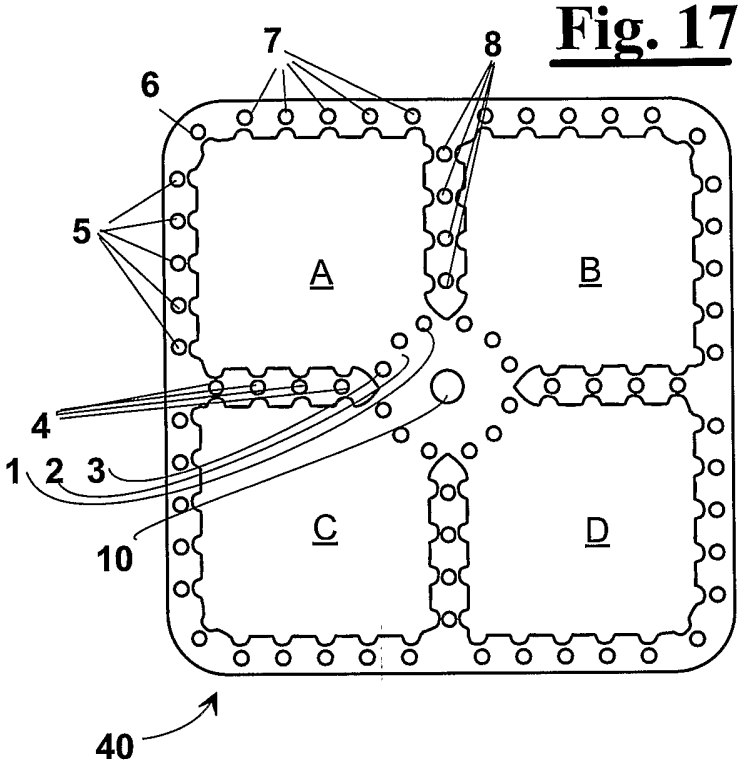


Fig. 18

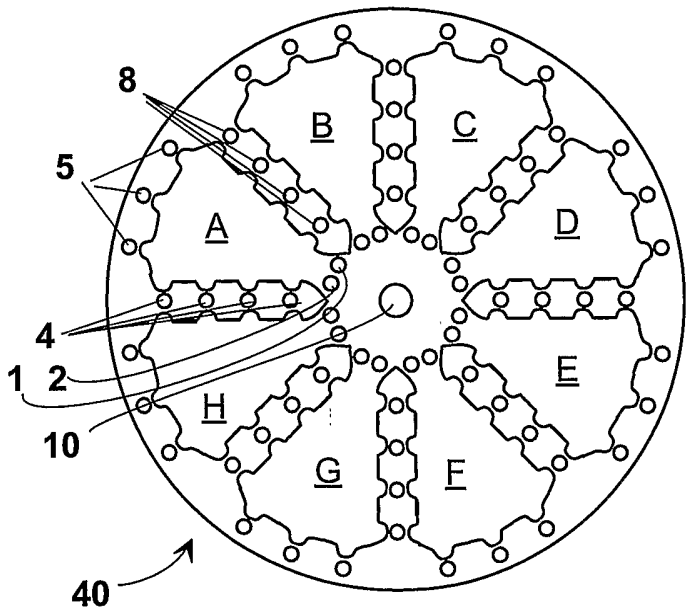


Fig. 19

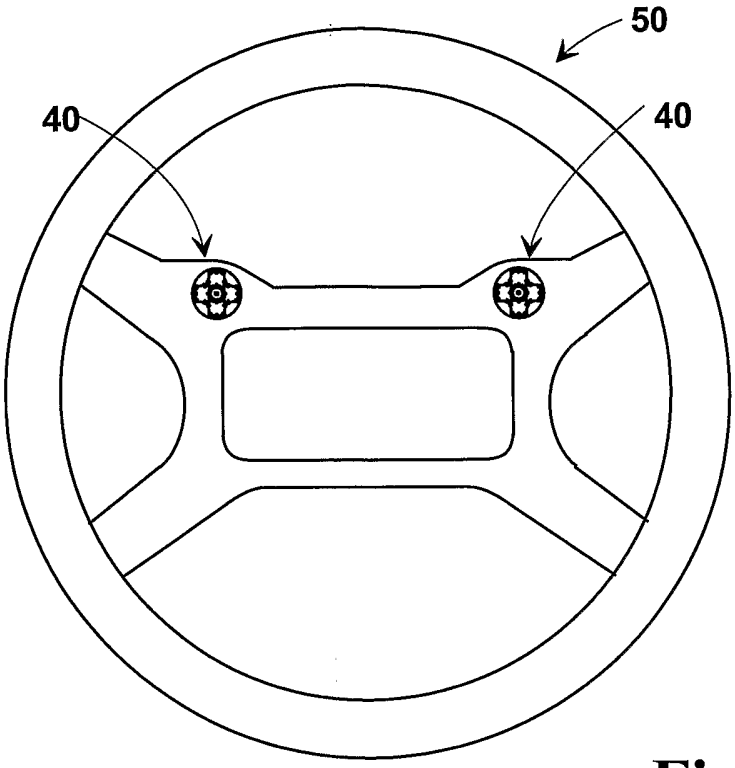


Fig. 20

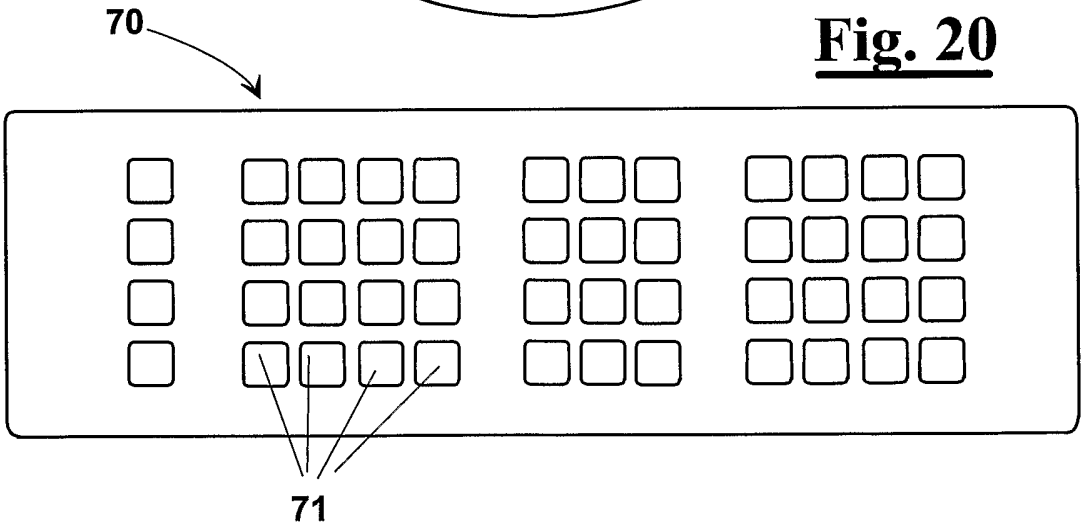


Fig. 21

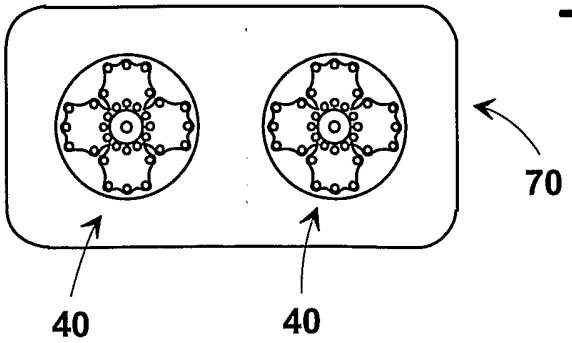


Fig. 22

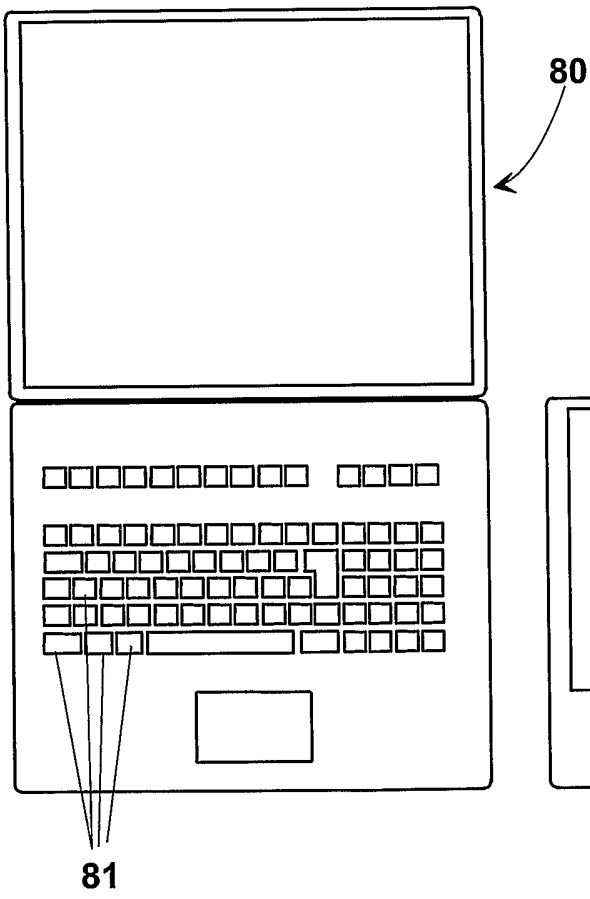


Fig. 23

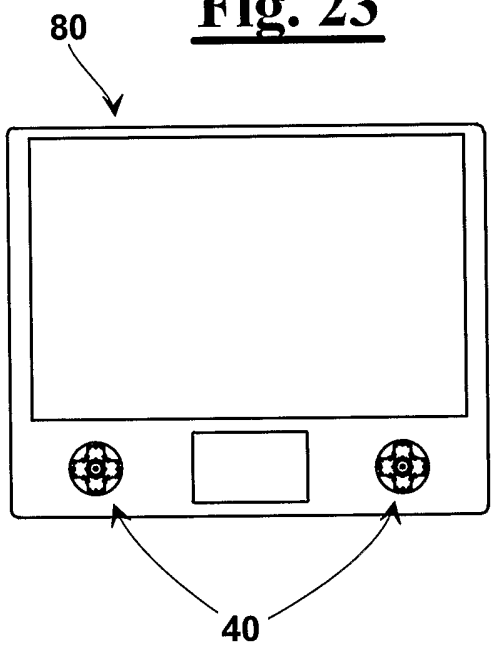


Fig. 24

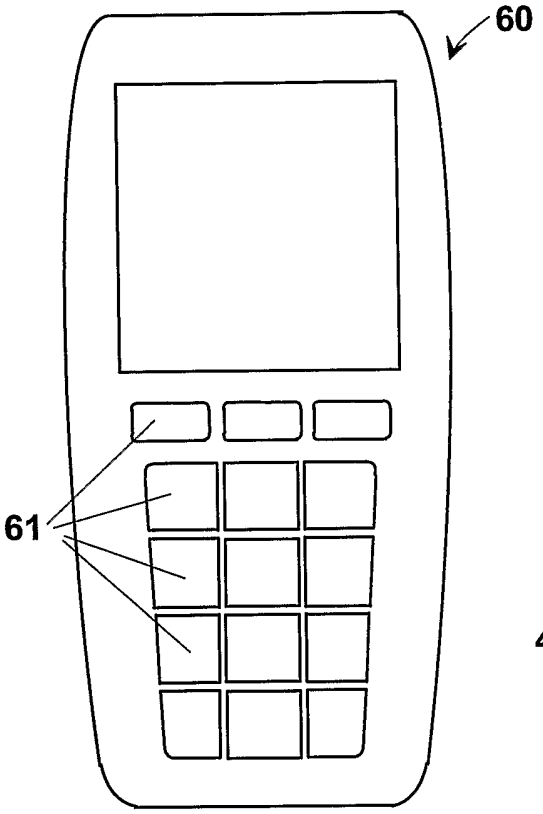


Fig. 25

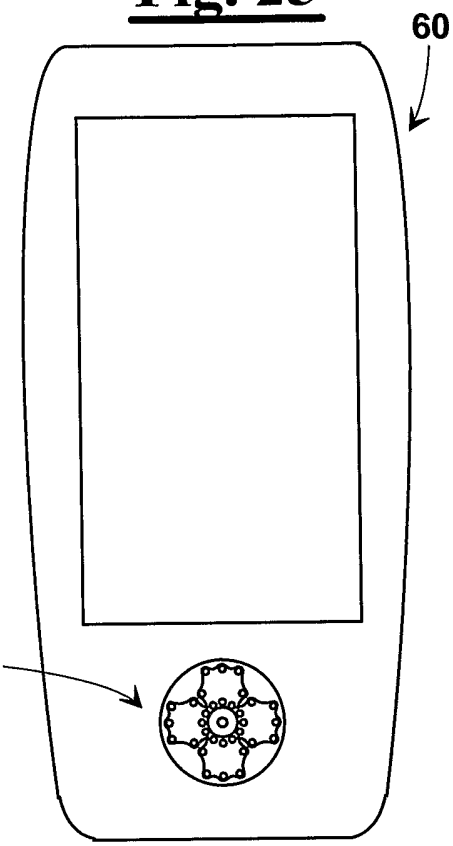


Fig. 26