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(54) **System for collecting and calculating bridge results.**

(57) A system for collecting and calculating bridge results, or for transmitting other information, originating from different options, to a computer, wherein the choice which determines the information is made by placing one or several chip(s) in a holder in a specific position. In this connection, each possibility or combination of possibilities for placing indicates a different choice. By means of a reading apparatus, the choices made can be read in, by means of coding the chip, in a computer for the further processing of the read-in information.

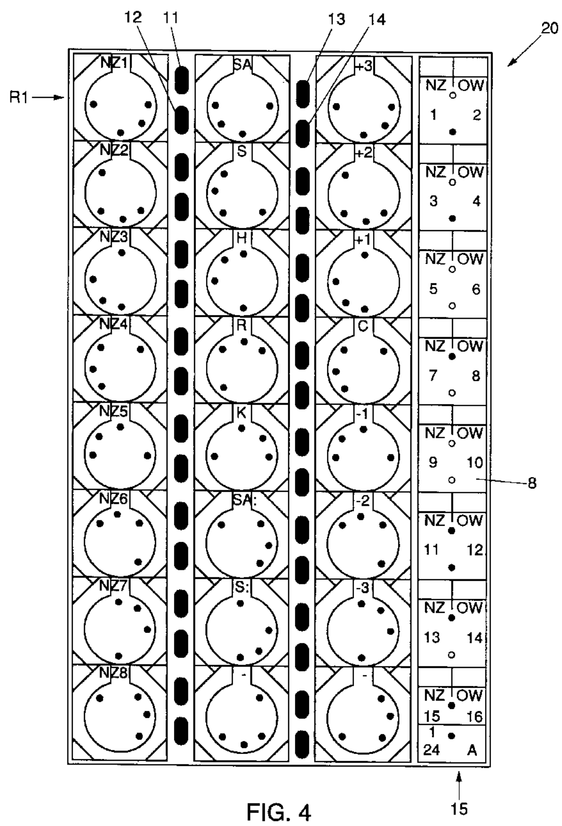

FIG. 4

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The invention relates to collecting, reading in quickly and calculating automatically results of, for instance, bridge matches.

For the automatic processing of the results of bridge matches, the "contracts" arising from the biddings and the corresponding results of all games played by a number or group of pairs should be recorded and read in in for instance a computer, after which the result for that group of pairs can be calculated.

An accepted method for this is filling in a scorecard per game, on which scorecard the contract, the result and the total number of points of the score, as well as the number of the pair played against, are filled in. After a match, it is calculated from the total number of points scored which pair has played best and is the winner.

In many clubs the game is played in competition once a week, and usually the calculation of the results afterwards is a very time-consuming business.

This is caused by the fact that all written results, on average about 168 results per group, have to be processed.

The object of the present invention is to provide a solution to this, enabling a very quick calculation of the result after the games have been played in different rounds. To realized this, in accordance with the invention, the results are not written on a scorecard but indicated by means of chips which are placed in a holder.

The chips and the holder are shaped such that the chips can be placed in a holder in a number of different positions which are readily distinguishable from one another. Each position corresponds to a predetermined choice or score. In a practical embodiment, the chips may be octogonal, so that per chip, if used on two sides, 16 different choices are possible. To indicate a bridge score, three chips per game played are slid into the holder belonging to a game, according to the contract which is bid and the corresponding result.

After all games have been played, via a reading apparatus connected to a processing unit, such as a computer, it can be established per game, by means of light sensors and a univocal hole pattern in each chip placed, which contracts are bid and which results have accordingly been achieved per pair.

Of course, instead of a hole pattern, any other form of coding could be used as well, such as, for instance, reflecting surfaces arranged on or in the chips.

The above will be further explained hereinafter with reference to the accompanying drawings. In these drawings:

Fig. 1 shows, by way of example, a table of possible contracts in the bridge game;

Fig. 2 schematically shows an example of a chip for use in the invention;

Fig. 3 schematically shows two signal forms which may occur when the invention is used;

Fig. 4 is a schematic front view of an example of a holder for chips;

Fig. 5 is a view of a reading apparatus capable of cooperating with a holder for chips; and

Fig. 6 shows a section, taken on the line VI-VI in Fig. 5.

Fig. 1 shows a table of the possible contracts, the first column indicating, per two pairs playing against each other, the different possibilities with regard to the number of tricks bid by one of the pairs in the north-south (NZ) or in the east-west (OW) direction. The second column indicates the possibilities with regard to the suit established and, possibly, a double, designated by ":", or a redouble, designated by "::", and the third column represents the result gained. A number of the results have double meanings, which, however, are mutually exclusive. The abbreviation "ARB" indicates that the score has been established by arbitration and has to be introduced by hand. Hence, a game can be represented by three chips: a first chip representing one of the possibilities of the first column of table 1 (the column "bidding"); a second chip representing one of the possibilities of the second column and a third chip representing the result (column 3).

For this purpose, the chips can be placed in a suitable holder in a predetermined number of predetermined positions, each position corresponding to a predetermined option.

Fig. 2 shows one side of a chip which can be used two-sidedly, having a hole pattern provided therein, enabling univocal establishment of the position of the chip in question by means of a suitable read-out apparatus comprising suitable detection elements, such as, for instance, light-emitting diodes (LEDs) and photosensors.

For this purpose, when the holder with the chips is slid through the read-out apparatus, it is determined at the positions (1), (2) and (3), and at the positions (4), (5) and (6), whether or not a hole is present, allowing determination of the choice (position) for the chip in question.

In a practical embodiment, eight rows of three chips can be arranged per holder, because the game is usually played by not more than 16 pairs per group. Per round to be played, a next row of chips is placed in the holder by the playing pairs to record the score.

Fig. 4 schematically shows an example of a holder 20 for the chips. These chips, shown in dotted lines, are preferably disposed in the holder in the manner of roof tiles, as shown, so as to limit the dimensions of the holder. The chips can be slid into the holder from the top downward, while except for the text at the top and the holes for the coding, all other texts are preferably covered by the holder. To register the data relating to a game, the holder may for instance by scanned, by a suitable reading device, in one direction transverse to the row of chips belonging to the game. For this purpose, the holder may for instance be scanned while being slid from the bottom upward through the reading apparatus, or from the top downward through the reading apparatus. In the example shown, by the side of the chips, a strip of paper (8) may further be slid into the holder, on which the total number of points of the contract which is bid and the corresponding result can be written, either in the NZ line or in the OW line.

This total number of points need not be fed to the computer, but only serves to enable, at the end of the game, comparison of the total number of points gained with that of the other pairs which have already played the game in question. On this strip of paper, it may also be printed or written in advance which pairs have to play against each other in which round, to avoid errors being made during filling in.

The positions (1), (2) and (3), and the positions (4), (5) and (6) of the possible holes in the chips form two groups, which, if so desired, can be read one after the other instead of simultaneously, utilizing at least partly the same detectors. In a first step, the top half of the chips (positions (1), (2) and (3)) in one row may for instance be read, and in a second step, after the holder and the reading apparatus have shifted in vertical direction relative to each other (shown in Fig. 4), the bottom half of the chips (positions (4), (5) and (6)) may then be read. If the positions (1), (2) and (3), or (4), (5) and (6) were always in line or had accurately the same relative positions, the same three pairs of LEDs and sensors could always be used for each chip. However, in the example shown, the positions (2) and (5) deviate in opposite sense from the adjacent positions. Consequently, for these positions separate detectors are required in the reading apparatus, for instance two parallel connected LEDs and corresponding light detectors.

Of course, it is also possible to design the chips such that even more groups of positions can be read in succession in different positions of the holder relative to the reading apparatus, or, by contrast, such that all positions are read simultaneously. In the latter case, in the example shown, each chip requires six light barriers, i.e. six pairs of one light-emitting element and one light-sensitive element.

To determine, when the chips are being read out, of which row and at which position the chips are read out, two additional light-emitting diodes with corresponding photosensors may further be provided. The openings 11-14 in row R_1 for these two sensors are fixedly provided, per row and per position, in the holder and have an elongated shape, shifted slightly relative to each other, so that when the holder is slid through the reading apparatus, two signals P_{11}-P_{14} are produced as indicated in Fig. 3. In the example shown, the openings are always located between the first and the second receiving place for a chip, and between the second and the third receiving place for a chip of a row. The openings are provided in the holder such that at the moment when the two signals, i.e. the signals of the openings 11 and 13 or of the openings 12 and 14, are "high" (7), the other photodiodes are positioned precisely under the hole pattern in the chips, either at the positions (1), (2) and (3) or at the positions (4), (5) and (6) as shown in Fig. 2.

In addition to the LEDs and photosensors which have already been mentioned, two additional LEDs with corresponding photosensors are preferably provided. The first of these photosensors indicates whether a holder has been slid into the read-in apparatus and the second photosensor is arranged under a series of holes 15 provided in the strip of paper on which the total number of points can be filled in. By means of these last holes, a code is read in serially when the holder is being slid through the reading apparatus, which code indicates the game number, the group and the playing system.

When two holes are used in the section of the strip of paper belonging to each row of chips, a code of 16 bits is formed, which is sufficient for representing the desired data. Preferably, the holes 15 lie in one column, as is shown, but this is not required.

When the holder is being slid through the read-in apparatus, a counter is employed to indicate the row number and the position in the row. This counter is controlled by the two signals as indicated in Fig. 3 and may, due to the nature of these signals, in particular the fixed time or phase difference, count forward and backward. In this manner, the correct position of the holder in the read-in apparatus is always known and errors can never arise, not even in the case where the holder is withdrawn slightly again while being slid through.

Of course, it is also possible to provide the holder itself with a readable code, indicating at each row the number of the row. This may again be a hole pattern which may or may not be formed by means of chips.

The reading apparatus has such a construction and such a low power consumption that feed from a serial gate of a computer is possible. Hence, no separate adapter has to be used for the feed.

Preferably, the reading apparatus comprises a small microprocessor which reads out the chips when they are being slid through and simultaneously transmits the information read to a computer via the serial gate.

As more information enters via the photosensors than is necessary, it can also be determined whether errors are read, which are subsequently passed on to the computer as well.

In order to prevent the possibility that the score of the pairs which have already played a particular game is seen in advance, the holder may be provided with a cover or case or the like. If so desired, this cover or the like may be made of infrared light-transmitting plastic, enabling, in combination with infrared light-emitting LEDs and photosensors sensitive to infrared light, the chips in the holders to be read by the reading apparatus even when the cover is closed.

Apart from bridge matches, this read-out method by means of chips may of course also be used for the quick transmission of other information, originating from different options, to a computer.

Fig. 5 shows an example of a reading apparatus 21 wherein a holder 20 can be read out. The reading apparatus is shown in front view in Fig. 5 and in section, taken on the line VI-VI, in Fig. 6. In Fig. 6, the light-emitting elements and the photosensitive elements have been indicated by small circles, while it is also indicated which positions of the possible holes in the chips are read by each pair of elements.

The reading apparatus 21 has a housing 22 comprising a slot 23 through which a holder 20 can be slid in such a manner that each time a row of chips can be slid between the detection elements, disposed opposite each other, in order to be read out. In Fig. 5, the positions of the detection elements are indicated by broken lines 30-41.

The lines 30-32, 34-36 and 38-40 correspond to possible locations for holes in chips. The line 33 corresponds to detection elements 42 (Fig. 6) which cooperate with the holes 11, 12 in the holder. Likewise, the line 37 corresponds to detection elements 43 (Fig. 6) for the holes 13, 14 in the holder. The line 41 corresponds to the holes 15 in the strip of paper 8. By sliding a holder comprising chips through the slot 23, the rows of chips can be read out consecutively.

It is observed that after the foregoing various modifications readily occur to a skilled person. For instance, the reading apparatus could be adapted for reading more than one row of chips at the same time. Also, the reading apparatus may comprise a microprocessor and display device of its own, or may be coupled to a separate processor. The chips may have a different shape, as long as it is possible to place the chips in the holder in predetermined positions, distinguishable from each other. These and similar modifications are understood to fall within the scope of the invention.

Claims

1. A system for collecting information originating from different options and transmitting it to a processing unit, in particular suitable for collecting, transmitting and calculating the results of bridge games, characterized by a holder capable of receiving one or more chips, said chips being provided with a code and capable of being placed in the holder in a plurality of possible positions, each position or combination of positions representing a different choice; and by a reading device capable of cooperating with the holder for reading out the position of the chips in the holder.

2. A system according to claim 1, characterized by a processor connected to the reading device.

3. A system according to claim 1 or 2, characterized by a display device for displaying the read-out information or information derived therefrom.

4. A system according to any one of the preceding claims, characterized in that the reading device comprises a microprocessor.

5. A system according to any one of the preceding claims, characterized in that the chips are provided with a fixed hole pattern capable of representing different information by placing a chip in different positions.

6. A system according to claim 5, characterized in that the reading device comprises a plurality of pairs of cooperating detector elements capable of detecting the presence of a hole or the absence thereof in a chip located in a holder disposed opposite the detector elements.

7. A system according to claim 6, characterized in that the pairs of detector elements always consist of one light-emitting element and one light-sensitive element.

8. A system according to claim 7, characterized in that the detector elements emit or receive infrared light.

9. A system according to any one of the preceding claims, characterized in that the holder comprises a code and that the reading device comprises means for detecting the code of the holder so as to determine the correct read-out position of the holder relative to the reading device.

10. A system according to claim 9, characterized in that the holder is provided with at least two elongated openings, shifted slightly relative to each other, and that the reading device comprises corresponding detector elements, the correct reading position of the holder being determined by the simultaneous occurrence of detection signals from the detector elements cooperating with two different elongated openings.

11. A system according to any one of the preceding claims, characterized in that the chips are octogonal discs, usable on two sides, each provided

with the same hole pattern.

12. A system according to any one of claims 1-4, characterized in that the chips comprise reflecting surfaces serving as a code, the reading device comprising corresponding detector elements with emit light or receive reflected light.

13. A system according to any one of the preceding claims, characterized in that the holder is capable of receiving a plurality of rows of chips and comprises a code indicating the row number, said code being detectable by the reading device.

14. A system according to any one of the preceding claims, characterized in that the reading device is provided with a slot comprising, in opposite walls, pairs of detector elements, the holder having dimensions such that, for reading out the information, it can be slid through the slot.

15. A system according to any one of claims 8-14, characterized in that the holder comprises an non-transparent yet infrared light-transmitting cover.

16. A system according to any one of the preceding claims, characterized in that the chips are placed in the holder in the manner of roof tiles.

17. A system for collecting and calculating bridge results according to any one or several of the preceding claims, characterized in that for recording the contract to be played and the corresponding result, three chips are used, the first chip indicating the number of tricks which are bid and the table position of the bidder, the second chip indicating the suit which is bid and a possible "double" or "redouble", and the third chip indicating the result gained.

18. A method for collecting information originating from different options and transmitting it to a processing unit, in particular suitable for collecting, transmitting and calculating bridge results, characterized in that the options are determined by chips provided with a code, capable of being placed in a holder in different positions and locations for determining said information, whereupon the position and the location of the chips in the holder are read out by means of a reading device and the read-out information is fed to a processor.

19. A method according to claim 18 or 19, characterized in that polygonal chips are used, each provided with a fixed hole code, identical for all chips, and capable of being placed in the holder in different positions.

20. A method according to claim 18, characterized in that a holder is used accommodating a plurality of rows of chips and comprising means for distinguishing the rows.

	Bidding	Colour	Results
1	-	-	-
2	NZ 1	K	-1
3	NZ 2	R	-2
4	NZ 3	H	-3
5	NZ 4	S	-4
6	NZ 5	SA	-5
7	NZ 6	K:	-6
8	NZ 7	R:	-7
9	PAS	H:	ARB
10	OW1	S:	+6/-8
11	OW2	SA:	+5/-9
12	OW3	K::	+4/-10
13	OW4	R::	+3/-11
14	OW5	H::	+2/-12
15	OW6	S::	+1/-13
16	OW7	SA::	C

FIG. 1

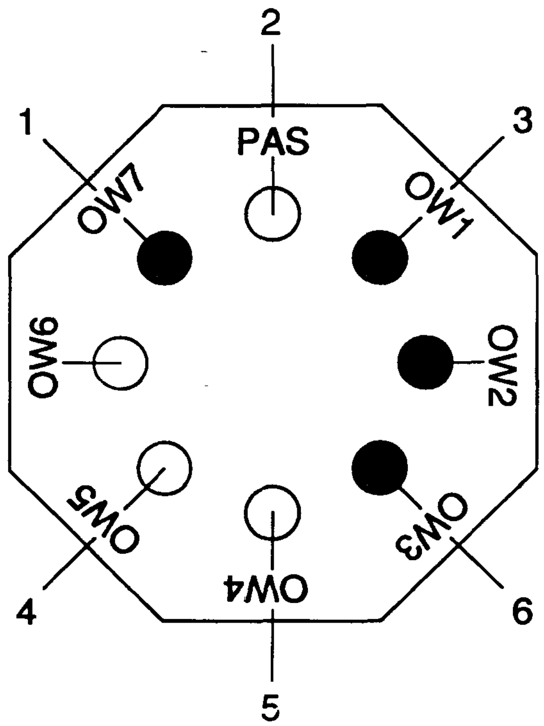


FIG. 2

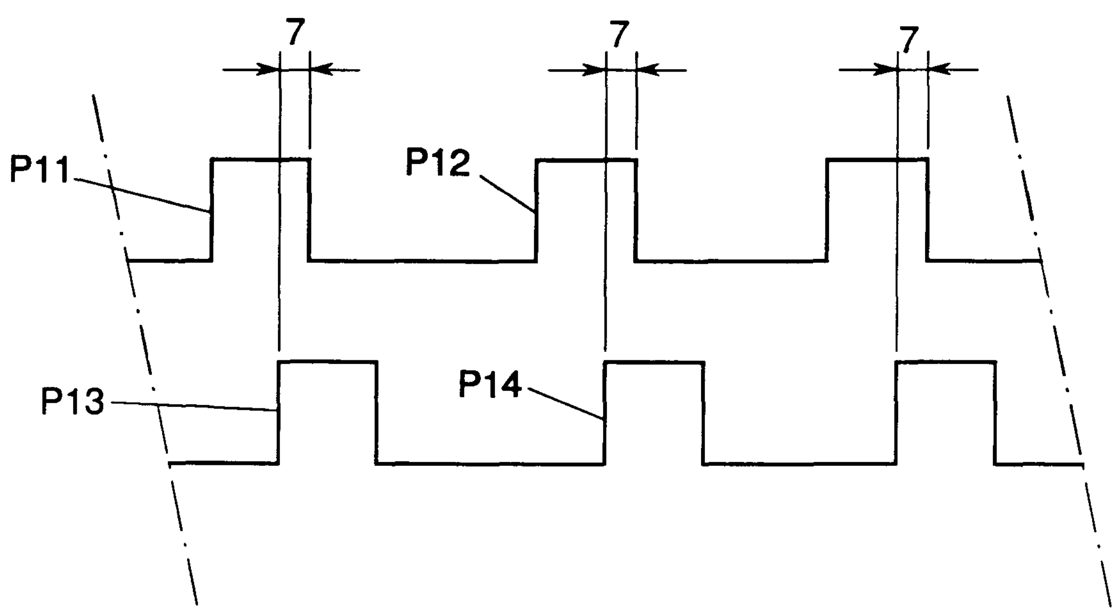


FIG. 3

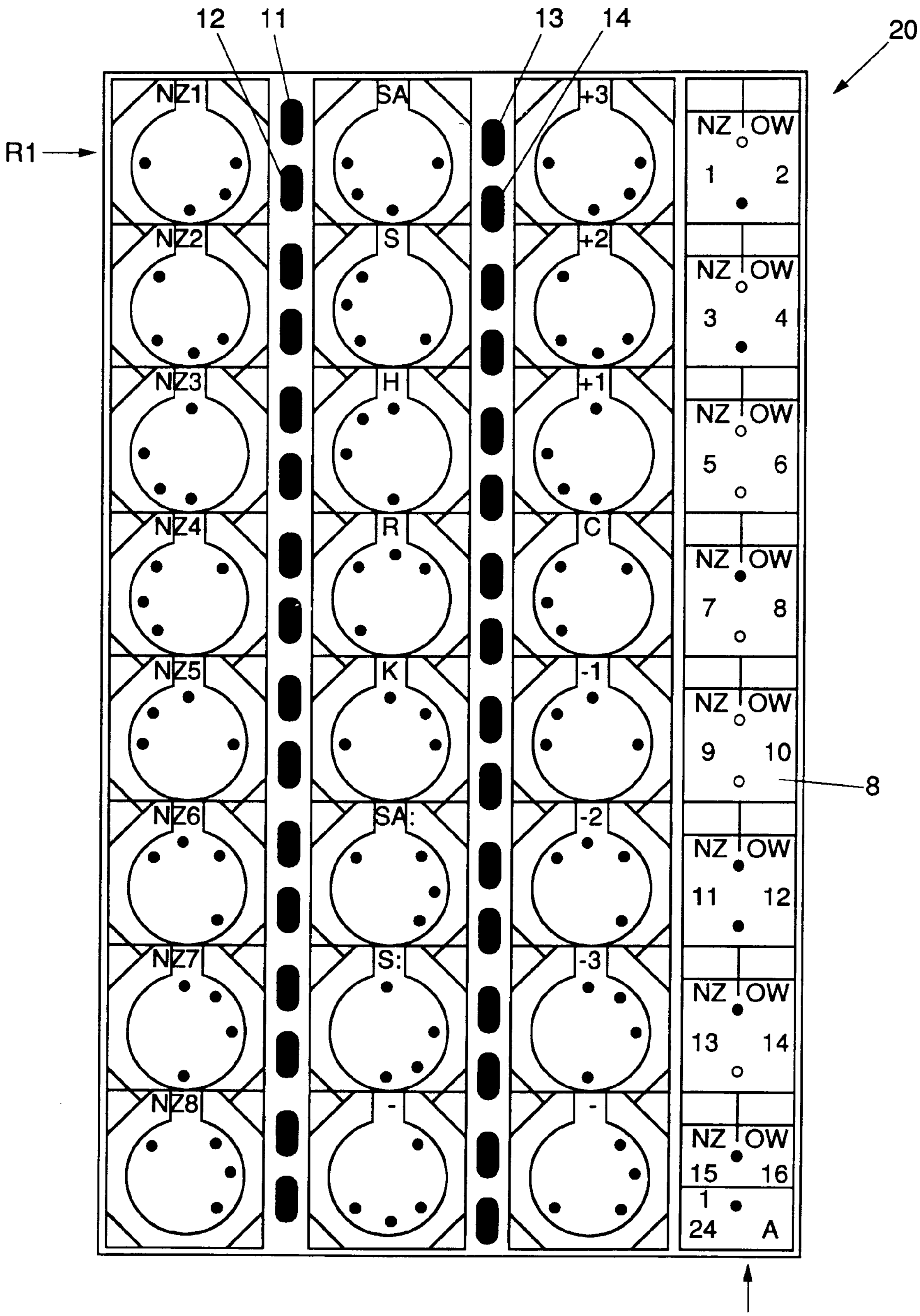

12
11
13
14
20
R1
NZ1
SA
+3
NZ2
S
+2
NZ3
H
+1
NZ4
R
C
NZ5
K
-1
NZ6
SA:
-2
NZ7
S:
-3
NZ8
-
-
NZ OW
1 2
NZ OW
3 4
NZ OW
5 6
NZ OW
7 8
NZ OW
9 10
8
NZ OW
11 12
NZ OW
13 14
NZ OW
15 16
1
24 A
15

FIG. 4

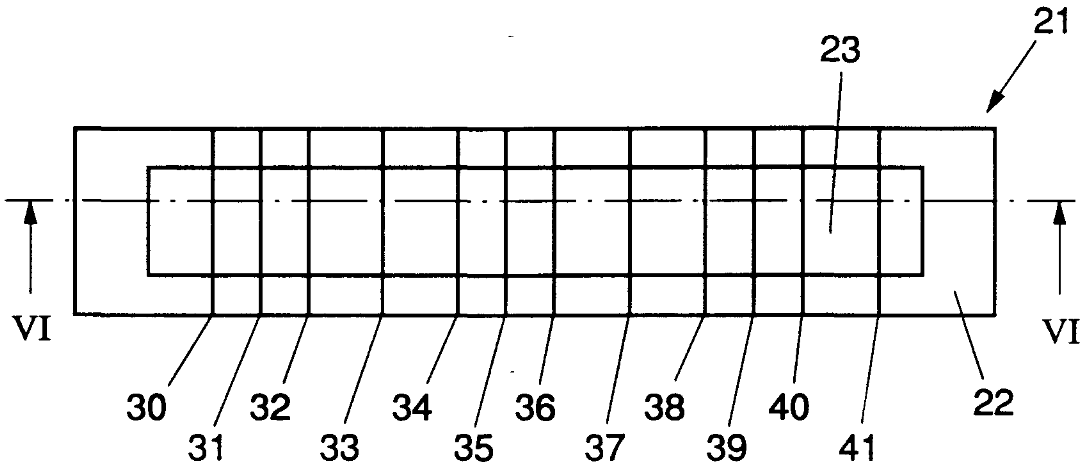
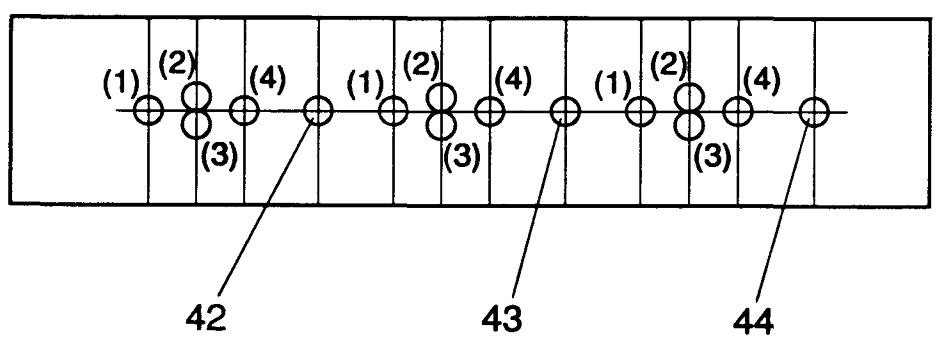

21
23
VI
VI
30
31
32
33
34
35
36
37
38
39
40
41
22

FIG. 5


(1)
(2)
(3)
(4)
(1)
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42
43
44

FIG. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 20 0896

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	US-A-4 900 027 (SHERIDAN) * claim 1 *	1,18	A63F1/18
A	FR-A-2 396 571 (LABORDE) * claim 1 *	1,18	
A	US-A-3 992 010 (MATTENSON) * column 1, line 54 - line 56 *	1,18	
A	EP-A-0 237 313 (HORN ABBOTT)	1,18	
A	US-A-4 227 318 (MIMS) * claim 1; figure 1 * * column 3, line 35 - line 52 *	1,18	
A	US-A-5 110 134 (LAUGHLIN ET AL) * column 3, line 23 - line 27 *	1,18	
A	US-A-4 534 562 (CUFF ET AL.) * column 3, line 31 - line 32; figure 1 *	1,18	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			A63F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21 July 1994	Glas, J

CATEGORY OF CITED DOCUMENTS

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