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ΕΥΡΕΣΙΤΕΧΝΙΑΣ  
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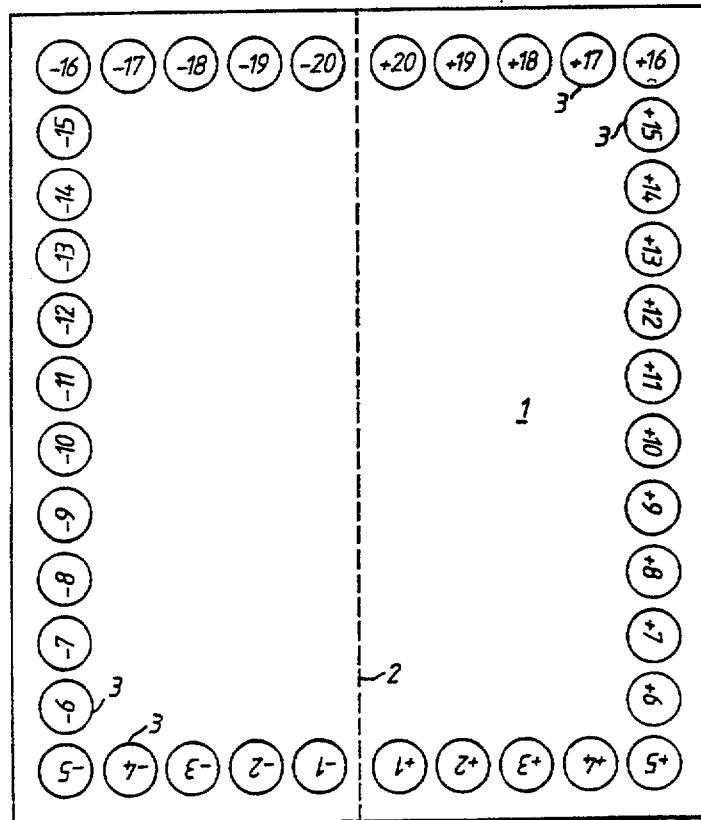
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**US 4092029 A US 3708169 A**  
**The game of "Goose"**

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(54) **Race game apparatus**

(57) A game board 1 is marked with twenty positions 3 showing the numbers +1 to +20 and -1 to -20, respectively. The apparatus also includes two cuboid dice (not shown) marked on their six sides with the values +1 to +6 and -1 to -6 respectively. In the game the two dice are thrown and summed and the results transferred to the movement of a marker on the board. The apparatus is useful in teaching the mental summing of positive and negative values to young children and others requiring such instruction and has the considerable advantage that, for example, when used as a game by two young children, they compete against each other to make simple calculations quickly and correctly rather than being checked by any supervising adult. In a modification, the board can be replaced by a stepped pyramid, each step corresponding to a number.



**FIG. 1.**

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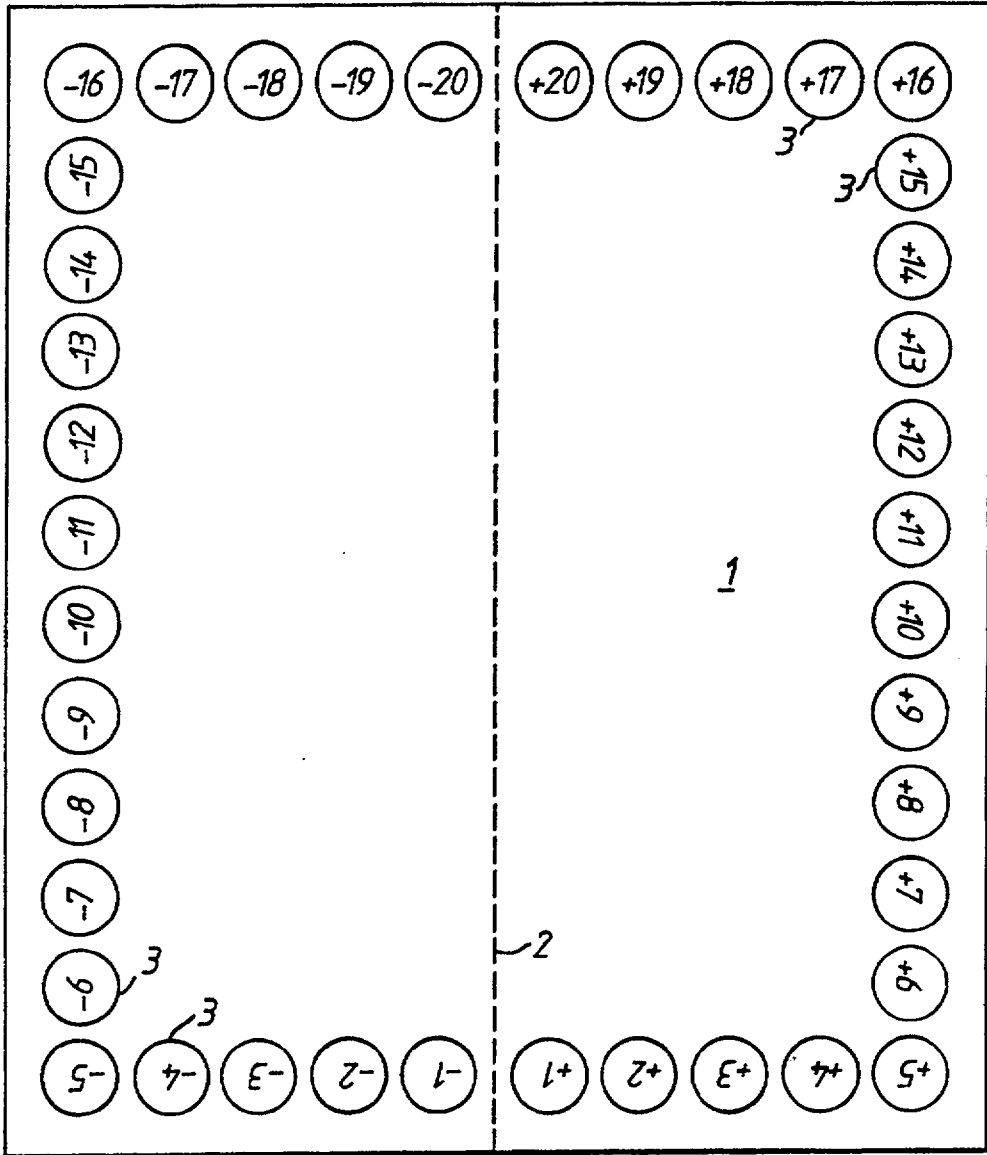


FIG. 1.

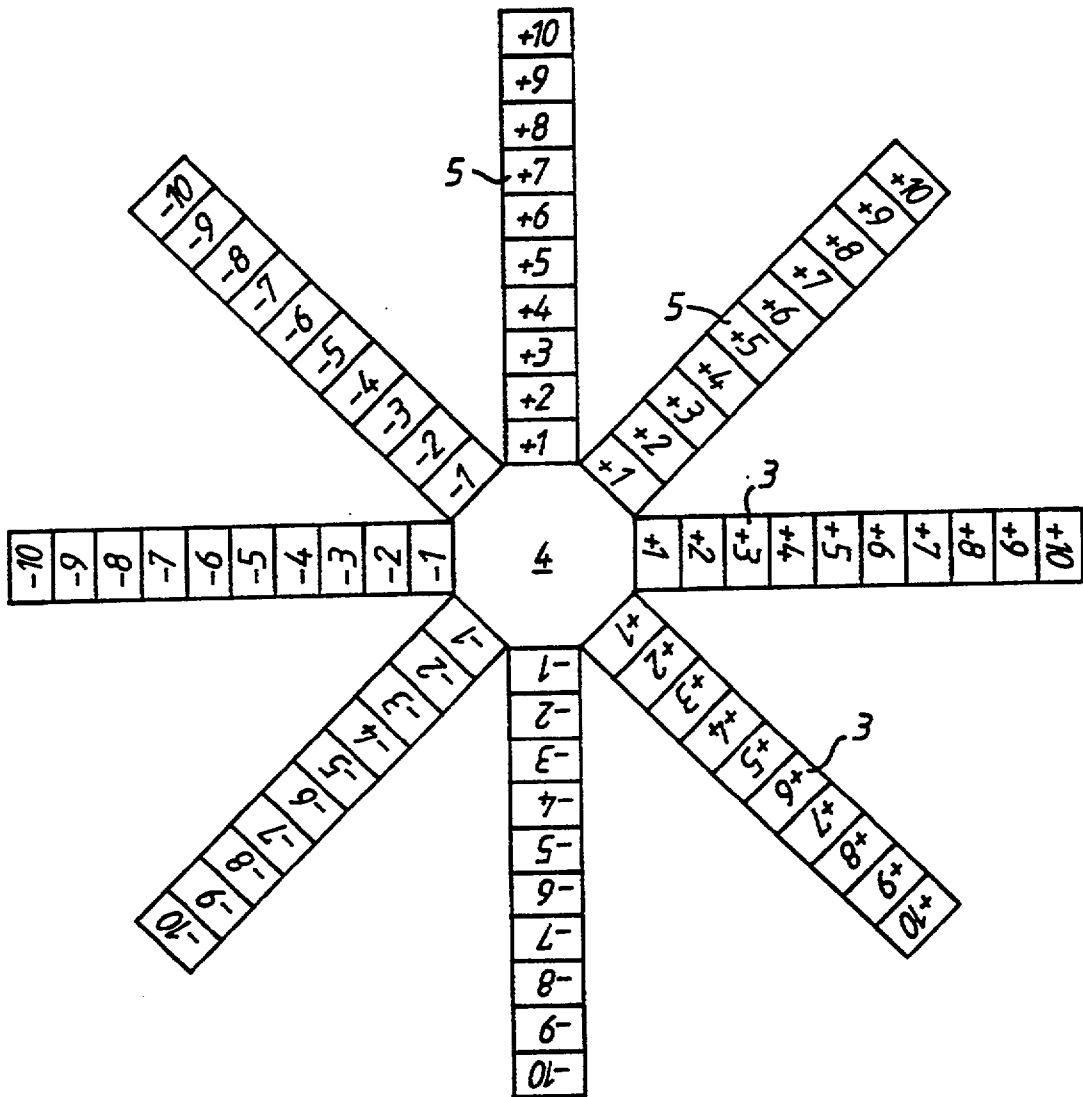


FIG. 2.

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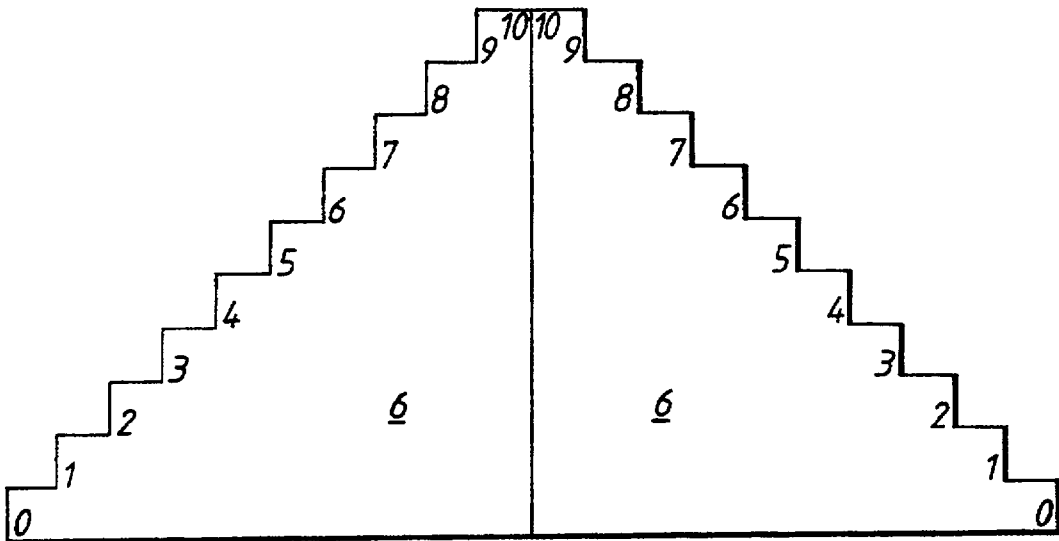


FIG. 3.

CALCULATING APPARATUS

This invention relates to calculating apparatus which may function as a toy, a game or for teaching various mathematical techniques. In fact, calculating apparatus in accordance with the invention may simultaneously fulfil two or all three of these functions. For example, apparatus in accordance with the invention may be employed to teach young students how to add and subtract positive and negative numbers in an interesting manner that will cause them to learn the techniques involved without necessarily realising that they are doing so and thus, in many cases, without exerting the resistance to learning that is very often encountered when young children are taught how to employ basic calculation techniques in traditional ways. Apparatus in accordance with the invention may be in the form of a game that can be played by at least two persons, the apparatus simulating a double staircase or the like or being in the form of a marked board, either version of the apparatus including hexagonal or other dice or the like marked in a manner particular to this apparatus and playing pieces or "men".

According to the invention, there is provided calculating apparatus comprising means to display positive and negative values, playing pieces disposable at positions on said display means which will indicate corresponding values, and means by which positive and negative values within a range can be randomly displayed.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figure 1 is a plan view illustrating a board of apparatus in accordance with one embodiment of the invention,

Figure 2 illustrates an alternative construction

of the part of the apparatus that is shown in Figure 1, and

Figure 3 illustrates a further alternative construction of "double staircase" configuration.

Referring firstly to Figure 1 of the drawings, that figure illustrates a board 1 that is foldable about a line 2 extending mid-way between, and parallel to, both of the longer opposite edges of the oblong board 1. Forty positions 3 are marked around the edges of the board 1, 20 of them at one side of the fold line 2 showing the numbers +1 to +20, respectively, and those at the opposite side of the fold line 2 showing the numbers -1 to -20, respectively.

A game which may be played employing the calculating apparatus that includes the board 1 of Figure 1 of the drawings is for two players and also includes two playing pieces or "men" (not shown) that may be of any desired form whatsoever provided only that they are visually distinct from one another by way of shape and/or colour and/or size and/or in any other convenient way. Also included in the apparatus are, preferably, two dice of conventional cube shape, one of them being marked on its six sides with the values +1 to +6, respectively, and the other one being marked on its six sides with the values -1 to -6, respectively. Dice of other forms could, if preferred, be substituted. For example, dice each having only four triangular surfaces could be employed or dice of octahedral form showing positive and negative numbers on their eight sides. Other possibilities include employing so-called "spinners" each comprising a regular polygonal disc that can be spun, in the manner of a "spinning top", around a central shaft extending perpendicular to the plane of the disc through its centre point. Each edge of such a disc is marked with an appropriate value and, when the disc is spun about its central shaft, it will eventually come to rest on that shaft and one of the edges, the edge in question

being the value to be used at that time by the corresponding player. Still another possibility is to use small packs of cards, similar to conventional playing cards, the backs of all of the cards in a "positive" pack being identical and the backs of the cards in a "negative" pack being identical to one another but different to those of the "positive" pack. The faces of the cards in the two packs would be inscribed with appropriate positive and negative numbers and each pack could contain a sufficient quantity of cards, with number repeats, to prevent a sharp-eyed player from being able to follow any one particular card during a shuffle of the pack which might be possible if there were, for example, only six cards in each pack.

When two players are playing a game employing the board of Figure 1 of the drawings with any desired playing pieces and two dice of cube form as described above, the first player shakes and throws both dice and if, for example, one of them shows +5 and the other shows -2, the player calculates in his/her head the sum of those values which is +3 and he/she then puts his/her playing piece on the position 3 marked +3 on the board 1. The dice and the board 1 are, of course, fully visible to the other player who can thus make the same mental calculation and challenge the first player if he/she gets their calculation wrong.

The second player follows and might, for example, have to make a calculation whose result is -4. The second player then puts his/her playing piece at the position 3 which is marked with the value -4, the first player checking the calculation and challenging if the second player has got it wrong. The first player throws the dice again and might, for example, obtain the value -2 as the sum of the positive and negative numbers shown on the upwardly facing sides of the two dice. The first player has then to make a second calculation subtracting 2 from the value +3 where his/her playing piece is

positioned so that +1 results and his/her playing piece is transferred to the position 3 which shows the value +1. Once again, the second player checks these calculations and will complain if an error is made.

The game is continued until one of the two players, after throwing both dice, summing the values shown on their upper surfaces and summing the resultant value with the one shown on the position 3 occupied by that player's playing piece, obtains a final total which is greater than +20. The player in question is then the winner. Additionally, or alternatively, the player who first achieves a total of less than -20 may automatically be the loser, thus automatically making the other player the winner whatever his/her total is at that time.

If, because of the length of time any particular game is taking, a game has to be abandoned, the player with the greatest total at the time of abandonment may be considered to be the winner, considering -20 as the lowest allowable total and +20 as the highest allowable total. If desired, successive games may last for predetermined periods of time each of which may be indicated accurately by an alarm clock, watch or other timepiece or somewhat less exactly by visual inspection of a timepiece without using any form of alarm. It is emphasised that the particular numbers shown in Figure 1 of the drawings, and their arrangement, is purely by way of example. The numbers could be all positive or all negative and could have different ranges to those described with reference to Figure 1. In addition, there could be less, or more, of the positions 3, it immediately being obvious from Figure 1 that a central region of the board 1 at both sides of the fold line 2 could contain a greatly increased number of the positions 3. With such an arrangement, dice in the form of solid bodies having more than six sides could advantageously be employed provided that the shape of each die is such

that, after being rolled, it will come to rest on any one of its flat surfaces with an opposite flat surface disposed horizontally and facing upwards. The flat surfaces of such dice will carry numbers that reflect the increased possibilities for calculation that are given by increasing the numbers of positions 3 at each side of the fold line 2 which show various positive and negative totals as described with reference to Figure 1 of the drawings or as arranged in one of the alternative ways briefly discussed above.

A further alternative is possible to what has already been described and that is illustrated in Figure 1. According to this further alternative, two rows of respectively positive and negative numbers are provided for each player, the positive numbers all being at one side of the board which may be considered as being the positive side thereof whilst the negative numbers are all at the other or negative side. It is thus not necessary for each marked number to be preceded by either "+" or "-" but, if desired, contrasting colours may accompany each number. Purely for example, green may indicate the positive numbers and red the negative ones. The use of contrasting colours to denote positive and negative may also be used, <sup>as</sup> an alternative, or in addition to, the employment of the signs "+" and "-" in the other embodiments that have been described and in those that will be described below.

Figure 2 of the drawings shows an arrangement which is basically similar to that of Figure 1 except that there are four rows of numbers each extending from -10 to +10, the four rows intersecting at a central blank octagon 4. Calculating apparatus in accordance with such an embodiment of the invention could comprise markings on a foldable or other board or eight synthetic plastics, wooden or other strips 5 each releasably connectable at one end to a facing flat surface or edge of the central

blank octagon 4. Up to four different players, each provided with a corresponding playing piece, could play a game employing the apparatus that is shown in Figure 2 of the drawings and it will readily be apparent that other arrangements basically similar to those that have already been described above could be employed in relation to apparatus that is generally similar to that of Figure 2 of the drawings. It is not, for example, essential that each marked strip or the like 5 should be of rectilinear configuration. The strips 5 could, for example, each be of curved configuration so that the total area occupied by the apparatus on a table or other flat surface could be reduced as compared with the arrangement shown in Figure 2 whilst retaining the same, or even an increased, number of the positions 3.

Figure 3 of the drawings illustrates calculating apparatus in accordance with the invention which comprises two opposed staircase-formation units 6 that may be moulded from a synthetic plastics material or be produced from wood, paperboard or the like. The two units 6 are used, as illustrated, symmetrically alongside one another or could, if preferred, be formed integrally as a single entity. The lowest level which corresponds to the bases of the two units 6 that stand upon a table or other flat surface is given the value 0/0 and there are ten horizontal steps located one after the other above that lowermost level, each such step being marked with a corresponding value from 1 to 10, respectively. Each player has a playing piece or "man" that will stand in a reasonably stable state on any appropriate one of the ten steps and the winner of a game played by two participants is the player whose piece first reaches the uppermost step or level "10". The game is started with each player having his/her playing piece at the lowermost 0/0 level and a pair of dice as previously described, respectively marked with positive and negative values, is employed, each player having to make a calculation at

each turn to decide the appropriate step upon which his/her playing piece is to be placed. With this arrangement, any starting or subsequent turn which would theoretically place the corresponding playing piece on a step having a negative value of less than 0/0, is disregarded and the playing piece in question merely remains at, or is returned to, the 0/0 level. The embodiment of Figure 3 of the drawings is considered to be particularly appropriate for teaching numeracy and simple addition and subtraction to young children either at home or during their first few weeks at school. If desired, instead of moving the playing pieces (not shown) to the required steps or levels on the units 6, a simple mechanical arrangement may be provided to move them upwardly or downwardly from step to step on the two units 6.

It will immediately be apparent that apparatus in accordance with the invention could be furnished in a number of different ways and that it could be employed to introduce young children or others requiring numerical education to hundreds, thousands, tens of thousands, hundreds of thousands, millions and so on and also to metric or other fractions of unity. The dice (not shown) that are employed could, in more sophisticated versions for use by persons already having a considerable degree of numerical knowledge, carry on appropriate surfaces simple instructions such as, for example, "multiply by 2" ( $\times 2$ ), "divide by 2" ( $\div 2$ ) and so on, the possibilities for sophisticated versions of the apparatus being far too great to list and it being emphasised that the simple possibilities that have just been mentioned are purely by way of example only.

Apparatus in accordance with the invention can provide a very useful aid to teaching simple calculations to, in particular, young children who will be urged to do their calculations correctly not by the desire to please the supervising adult or adults but more by wanting

strongly not to be "caught out" in an incorrect calculation by the one or more contemporaries in age with whom they are playing a game. Thus, the capability mentally to make relatively simple numerical calculations quickly and accurately will very soon be acquired and, in most cases, will be retained for life.

CLAIMS

1. Calculating apparatus comprising means to display positive and negative values, playing pieces disposable at positions on said display means which will indicate corresponding values, and means by which positive and negative values within a range can be randomly displayed.
2. Apparatus according to Claim 1, wherein at least the means by which positive and negative values within a range can be randomly displayed can also display the value zero.
3. Apparatus according to Claim 1 or 2, wherein the means to display positive and negative values is in the form of a board.
4. Apparatus according to Claim 3, wherein the board is foldable.
5. Apparatus according to any preceding claim, wherein each displayed positive and negative value is accompanied by the corresponding mathematical sign "+" or "-".
6. Apparatus according to any one of claims 1 to 4, wherein each positive and negative value is denoted by a corresponding contrasting colour.
7. Apparatus according to any preceding claim, wherein said means by which positive and negative values within a range can be randomly displayed, comprises two cuboid dice.
8. Apparatus according to Claim 1 or 2, wherein the means to display positive and negative values comprises two opposed staircase - formation units, each step therein being marked with a corresponding value.
9. Apparatus according to any preceding claim, wherein the displayed positive and negative values are, or include, +1 to +10 and -1 to -10.
10. Calculating apparatus substantially as hereinbefore described with or without reference to any of the embodiments that are illustrated in the accompanying drawings.