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(54) **EXERCISE APPARATUS**

ÜBUNGSGERÄT

APPAREIL D'EXERCICE

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Description

[0001] This invention relates to exercise apparatus, particularly of the type intended to develop reaction speed and agility.

[0002] Reaction display devices are known, such as the BATAK (Trade Mark) range of training devices where an array of illuminated targets is presented to the user, and these are lit up in turn according to random or repetitive programs. The user has to reach and touch each target when it is lit up, and touch sensitive sensors record the success rate in touching while the target is lit. The targets are arrayed over a range of positions including extreme high, low and wide positions as well as more central positions, and the rate of target change can be varied to match skill experience and fitness levels.

[0003] WO96/32164 discloses an exercise apparatus with the features of the preamble of claim 1.

[0004] Devices of this type are purely dependant on speed of reaction, and accuracy of response, with no requirement for higher mental skills.

[0005] The present invention seeks to introduce an element of mental skill, to encourage not only physical reaction speed, but also mental alertness.

[0006] According to the present invention there is provided a reaction display device comprising an array of targets, designed to present a variety of reach positions for a user, and further including an instruction display mounted for ready visibility by the user, wherein the instruction display and at least some of the targets are provided with means to display a selection from at least two variables.

[0007] According to an embodiment of the present invention there is provided a reaction display device, further including means of providing a signal to an instruction display for ready visibility by the user, such that the instruction display and at least some of the targets are provided with means to display a selection from at least two variables.

[0008] The instruction display identifies to the user the correct target within the array by displaying an image from a collection of variable images, such as a colour and / or shape, corresponding to the image displayed on one of the array of targets. The other targets may, simultaneously, or otherwise, display alternatives so as to distract the user. By providing a range of targets in sequence the monitor displays exercise routines.

[0009] The apparatus further includes a microprocessor to operate the instruction display and the array of targets, providing a sequence of images. The microprocessor can monitor the speed and accuracy of the user and vary the exercise routine accordingly. The exercise routine may alternatively be selected by the user. Both the variety of selected targets and speed of selection increase the level of work required by the user.

[0010] The reaction display device may be freestanding or wall mounted. In one embodiment of the invention the user would generally stand in front of the array.

[0011] At least some of the targets are each provided with means to display a selection from any of a range of variables, such as shapes and / or colour. The targets may be in the form of screens capable of displaying variable images, such as any of colour and shape. In one embodiment the target is to be illuminated selectively in any one of two or more colours. In one embodiment the targets are in the form of banks of different coloured lights, such as LEDs. The targets may contain a sensor. Contact with and /or movement over a target sends a signal to the computer. In this way the computer is informed as to whether the user has selected the correct target and how long that selection has taken since the instruction to reach for that target was provided on the instruction monitor.

[0012] The display monitor and / or all or part of the array, may be adjustable vertically, horizontally and / or pivotally, e.g. by being moveable on a suitable mounting or mountings.

[0013] The apparatus advantageously also includes a mat, which is to be placed adjacent, and ideally in front of, the reaction display device.

[0014] In order that the invention may be more readily understood an embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of an embodiment of exercise apparatus according to the invention;

Figure 2 is an elevation view of a reaction display device forming part of the exercise apparatus of Figure 1; and

Figure 3 is a plan view of an exercise mat forming part of the apparatus of Figure 1.

[0015] As shown in figure 1, exercise apparatus comprises an upright reaction display device 10 and an exercise mat 11, laid on the floor in front of the display device 10. A controlling computer 12 is provided connected to the device 14, and also to provide power to the mat 11, via a vibrator control unit 13. The mat 11 incorporates vibrating apparatus which is adapted to vibrate the whole area of the mat 11. In one embodiment of the invention the computer device is not located adjacent to the exercise area and may be in a remote location such as a gym supervisor's office.

[0016] The display device comprises a supporting frame with upright 14, 15 and upper and lower horizontal bars 16 and 17. The lower ends of the uprights may be adjustable for height, to place the lower bars 17 at a height in the range from for example 10 to 40cm. The said lower ends are mounted on a base plate 18.

[0017] An array of targets 20a-20h is distributed about the frame, and each target is adapted to be illuminated by activation of an LED lamp on instructions from the computer 12. Each target has a plurality of LEDs each to provide a different colour, for example three, one yellow, one blue and one red. One, two or all three LEDs

may be lit on instruction from the computer. Each target is also provided with a touch sensor, which signals to the computer when the target has been reached by the user.

[0018] The device 10 also includes a display screen 21 mounted so as to be adjustable in height, on a central column 22. This screen 21 is driven by the computer 12 and may display general information and instructions, but is primarily used to set tasks by way of an exercise routine. Additionally it may optionally be used to select the level of exercise required.

[0019] In figure 2, a possible exercise is shown where screen 21 instructs the user to touch the target which is flashing with a red light - but two targets 20c and 20d are illuminated - 20d for example showing a blue light and 20c a red light. The user has to discern the correct target, reach and touch it, in the time before the next target is illuminated. The speed at which new targets are presented can be controlled, to provide an exercise adapted to the user's capabilities and needs involving repeated reaching to targets at different ranges, heights and directions.

[0020] The mat 11 is provided with an array, in the embodiment shown nine in a three by three matrix, of areas such as circles 23 a-k which provide foot targets, to be reached in accordance with instructions displayed on the screen 21. Each circle overlies a pressure detector, below the surface of the mat and within the mat, which indicates to the computer 12 that the user's foot has rested on the circle. The pressure detectors may be calibrated as weight measuring devices, so that a read-out of the user's weight can be given on demand, say at the beginning and end of a session.

[0021] In use, the user will stand on the mat 11 before the screen 21; and after warming up, engage in any of a number of possible exercises and or game routines. The reaction display 10 may be used on its own, in simple reaction mode (touching lit up targets in turn in a rapid response), and also in a mode where recognition of a variable, say of at least one of colour and shape, or some exercise of thought is required. Further, reaching for targets may be combined with stepping on selected circles on the mat, requiring a further level of limb-eye coordination.

[0022] The mat may optionally be in vibrating mode, or non-vibrating mode as desired.

[0023] The screen 21 may optionally be used to play video games, or mental contests, which may if desired involve a physical response (e.g. alternate answers may be displayed on or in relation to targets, selection of the correct answer being by touching the correct target).

[0024] Possible exercises include simply pressing the screen as quickly as possible, as in the known BATAK (Trade Mark) exerciser; to press the target diametrically opposite one indicated on the screen 21, to press the colour indicated on the screen 21 (the targets may each have a different colour or patch or surround, to play mathematical or logic games, or quizzes (for example on a sporting theme).

[0025] The display device may be wall mounted, and the targets may be provided with touch screens which display colours or other matter as instructed by the computer.

5 [0026] The display device and mat may be used together or separately, to provide a variety of cardio-exercises and / or muscle building exercises.

10 [0027] The above description of the invention provided above is by way of illustration only. Many modifications and variations are possible, without departing from the scope of the invention as defined in the appended claims.

Claims

- 15 1. Exercise apparatus comprising a reaction display device (10) comprising an array of targets (20a-20h) designed to present a variety of reach positions for a user, and further including an instruction display (21) mounted for ready visibility to the user, **characterised in that** the instruction display (21) and at least some of the targets (20a-20h) are provided with means to display a selection from at least two variables.
- 20 2. Apparatus according to claim 1 further including means (12) to provide a signal to the instruction display (21), such that the instruction display (21) and said at least some of the targets (20a-20h) are activated to display said selection.
- 25 3. Apparatus according to claim 1 or 2, wherein the instruction display (21) is operable to identify a correct target (20a-20h) to the user within the array, and includes means (12) to display an image from a plurality of variable or inter-changeable images, said image corresponding to the image displayed on one of the array of targets (20a-20h).
- 30 4. Apparatus according to claim 3, wherein the other targets (20a-20h) arranged to be actuated to display alternative images so as to distract the user.
- 35 5. Apparatus according to any one of claims 1 to 4, wherein the exercise apparatus further includes a microprocessor (12) to operate the instruction display (21) and the array of targets (20a-20h), and provide a sequence of respective images selected from the plurality of images to each of the instruction display (21) and targets (20a-20h), selecting different targets (20a-20h) at a speed to form an exercise routine by reaching to touch the sequence of correct targets (20a-20h).
- 40 6. Apparatus according to claim 5 wherein the microprocessor (12) is adapted to monitor the speed and accuracy of the user's response, and to vary the instructions to the instruction display (21) and targets

(20a-20h).

7. Apparatus according to Claim 5 or 6, wherein the targets (20a-20h) are provided with touch sensitive sensors the outputs of which are connected to the microprocessor (12).
8. Apparatus according to any preceding claim wherein the reaction display device (10) is free-standing or wall mounted, so that the user can stand in front of the array (20a-20h).
9. Apparatus according to any preceding claim wherein at least some of the targets (20a-20h) are each provided with means to display a selected one or more from a range of visual displays.
10. Apparatus according to claim 9 wherein the said targets (20a-20h) are in the form of screens adapted to display a range of images.
11. Apparatus according to claim 9 or 10, wherein the targets (20a-20h) are adapted to be illuminated in any one of two or more colours.
12. Apparatus according to claim 11 wherein the targets (20a-20h) have banks of different coloured lights, such as LEDs.
13. Apparatus according to claim 7 wherein the microprocessor (12) is adapted to determine, in accordance with input from the touch sensitive sensors, whether the correct target (20a-20h) has been selected by the user, and the time lapse of the user's reaction to the instruction display (21).
14. Apparatus according to any preceding claim, wherein the instruction display (21) and/or all or part of the array (20a-20h) is adjustable vertically, horizontally and/or pivotally, being mounted on a suitable mounting or mountings.
15. Apparatus according to any preceding claim which further includes a mat (11), to be placed adjacent and preferably in front of the reaction display device (10).

Patentansprüche

1. Trainingsgerät, umfassend eine Reaktionsanzeigevorrichtung (10), welche ein Gitterfeld von Zielen (20a-20h) aufweist, die gestaltet sind, um eine Vielzahl von erreichbaren Positionen für einen Benutzer darzustellen, und des Weiteren eine Anweisungsanzeige (21) umfasst, welche für einfache Sichtbarkeit für den Benutzer angebracht ist, **dadurch gekennzeichnet, dass** die Anweisungsanzeige (21) und

wenigstens einige der Ziele (20a-20h) mit Mitteln ausgestattet sind, um eine Auswahl von wenigstens zwei Variablen anzuzeigen.

2. Vorrichtung nach Anspruch 1, des Weiteren umfassend Mittel (12), um der Anweisungsanzeige (21) ein Signal zur Verfügung zu stellen, so dass die Anweisungsanzeige (21) und die wenigstens einigen der Ziele (20a-20h) aktiviert werden, die Auswahl anzuzeigen.
3. Vorrichtung nach Anspruch 1 oder 2, wobei die Anweisungsanzeige (21) betreibbar ist, um ein richtiges Ziel (20a-20h) für den Benutzer innerhalb des Gitterfelds zu identifizieren, und Mittel (12) umfasst, um ein Bild aus einer Mehrzahl von Variablen oder untereinander austauschbaren Bildern anzuzeigen, wobei das Bild dem Bild, welches auf einem der Ziele (20a-20h) auf dem Gitterfeld dargestellt ist, entspricht.
4. Vorrichtung nach Anspruch 3, wobei die anderen Ziele (20a-20h) angeordnet sind, um aktiviert zu werden, alternative Bilder anzuzeigen, um so den Benutzer abzulenken.
5. Vorrichtung nach einem beliebigen der Ansprüche 1 bis 4, wobei das Trainingsgerät des Weiteren einen Mikroprozessor (12) umfasst, um die Anweisungsanzeige (21) und das Gitterfeld von Zielen (20a-20h) zu betreiben und um eine Abfolge der jeweiligen Bilder, welche aus der Mehrzahl von Bildern ausgewählt werden, für sowohl die Anweisungsanzeige (21) als auch das Gitterfeld von Zielen (20a-20h) bereitzustellen, wobei unterschiedliche Ziele (20a-20h) mit einer Geschwindigkeit ausgewählt werden, um einen Übungsablauf durch berührendes Erreichen der Abfolge von richtigen Zielen (20a-20h) auszubilden.
6. Vorrichtung nach Anspruch 5, wobei der Mikroprozessor (12) ausgelegt ist, um die Geschwindigkeit und Genauigkeit der Reaktion des Benutzers zu überwachen und um die Anweisungen an die Anweisungsanzeige (21) und die Ziele (20a-20h) zu variieren.
7. Vorrichtung nach Anspruch 5 oder 6, wobei die Ziele (20a-20h) mit berührungsempfindlichen Sensoren ausgestattet sind, deren Ausgaben mit dem Mikroprozessor (12) verbunden sind.
8. Vorrichtung nach einem der vorangehenden Ansprüche, wobei die Reaktionsanzeigevorrichtung (10) freistehend oder wandmontiert ist, so dass der Benutzer vor dem Gitterfeld (20a-20h) stehen kann.
9. Vorrichtung nach einem der vorangehenden An-

sprüche, wobei wenigstens einige der Ziele (20a-20h) jeweils mit Mitteln vorgesehen sind, um eine oder mehrere aus einem Umfang von visuellen Anzeigen anzuzeigen.

10. Vorrichtung nach Anspruch 9, wobei die Ziele (20a-20h) in der Gestalt von Schirmen vorliegen, welche ausgelegt sind, um einen Umfang von Bildern darzustellen.
11. Vorrichtung nach Anspruch 9 oder 10, wobei die Ziele (20a-20h) ausgelegt sind, um in einer beliebigen von zwei oder mehr Farben beleuchtet zu werden.
12. Vorrichtung nach Anspruch 11, wobei die Ziele (20a-20h) Bänke von unterschiedlichen gefärbten Lichtern, wie LEDs, aufweisen.
13. Vorrichtung nach Anspruch 7, wobei der Mikroprozessor (12) ausgelegt ist, um in Übereinstimmung mit der Eingabe von den berührungsempfindlichen Sensoren zu bestimmen, ob das richtige Ziel (20a-20h) durch den Benutzer ausgewählt worden ist, und um die Zeitverzögerung der Reaktion des Benutzers auf die Anweisungsanzeige (21) zu bestimmen.
14. Vorrichtung nach einem der vorangehenden Ansprüche, wobei die Anweisungsanzeige (21) und/oder die Gesamtheit oder ein Teil des Gitterfelds (20a-20h) vertikal, horizontal und/oder gedreht einstellbar ist(sind), wobei sie auf einer geeigneten Befestigung oder Befestigungen angebracht sind.
15. Vorrichtung nach einem der vorangehenden Ansprüche, welche des Weiteren eine Matte (11) umfasst, um benachbart und vorzugsweise vor der Reaktionsanzeigevorrichtung (10) angeordnet zu sein.

Revendications

1. Appareil d'exercice, comprenant un dispositif d'affichage de réaction (10) comprenant un réseau de cibles (20a-20h) conçues pour présenter une série de positions d'extension à l'intention d'un utilisateur, et comportant en outre un affichage d'instructions (21) monté de façon à être directement visible par l'utilisateur, **caractérisé en ce que** l'affichage d'instructions (21) et au moins certaines des cibles (20a-20h) sont pourvus de moyens permettant d'afficher une sélection parmi au moins deux variables.
2. Appareil selon la revendication 1, comportant en outre un moyen (12) permettant de fournir un signal à l'affichage d'instructions (21), de manière à activer l'affichage d'instructions (21) et lesdites au moins certaines des cibles (20a-20h) pour leur faire afficher ladite sélection.

3. Appareil selon la revendication 1 ou 2, dans lequel l'affichage d'instructions (21) est apte à identifier une cible correcte (20a-20h) dans le réseau à l'intention de l'utilisateur, et comporte un moyen (12) permettant d'afficher une image parmi une pluralité d'images variables ou interchangeables, ladite image correspondant à l'image affichée sur l'une du réseau de cibles (20a-20h).
4. Appareil selon la revendication 3, dans lequel les autres cibles (20a-20h) sont destinées à être actionnées pour afficher des images de substitution dans le but de distraire l'attention de l'utilisateur.
5. Appareil selon l'une quelconque des revendications 1 à 4, comportant en outre un microprocesseur (12) permettant de piloter l'affichage d'instructions (21) et le réseau de cibles (20a-20h) et de fournir à l'affichage d'instructions (21) et à chacune des cibles (20a-20h) une séquence d'images respectives sélectionnées parmi la pluralité d'images, en sélectionnant des cibles (20a-20h) différentes à une certaine vitesse pour créer un programme d'exercice consistant à effectuer une extension pour toucher la séquence de cibles correctes (20a-20h).
6. Appareil selon la revendication 5, dans lequel le microprocesseur (12) est apte à contrôler la vitesse et la précision de la réponse de l'utilisateur et à modifier les instructions fournies à l'affichage d'instructions (21) et aux cibles (20a-20h).
7. Appareil selon la revendication 5 ou 6, dans lequel les cibles (20a-20h) sont pourvus de capteurs tactiles dont les sorties sont reliées au microprocesseur (12).
8. Appareil selon l'une quelconque des revendications précédentes, dans lequel le dispositif d'affichage de réaction (10) est autoportant ou à montage mural de façon à permettre à l'utilisateur de se tenir debout devant le réseau (20a-20h).
9. Appareil selon l'une quelconque des revendications précédentes, dans lequel au moins certaines des cibles (20a-20h) sont chacune pourvues de moyens permettant d'afficher au moins un affichage visuel sélectionné parmi une gamme d'affichages visuels.
10. Appareil selon la revendication 9, dans lequel lesdites cibles (20a-20h) prennent la forme d'écrans aptes à afficher une gamme d'images.
11. Appareil selon la revendication 9 ou 10, dans lequel les cibles (20a-20h) sont aptes à s'éclairer dans une couleur quelconque parmi au moins deux couleurs.
12. Appareil selon la revendication 11, dans lequel les

cibles (20a-20h) possèdent des batteries d'éléments lumineux de couleurs différentes tels que des DEL.

13. Appareil selon la revendication 7, dans lequel le microprocesseur (12) est apte à établir, en fonction d'entrées en provenance des capteurs tactiles, si la cible correcte (20a-20h) a été sélectionnée par l'utilisateur et la durée de la réaction de l'utilisateur à l'affichage d'instructions (21). 5
- 10
14. Appareil selon l'une quelconque des revendications précédentes, dans lequel l'affichage d'instructions (21) et/ou la totalité ou une partie du réseau (20a-20h) sont/est réglable/s verticalement, horizontalement et/ou par pivotement, au moyen d'un ou de plusieurs dispositifs de fixation adaptés. 15
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15. Appareil selon l'une quelconque des revendications précédentes, comportant en outre un tapis (11) destiné à être placé en position adjacente au dispositif d'affichage de réaction (10) et, de préférence, devant lui. 25
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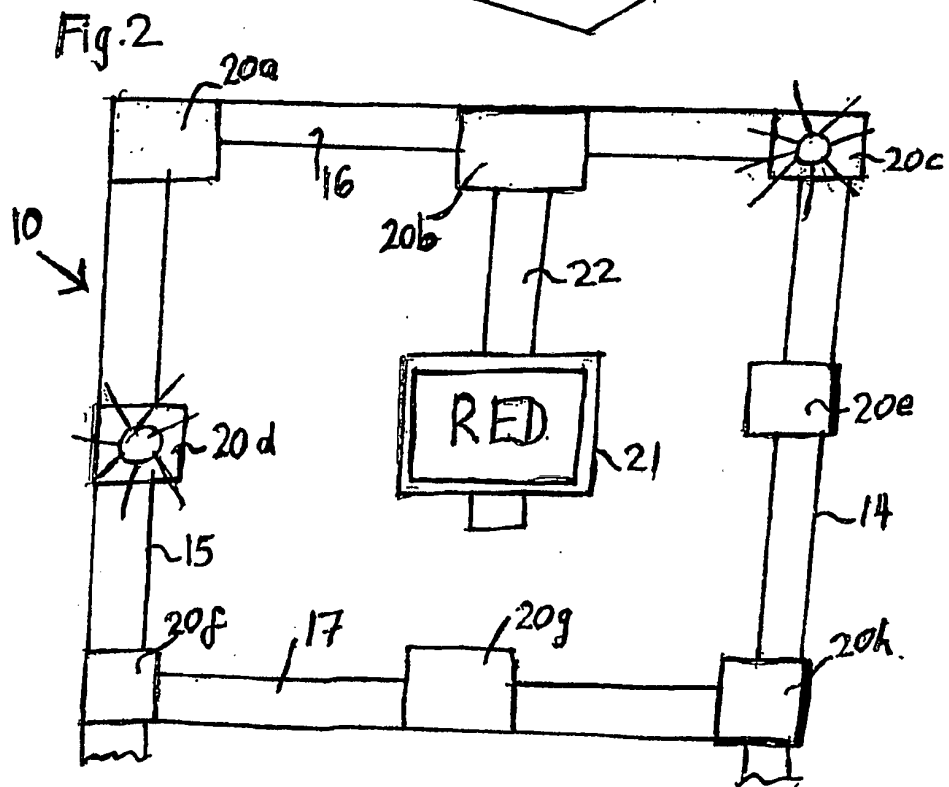
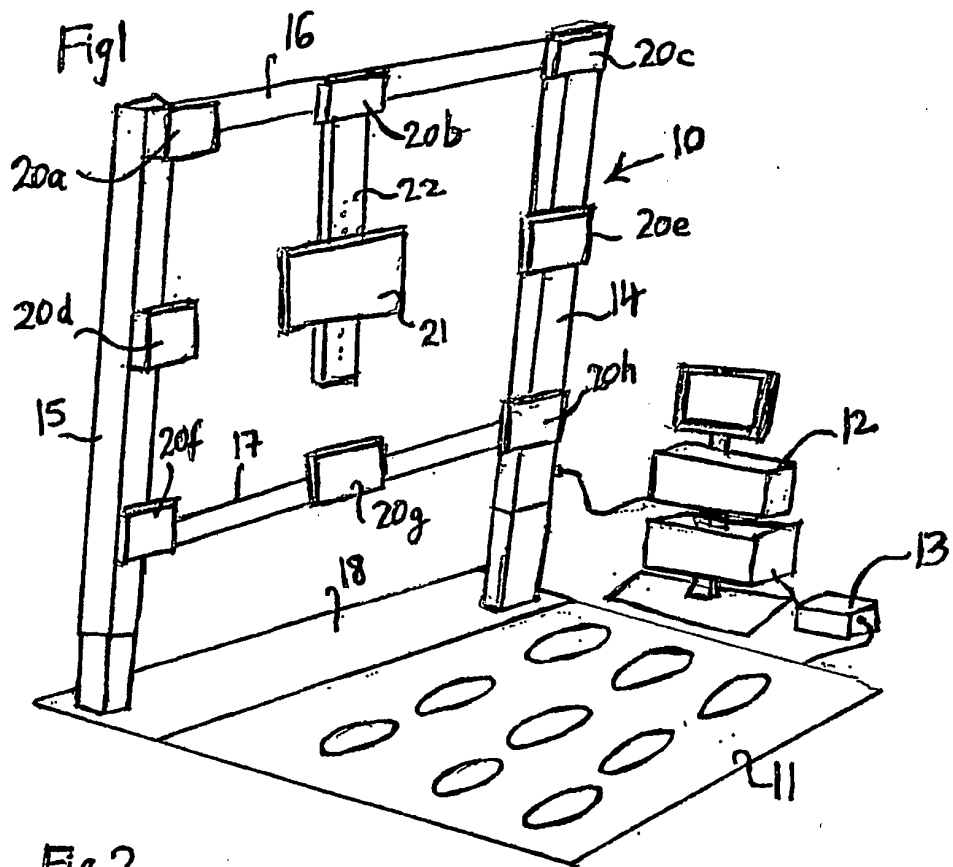
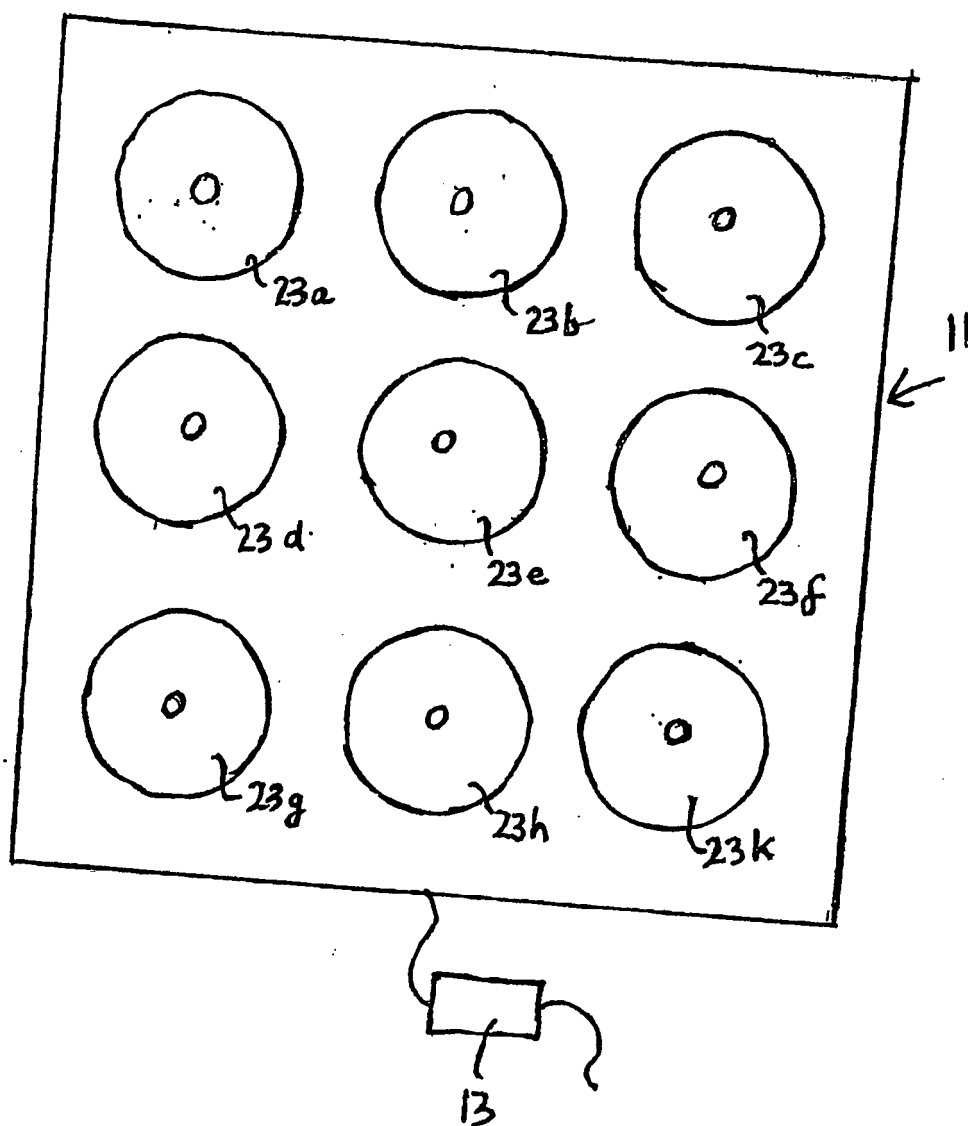


Fig. 3



REFERENCES CITED IN THE DESCRIPTION

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