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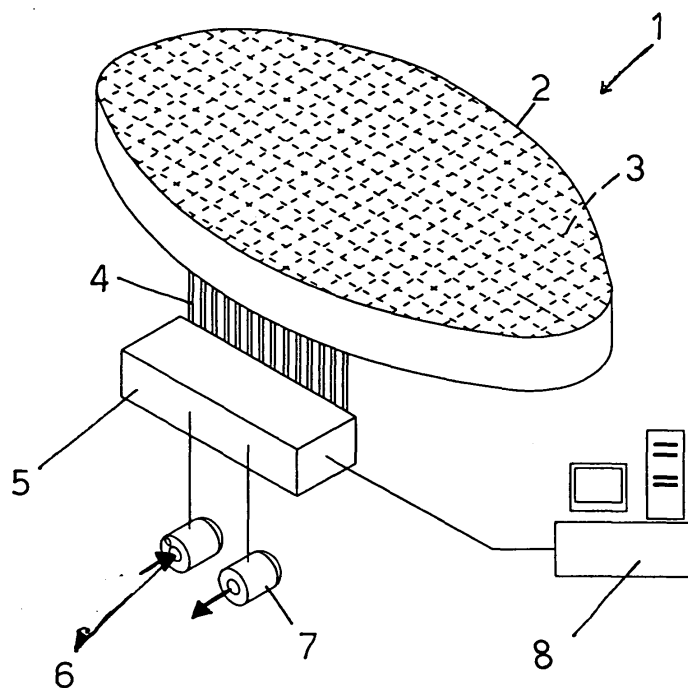
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(54) **A variable morphology putting green for playing golf**

(57) A variable morphology putting green (1) comprises a covering element (2) and means for varying the height or level of the covering element with respect to a base therefor, said means comprising a plurality of cushion elements (3) designed for operating between a completely full condition and a completely empty condition, and which can be filled-in by a filling-in fluid.

With respect to prior putting greens, the inventive putting green has the advantage that it is very simple, owing to the provision of inflatable cushion elements, or cushion elements designed to be filled by highly pressurising fluids. Moreover, the arrangement of the filling-in means for filling the cushion elements outside the body of the putting green greatly facilitates maintenance operations of said cushion elements.



**FIG 1**

## Description

### BACKGROUND OF THE INVENTION

[0001] The present invention relates to a novel variable morphology putting green, specifically designed for playing golf.

[0002] The field of the invention is that of the variable morphology putting greens simulating, in an artificial manner, different experiences in putting operations on playing golf.

[0003] To that end are already known computer system controlled putting greens, which are so controlled to modify their morphology or pattern, starting from mechanical systems (usually cylinder and piston mechanisms), which prior systems have the disadvantage that they are very complex and require a difficult and expensive maintenance.

### SUMMARY OF THE INVENTION

[0004] Thus, the aim of the present invention is to provide such a variable morphology putting green which is much more simple than like prior putting green systems, and which, moreover, can be recovered in a very simple and easy manner in a failure event.

[0005] According to one aspect of the invention, the above aim, as well as yet other objects, which will become more apparent hereinafter, are achieved by a putting green as claimed in claim 1.

[0006] Preferred embodiments of the invention are defined in the remaining claims.

[0007] With respect to prior putting greens, the inventive putting green provides the advantage that it is much more simple, owing to the provision of the plurality of inflatable cushion elements, or cushion elements adapted to be filled by highly pressurized fluids.

[0008] Moreover, the arrangement of the filling means of the cushion elements outside of the putting green body greatly facilitates the maintenance operations on said cushion elements.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The above mentioned aim and yet other objects, advantages and features will become more apparent hereinafter from the following detailed disclosure of a preferred embodiment of the invention, which is illustrated, by way of a non limitative example, in the accompanying drawings, where:

Figure 1 is a schematic view showing the putting green according to the present invention, including related control systems for controlling the morphology or pattern of said putting green;

Figure 2 shows a schematic diagram of a pressurizing-depressurizing system of a variable morphology putting green unit;

Figure 3 shows a detail of a control system for filling-in a cushion element of the unit shown in figure 2; Figure 4 shows a modified embodiment of the unit shown in figure 2; and

Figure 5 is a cross sectional view showing an example of a putting green made according to the present invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0010] The putting green according to the invention has been generally indicated by the reference number 1 in figure 1.

[0011] Said putting green comprises a covering element 2 thereunder a plurality of cushion elements 3, made of a flexible and strong material, are arranged.

[0012] Said cushion elements are filled by a pressurized fluid (such as air or a liquid as water) which is supplied by a tube system 4 each tube of said system being controlled by respective controlling valves 9 assembled on a delivery block 5 for delivering the cushion element 3 filling-in fluid.

[0013] Moreover, each said valve 9 is operatively respectively coupled to a compressor 6 and a de-compressor 7, communicating through said valve 9, and accordingly with the respective cushion element 3, through a respective duct 4.

[0014] In particular, the cushion element 3 filling-emptying system is controlled by a PCL 8, designed for adjusting the opening/closing movements of the valves 9 of each said cushion element, thereby easily modifying the morphology of the putting green 1 depending on the player requirements.

[0015] As stated, the fluid medium for filling-in the individual cushion elements 3 can comprise either a gas (preferably air) or a liquid (for example water).

[0016] Said cushion elements are made of a flexible material, adapted to switch from a fully compressed position (an empty cushion condition) to a completely filled or full condition (a full cushion condition) and vice versa.

[0017] Preferably, the putting green 1 comprises a plurality of putting green units 10, each said unit being formed by a corresponding plurality of cushion elements 3 (figure 2).

[0018] According to a modified embodiment of the invention shown in figure 4, the putting green 1 comprises a plurality of cushion elements forming a composite layered putting green unit 11, in turn formed by a cushion element 12 of a large size, thereabove one or more cushion element 3 unit 10 are arranged.

[0019] In the embodiment shown in figure 5, the putting green 1 comprises a covering element 2 thereunder are arranged, in the following order: a base 13 including a plurality of channel elements 14 for allowing tubes 4 to pass therethrough; large cushion elements 12 filled-in either by air or water; and top overlapped cushion element 3 layers, in a full cushion element 3a and empty

cushion element 3b status.

## Claims

1. A variable morphology putting green, including a covering element and means for varying a level or height of said covering element with respect to a base therefor, **characterized in that** said means comprise a plurality of cushion elements designed for operating between a completely full condition and a completely empty condition, said cushion elements being filled-in by a filling-in fluid.

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2. A putting green according to claim 1, **characterized in that** said filling-in fluid comprises a gas, preferably air, or a liquid, preferably water.

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3. A putting green according to claim 1, **characterized in that** said putting green comprises moreover a compressor and a de-compressor for filling-in/emptying each said cushion element by said filling-in fluid.

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4. A putting green according to claim 3, **characterized in that** said putting green comprises moreover a valve system including a plurality of valves each of which is associated to a fluid delivery block, each said valve being controlled by a computer system controlling a selective filling-in/emptying of said cushion elements depending on a morphology or pattern desired therefor.

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5. A putting green according to claim 1, **characterized in that** said cushion elements are assembled to provide a cushion element unit for controlling said level or height of said covering element.

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6. A putting green according to claim 2, **characterized in that** said cushion elements are so assembled as to provide a composite layered unit including a large size cushion element thereabove one or more of said cushion element units are arranged.

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7. A putting green according to claim 1, **characterized in that** said base comprises a plurality of channels for holding corresponding ducts therein.

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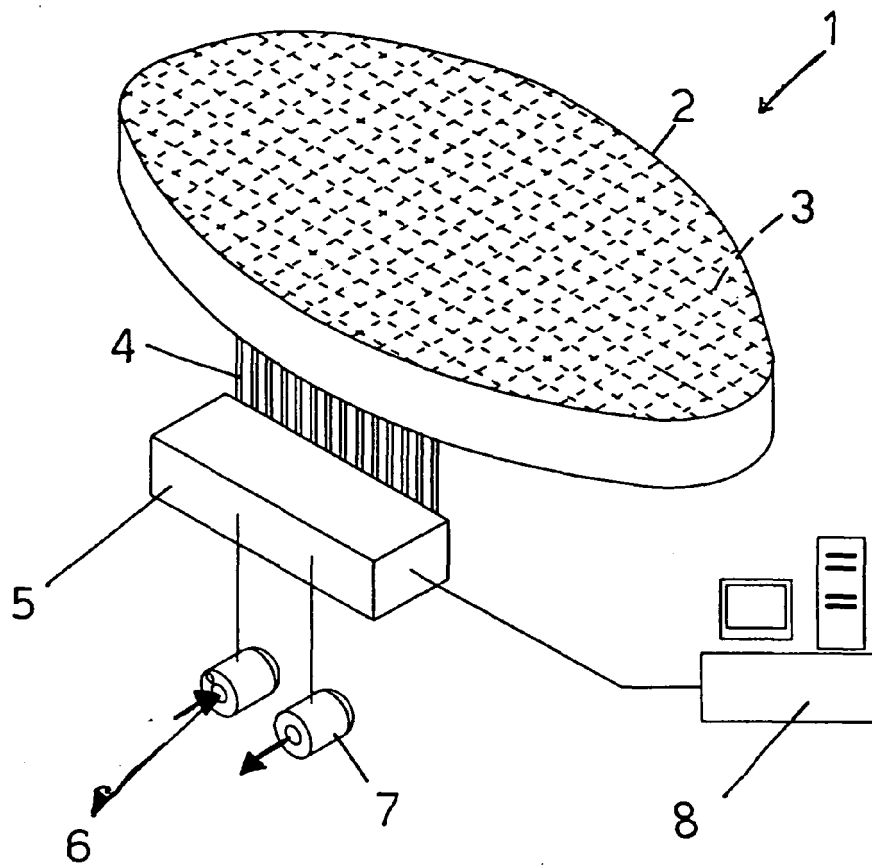


FIG 1

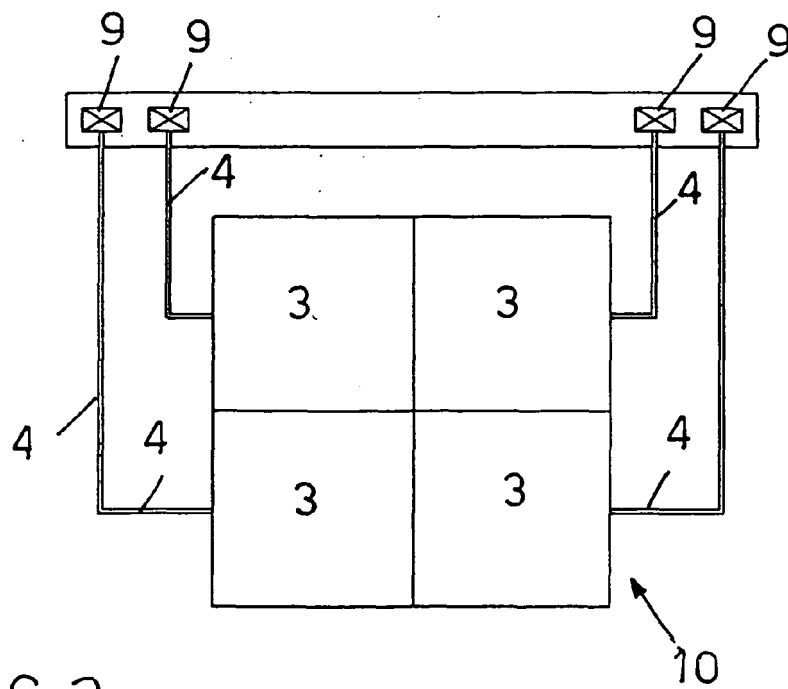


FIG 2

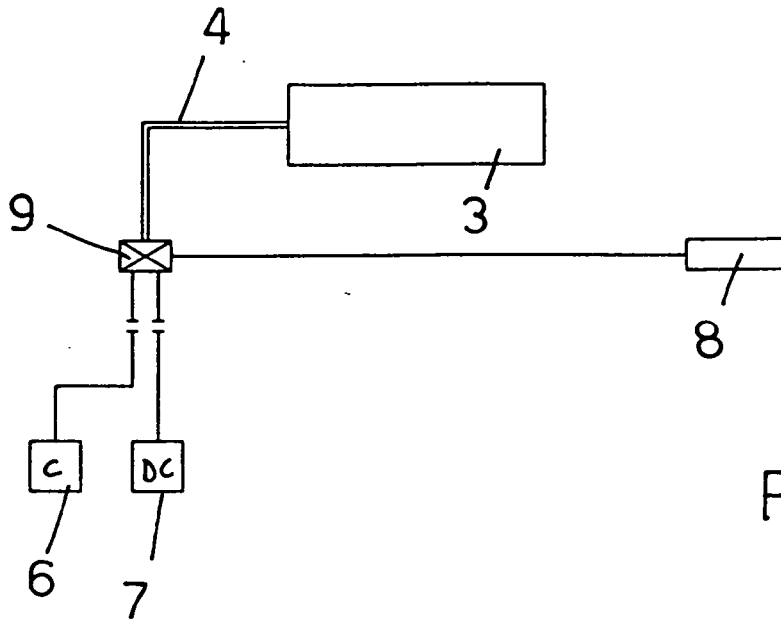


FIG 3

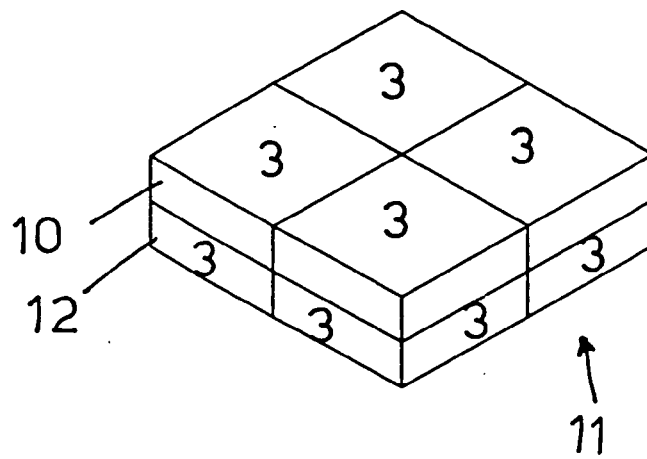


FIG 4

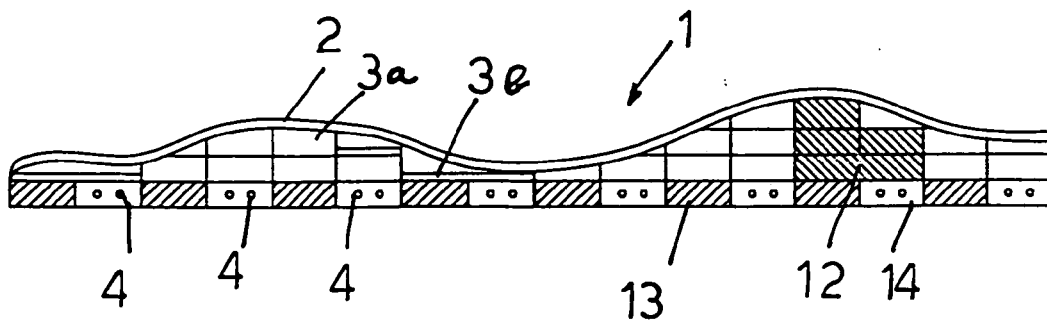


FIG 5



## EUROPEAN SEARCH REPORT

Application Number  
EP 08 01 9465

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 00/62863 A (GOLF N TECH) 26 October 2000 (2000-10-26) * page 8, line 7 - page 17, line 11 * * page 22, line 7 - page 29, line 12; figures 1-9 *	1-7	INV. A63B67/02 A63B69/36
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X	US 6 056 645 A (SERVATIUS) 2 May 2000 (2000-05-02) * column 2, line 39 - column 3, line 16; figures 1,2 *	1-5,7	
X	WO 99/19032 A (SKONE ET AL.) 22 April 1999 (1999-04-22) * page 5, paragraph 1 - page 6, last paragraph; figures 1,2 *	1-5,7	
X	US 3 690 673 A (OCCHIPINTI) 12 September 1972 (1972-09-12) * the whole document *	1-3,5	TECHNICAL FIELDS SEARCHED (IPC) A63B
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 February 2009	Examiner Williams, Mark
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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