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(54) Recreational surfaces

(57) There is disclosed a recreational surface (10) disposed on a sub-base (12) and comprising a mould (14) filled with a resilient composition so as to provide an impact absorbing upper surface, in which the mould (14) is configured so as to leave void areas (20) underneath the upper surface (18) which are not filled by resilient composition.

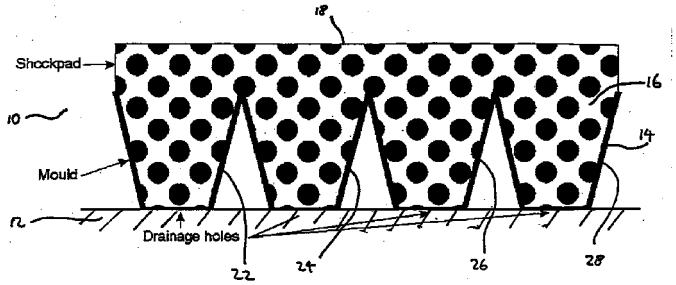

Fig.1

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Description

[0001] This invention relates to impact absorbing recreational surfaces such as surfaces suitable for sports or as children's play areas, and methods for making them.

[0002] Known such impact absorbing surfaces comprise particles of natural or synthetic rubber, such as SBR or EPDM for example, in a matrix of polymeric binder, such as polyurethane. The particles typically comprise granules or shreds of rubber.

[0003] The matrix may completely fill the spaces between the particles to give a non-porous composition, or simply coat the surfaces of the particles to cause them to adhere leaving the interstices between the particles void to give a porous product.

[0004] Either kind of composition may be laid on a sub-base to form a sports or play surface or to form a substrate for another surface such as that provided by synthetic turf.

[0005] The present invention provides improved impact absorbing recreational surfaces which are cheap to produce and exhibit improved resilience characteristics.

[0006] According to a first aspect of the invention there is provided a recreational surface disposed on a sub-base and comprising a mould filled with a resilient composition so as to provide an impact absorbing upper surface, in which the mould is configured so as to leave void areas underneath the upper surface which are not filled by resilient composition.

[0007] The mould may comprise a plurality of mould cells. The cross sectional area of the bottom of a mould cell may be less than the cross sectional area of the top the mould cell. The mould cells may taper from top to bottom. The mould cells may be substantially frusto-pyramidal or frusto-conical.

[0008] The mould may comprise a matrix containing rows and columns of mould cells.

[0009] The bottom of the mould may be apertured. This improves drainage and permits connection of the surface to the sub-base. If the mould comprises mould cells, the bottoms of the mould cells may be apertured.

[0010] The mould may be fabricated from a plastic.

[0011] The mould may be fabricated from paper.

[0012] The resilient composition may comprise particles of a resilient material contained in a binder matrix. The binder matrix may be a polymer such as polyurethane.

[0013] The particles may comprise rubber. According to a second aspect of the invention there is provided a method for making a recreational surface according to the first aspect of the invention comprising the steps of:

positioning a mould on a sub-base;

filling the mould with a composition which is settable to provide a resilient composition; and

allowing the composition to set to provide a resilient composition, the resilient composition being retained in the mould.

[0014] Recreational surfaces and methods for making same in accordance with the invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 is a cross sectional view of a recreational surface according to the invention;

Figure 2 is a plan view of a mould according to the invention.

[0015] Figure 1 shows a recreational surface (shown generally at 10) according to the invention disposed on a sub-base 12 and comprising a mould 14 filled with a resilient composition 16 so as to provide an impact absorbing upper surface 18, in which the mould is configured so as to leave void areas 20 underneath the upper surface 18 which are not filled by resilient composition.

[0016] Thus, a consequence of using moulds of the above described type is that there are "void" areas 20 underneath the upper surface 18. These regions are not filled with the resilient composition, which means that the amount of resilient composition required to install a recreational surface is reduced compared to prior art methods in which such void areas are absent. Furthermore, these cost savings do not result in any deterioration in the performance of the recreational surface. In fact, as described in more detail below, recreational surfaces having enhanced shock absorbing properties can be produced.

[0017] The mould 14 comprises a plurality of mould cells 22, 24, 26, 28 in which, as can be seen from Figure 1, the cross sectional area of the bottom of a mould cell is less than the cross sectional area of the top of the mould cell. The moulds cells taper from top to bottom, thereby providing void regions 20 between adjacent cells.

[0018] Figure 2 shows a plan view of a mould 30 comprising a matrix containing rows and columns of mould cells 32. The specific configuration of the mould cells 32 will now be described with reference to the mould cell 32 shown in the top-left position of the matrix of Figure 2. The top of this cell is defined by the sides 32a, 32b, 32c, 32d and the bottom of the cell is defined by the sides 32e, 32f, 32g, 32h. Thus, the top and bottom are rectangular in cross section, the cross sectional area of the bottom being less than the cross sectional area of the top. In other words, the cells are frusto-pyramidal.

[0019] An important advantage provided the use of such mould cells 32 is that they have advantageous compressibility properties. This has the effect that a recreational surface of the present invention can absorb

more energy than would a solid (but otherwise equivalent) recreational surface of the type well known in the prior art. It is believed that this is because the recreational surface is acting somewhat in the manner of a spring mattress, i.e., the shockpad portion of the surface is supported by a series of mould cell "legs", each of which is relatively compressible and springy.

[0020] It is possible to utilise other mould cell configurations, such as a square pyramidal frustrum, or a frusto-conical configuration, or, indeed, more complicated geometrical shapes.

[0021] As shown in Figure 2, the mould 30 conveniently comprises a matrix containing rows and columns of mould cells 32. The frusto-pyramidal mould cell configuration is particularly advantageous in such a matrix because in this arrangement the upper portion of the mould only comprises a series of edges (such as sides 32a, 32b, 32c, 32d) which are structurally stronger than, for example, a series of flat surfaces.

[0022] Advantageously, the bottom of the mould cells are apertured. This facilitates free draining and, where desired, connection of the recreational surface to the sub-base. As shown in Figure 1, the bottom of a mould cell 22, 24, 26, 28 might be completely open. Alternatively, a mould cell might comprise a flat bottom section with an aperture disposed therein.

[0023] Typical dimensions for a mould cell might comprise a cell width, length and depth of around 4 to 5cm, with a wall thickness of a few millimetres or even thinner. However, it is understood that these values are representative only, and that the skilled person would have no difficulty in selecting moulds of different dimensions that might be suitable for the desired application. The moulds may be fabricated from any suitable material, such as a plastic or a suitably stiff paper, or from compressed peat.

[0024] Recreational surfaces are prepared by positioning a mould on a suitable sub-base (substrate) and filling the mould with resilient composition. The resilient composition can be added to any desired level above the level of the mould. Methods suitable for accomplishing this are well known in the art, and will not be described in great detail here. Typically, the resilient composition comprises particles of a resilient material such as rubber contained in a binder matrix, usually a polymer such as polyurethane. After the mould is filled the polymer is allowed to cure.

[0025] The upper surface of cured resilient composition can be left exposed as, for example, in a children's playground. Alternatively, further layers may be added, such as carpet or turf.

Claims

1. A recreational surface disposed on a sub-base and comprising a mould filled with a resilient composition so as to provide an impact absorbing upper surface, in which the mould is configured so as to leave void areas underneath the upper surface which are not filled by resilient composition.

2. A recreational surface according to claim 1 wherein the mould comprises a plurality of mould cells.

3. A recreational surface according to claim 2 in which the cross sectional area of the bottom of a mould cell is less than the cross sectional area of the top of the mould cell.

4. A recreational surface according to claim 3 in which the mould cells taper from top to bottom.

5. A recreational surface according to claim 4 in which the mould cells are substantially frusto-pyramidal or frusto-conical.

6. A recreational surface according to any of claims 2 to 5 in which the mould comprises a matrix comprising areas containing rows and columns of mould cells.

7. A recreational surface according to any of the previous claims in which the bottom of the mould is apertured.

8. A recreational surface according to claim 5 when dependant on claim 2 in which the bottom of the mould cells are apertured.

9. A recreational surface according to any of the previous claims in which the mould is fabricated from a plastic.

10. A recreational surface according to any of claims 1 to 8 in which the mould is fabricated from paper.

11. A recreational surface according to any of the previous claims in which the resilient composition comprises particles of a resilient material contained in a binder matrix.

12. A recreational surface according to claim 11 in which the binder matrix is a polymer.

13. A recreational surface according to claim 12 in which the polymer is polyurethane.

14. A recreational surface according to any of claims 11 to 13 in which the particles comprise rubber.

15. A method for making a recreational surface according to any of claims 1 to 14 comprising the steps of:

    positioning a mould on a sub-base;

    filling the mould with a composition which is

settable to provide a resilient composition; and

allowing the composition to set to provide a resilient composition, the resilient composition being retained in the mould.

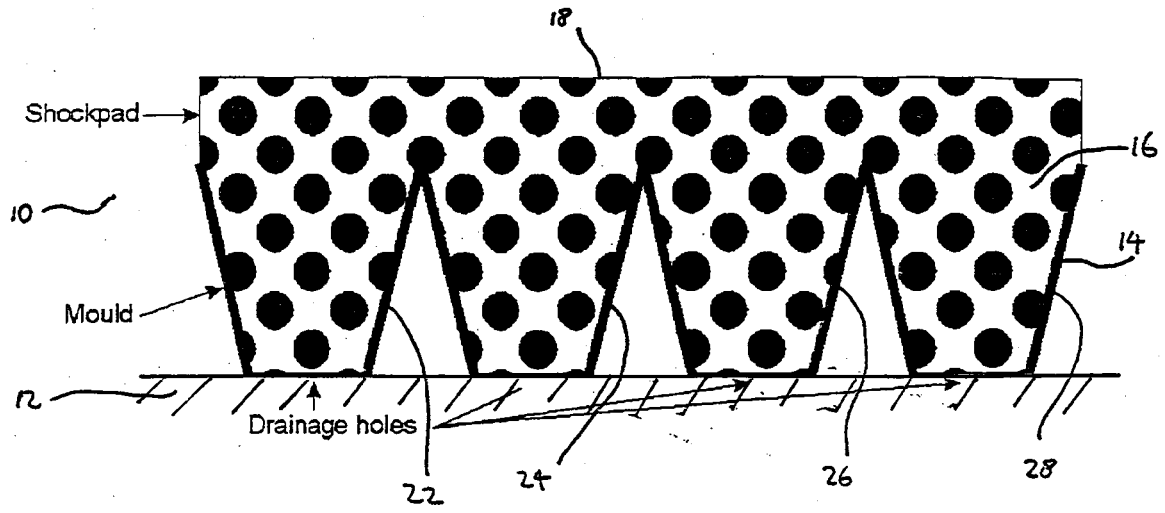
18
Shockpad
16
10
14
Mould
12
Drainage holes
22
24
26
28

Fig. 1

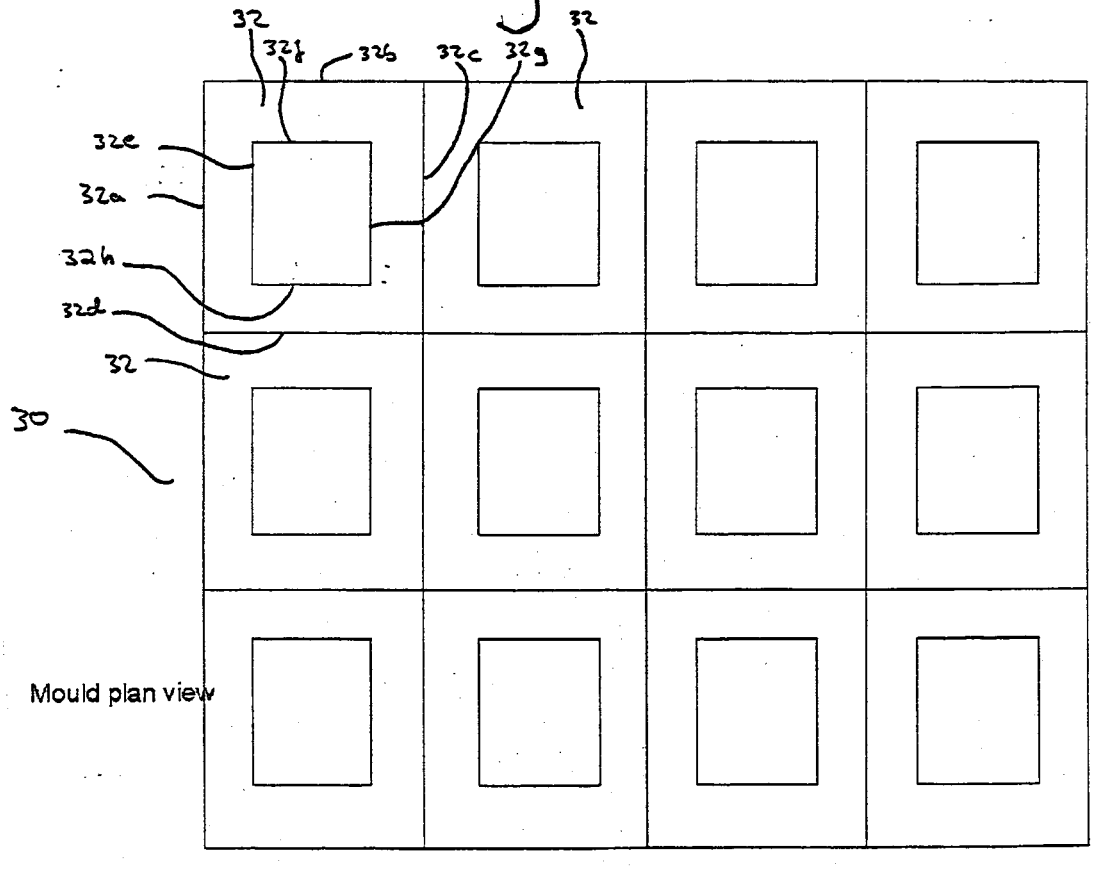
32
32f
32b
32c
32g
32
32e
32a
32h
32d
32
30
Mould plan view

Fig. 2