United States Patent

Blackburn

[15] **3,664,241**

[45] **May 23, 1972**

[54] METHODS FOR PRODUCING PAVEMENT-LIKE SITES

[72] Inventor: **Jack Blackburn,** 25 Springfield Hall Gardens, Huddersfield, England

[22] Filed: **Mar. 25, 1970**

[21] Appl. No.: **22,455**

[52] **U.S. Cl.** **94/10,** 94/4, 249/61

[51] **Int. Cl.** **E01c 7/10**

[58] **Field of Search** 249/61, 60, 118, 119, 129; 18/DIG. 12; 47/33; 94/2, 11, 13, 22, 24, 4

[56] **References Cited**

UNITED STATES PATENTS

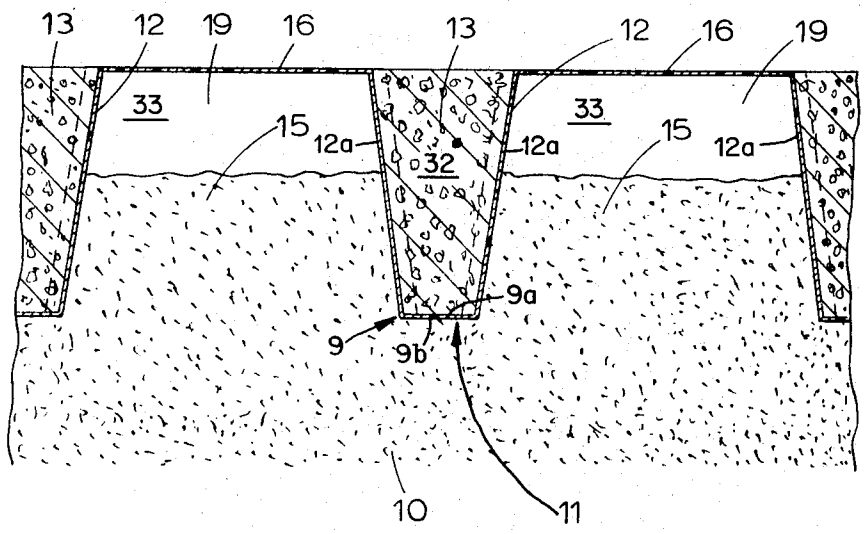
350,101	10/1886	Bates	47/33 UX
1,583,516	5/1926	Anfield	94/3 X
1,905,176	4/1933	Kieckhefer	47/33 UX
1,986,046	1/1935	Cross	47/33
2,101,019	12/1937	Bowes	249/61 X
2,899,775	8/1959	Partin	47/1
3,025,772	3/1962	Palatini	94/4
3,343,468	9/1967	Schraudenbach	94/11
3,421,417	1/1969	Pilaar	94/11

Primary Examiner—Jacob L. Nackenoff
Attorney—Watson, Cole, Grindle & Watson

[57] **ABSTRACT**

Methods of producing a pavement-like site composed of separate areas at least including concrete areas by laying fluid concrete, and by the use of formers to separate said areas. The site may be composed of areas of concrete and areas of natural or imitation grass, sand or gravel or the like or areas of different colored concrete and the formers may remain in the site or be removed therefrom at some stage during its construction.

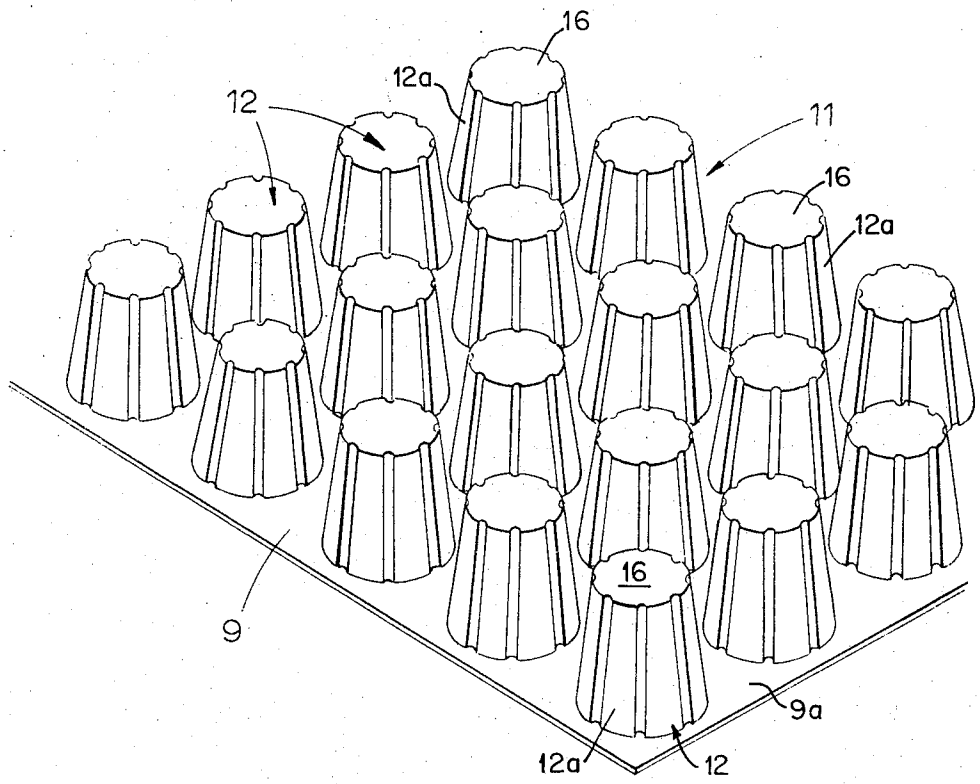
11 Claims, 7 Drawing Figures



Patented May 23, 1972 3,664,241

4 Sheets-Sheet 1

FIG. 1.



INVENTOR,
JACK BLACKBURN

BY
Watson, Cole, Grindle & Watson
ATTORNEYS

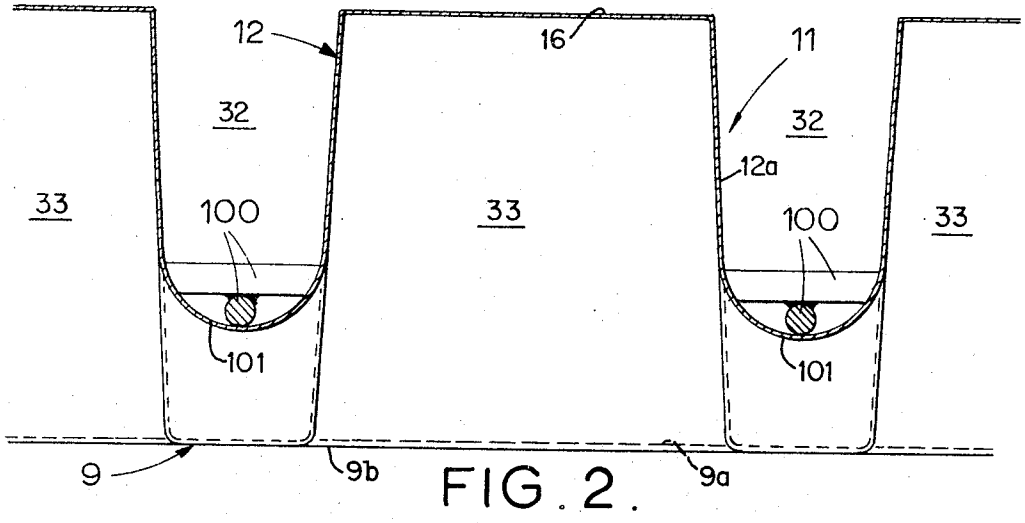


FIG. 2.

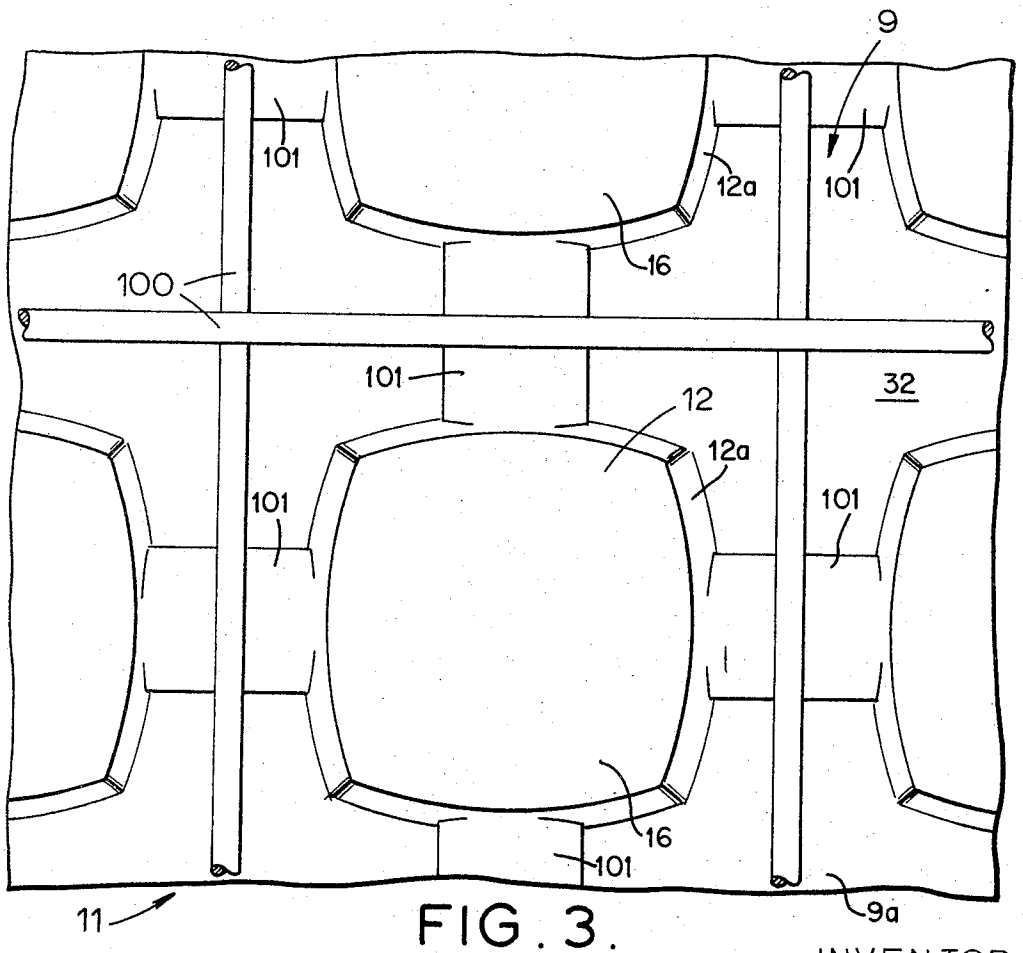


FIG. 3.

INVENTOR,
JACK BLACKBURN

BY
Watson, Cole, Grindle & Watson
ATTORNEYS

FIG. 4.

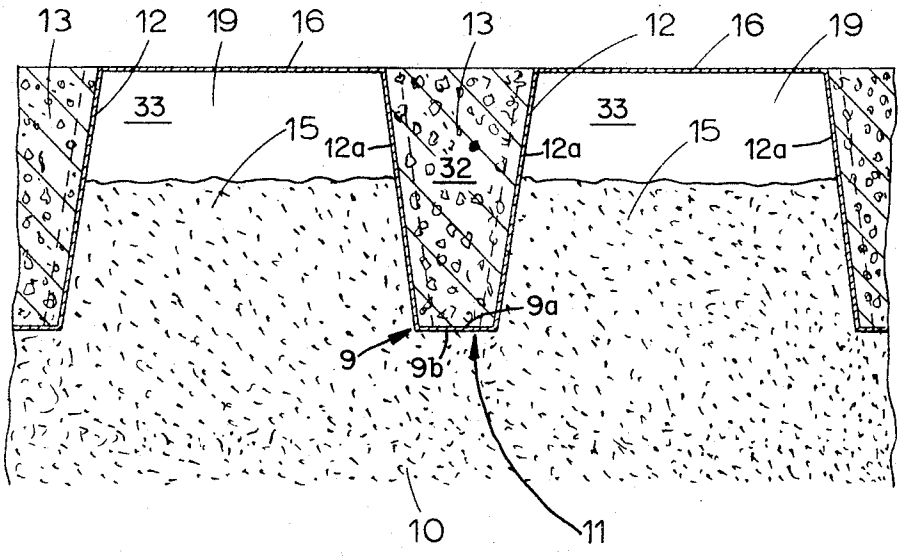
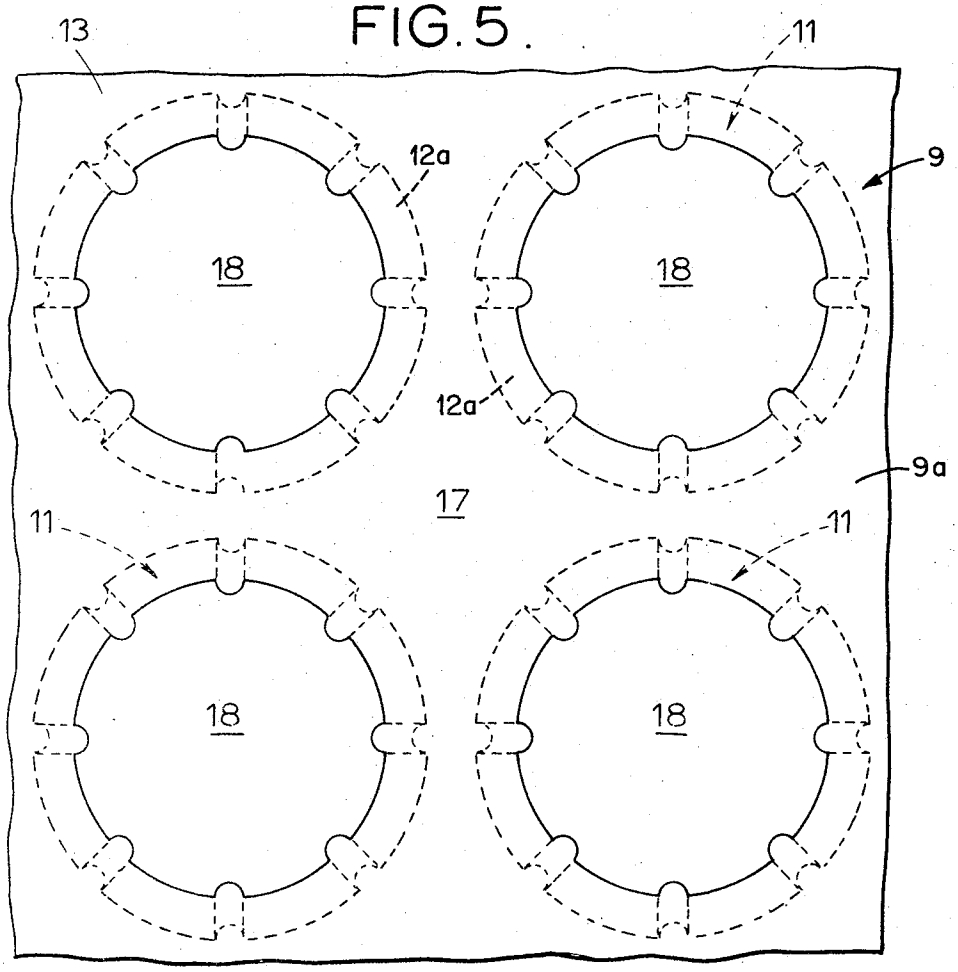


FIG. 5.



INVENTOR,
JACK BLACKBURN
BY Watson, Cole, Grindle & Watson
ATTORNEYS

FIG. 6.

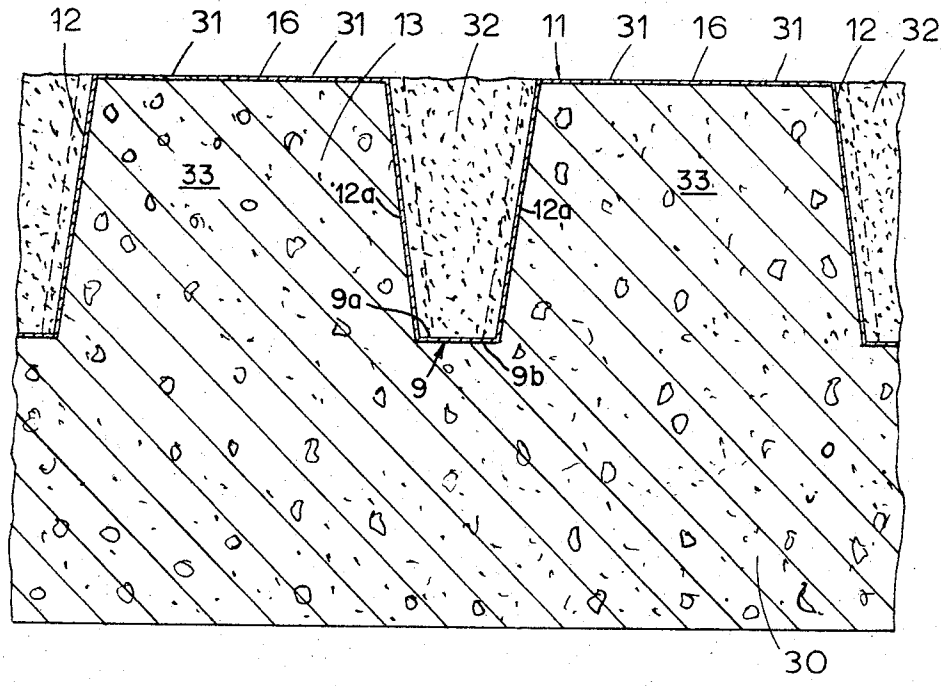
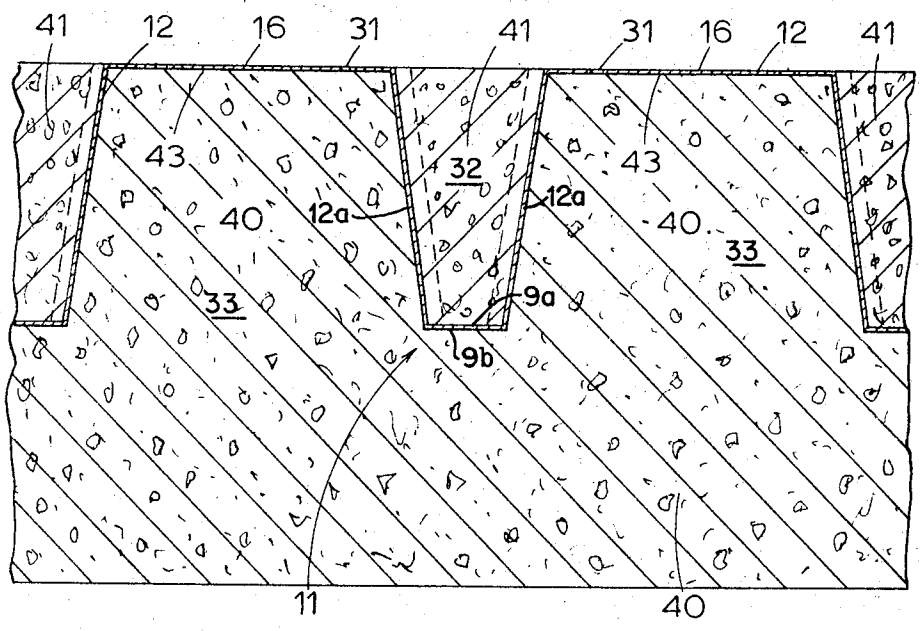


FIG. 7.



INVENTOR,
JACK BLACKBURN

BY
Watson, Cole, Grindle & Watson
ATTORNEYS

METHODS FOR PRODUCING PAVEMENT-LIKE SITES

BACKGROUND TO THE INVENTION

In order to produce a pavement-like concrete site which has a pleasing visual appearance it is known to use pre-cast concrete slabs. The use of such slabs is however limited and relatively expensive, and a firm base must be provided where strength is important. The present invention aims at producing a site by simply using fluid in situ concrete and gives rise to various novel and pleasing affects which hitherto have not been achieved.

SUMMARY OF THE INVENTION

According to the invention there is provided a method of producing a pavement-like site at least partially composed of concrete, said method being characterized by the use of a former adapted to separate areas of the site at least during its construction.

The former is, in accordance with this invention, composed of a series of upstanding peaks adjoined by a base surface and resembles an 'egg tray.'

In accordance with one aspect of the invention the former is placed onto soil seeded with grass and concrete is placed over the upper surface of the former.

The upper parts of the peaks of the former can be removed to allow the growth of the grass.

Turf divots or imitation grass can be used instead of seeded grass.

In accordance with another aspect a concrete base is initially laid, the former is impressed into said concrete base, and a soil and grass mixture is placed over the upper surface of the former.

Alternatively, the former can be removed when the concrete base has hardened and set. The set concrete can be covered with a mixture of grass seed and soil.

In accordance with the invention two or multicolored concrete sites can be produced. Thus in one method a concrete base is initially laid, the former is impressed into said concrete base, and a further concrete of different color is placed over the upper surface of the former.

In another method the undersurface of said former are treated with different color dyes, a concrete base is laid, the treated former is impressed into said concrete base and further concrete is laid over said former.

The term pavement-like sites is intended to include the following:

1. Children's play areas.
2. Large car parks,
3. Swimming bath surrounds — internal and external.
4. Esplanades.
5. Roof gardens and terraces.
6. Lawn car parks.
7. Garage drives.
8. Footpaths.
9. Motorway hard shoulders.
10. Forecourts.
11. Fire engine access to hospitals and other buildings.
12. Indoor bowling areas.
13. Race track mass parking areas.
14. Exhibition areas and showgrounds.
15. Self marking of parking areas.
16. Road verges.
17. Car race tracks.
18. Running tracks.
19. Caravan sites.
20. Municipal park areas.
21. Embankments.
22. Open air market places.
23. Sports ground surrounds contiguous with natural grass playing area.
24. Dirt track racing areas.
25. National park areas for amenities.
26. Fairground areas.
27. Internal courts.

28. Pedestrian ways and shopping precincts.
29. Air fields.
30. Cat's eyes for roading markings.

The grass and concrete site made in accordance with the invention combines the pleasing appearance and softness of grass with the strength of concrete.

A site can be quickly formed and the finished result is attractive in appearance yet it can stand up to heavy loads without damage. The site requires no special drainage and in this regard drainage costs can be significantly reduced. In contrast to solid concrete sites frost will not damage a site composed of grass and concrete since the former areas will take up expansion and contraction. The grass can be mowed without trouble and an overall grass appearance can be cultivated.

The various methods and types of sites which can be produced by this invention will become more apparent from the following description.

BRIEF DESCRIPTION OF DRAWINGS

Methods of producing sites in accordance with the invention will now be described, by way of examples only, with reference to, and as illustrated in, the accompanying drawings wherein:

FIG. **1** is a perspective view of a former made in accordance with the invention;

FIG. **2** is a sectional side view of a further former;

FIG. **3** is a plan view of the former shown in FIG. **2**;

FIG. **4** is a sectional view of part of a site constructed in accordance with the invention;

FIG. **5** is a plan view of the finished site shown in FIG. **1**;

FIG. **6** is a sectional view of part of a further site constructed in accordance with the invention; and

FIG. **7** is a sectional view of part of another site constructed in accordance with the invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

In carrying out the invention use is made of formers **11** made of fiber or plastics material which can have a variety of shapes more preferably resembling an egg tray such as shown in FIG. **1** of FIGS. **2** and **3**. Former **11** comprises a generally planar base sheet **9** having upper and lower surfaces **9***a* and **9***b* respectively and a plurality of upstanding hollow peaks **12** extending laterally outwardly from upper surface **9***a*. Peaks **12** are all approximately of the same height and they open outwardly of surface **9***b*. Thus, the open bases of peaks **12** are interconnected by base sheet **9** which presents a connecting web for peaks **12**. The upper extremity of each peak **12** is substantially closed by a top wall **16** whereby the sidewalls **12***a* of peaks **12**, top wall **16** and base sheet **9** present a generally continuous barrier disposed between and separating a first space **33** comprising the internal hollow spaces of the peaks **12** and a second space **32** generally surrounding the peaks. The formers **11** serve to separate soil from concrete or to separate different textured or colored concretious mixtures in a site made in accordance with the invention.

The formers can be made from low-cost self or chemically disintegratable material or from materials which will be more permanent. In certain applications the formers may be removed and re-used as is described hereinafter.

In one method of producing a site shown in FIG. **4** sub surface soil **10** is raked to loosen the same, levelled and seeded with grass. A number of formers **11** are then pressed into the loose sub soil **10** thus forcing the soil **10** into the hollow spaces **33** of frusto-conical peaks **12** of the formers **11**. The formers **11** may also be used with the peaks **12** extending downwardly. The individual formers preferably overlap at their margins and can be interlocked together. Concrete **13** is then placed over the whole area in space **32** and leveled off to coincide with the uppermost surface of the formers **11** so that little or no concrete lies on the top walls **16** of the peaks **12**. When the concrete **13** has hardened, the whole site area is rolled to the required degree of consolidation. The effect of this rolling is to crack the small amount of concrete which may still lie on the

walls **16** with the result that each peak **12** becomes an independent unit. The set concrete however retains its position. The walls **16** of peaks **12** of the formers **11** protect the seeded soil **15** therein from birds, winds etc. and serve to maintain ideal moist conditions up to the end of germination of the seed. After the germination period, natural disintegration of the walls **16** of the peaks **12** is speeded up by puncturing or tearing away, or chemically dissolving or burning the walls **16** of the peaks **12**. The formers **11** can be made from a transparent plastics material so that the grass growth can be observed. The formers **11** are preferably held in position during installation by using a mesh reinforcement depicted by reference numeral **100** in FIGS. **2** and **3** and this increases the rigidity of the site. A series of supports **101** which extend between peaks **12** may be used to support reinforcement **100** as can be seen in FIGS. **2** & **3**.

As shown in FIG. **5** the finished site is then composed of a continuous concrete areas **17** interspersed with separate grass areas **18**. In an alternative process seeding is not carried out initially but a mixture of soil and seed is brushed into the gaps **19** (FIG. **4**) which have resulted from puncturing, tearing away or dissolving or burning the upper walls **16** of the peaks **12** of the formers **11**.

In another process small natural turf divots can be pressed down into the cavities **19** thus immediately producing the natural grass areas **18**.

In a further alternative process divots of imitation grass made of synthetic plastics material are placed in the areas **18** of FIG. **5**. The base of each plastics divot together with a small quantity of soil, sand or sand-cement is pressed through the gaps left by removal of the walls **16** of the peaks **12** and engages with the tapering sides of the gaps **19**, so that even with sand or soil filling considerable effort is required to remove a plastics divot once the latter is in position.

Where a sand-cement filling is used, the plastic divots can, of course, be permanently fixed and this has the advantage that the growth of natural grass or weeds over the site is eliminated.

The base onto which the formers **11** are laid can be composed of ballast or of concrete where the finished site is to withstand heavy loads and in this regard another process is depicted in FIG. **6**. As shown in FIG. **6** a concrete base **30** is laid first, the formers **11** are pressed into the base **30** whilst the latter is still wet and plastic so that concrete **13** rises to the top of the spaces **33** in peaks **12**. The top wall **16** of each peak **12** preferably contains one or more small holes **31** to prevent air being trapped beneath the wall **16**. After the concrete has set, soil and grass seed **15** is laid into the spaces **32** between the peaks **12** the whole site being rolled to achieve cracking and drainage between the peaks **12** and the top walls **16** of the peaks **12** removed as before.

In this case the site will appear as in FIG. **5** except the areas **17** will be soil and grass areas and the areas **18** will be concrete the whole site having the firm base **30** beneath these areas **17**, **18**.

The depth of the concrete base **30** underneath the areas **17**, **18** can be reinforced to avoid cracking during rolling and consolidation.

To achieve dual or multi-colored concrete site area the process depicted in FIG. **7** can be adapted. For dual colored concrete areas one color concrete **40** is laid first the formers **11** impressed therein as in FIG. **4** to force concrete **40** into space **33**. The different color concrete **41** is then laid over the formers **11** in space **32** and the walls **16** of the peaks **12** removed.

Thus the site will appear as in FIG. **5** except the areas **17** will represent areas of concrete of one color and the areas **18** will represent areas of concrete of the other color.

For multi-colored concrete sites the underside **43** of the top walls **16** of the peaks **12** in the formers **11** are treated with different colored dyes, which, when brought into contact with wet concrete, stain and penetrate the latter. After the removal of the walls **16** such colors become visible and contrast with the area **17** shown in FIG. **5**.

It should be understood that the contour of the formers **11** can be of various sizes, depths and widths, with rectangular, square, circular or octagonal peaks **12**.

It is envisaged that the formers would be of relatively low cost, and would be left in position sandwiched between the various areas in the site, but for some operations such as those depicted in FIGS. **6** and **7** the formers can be produced from more permanent materials and lifted for re-use after the base concrete (**30**, **40**) has hardened and before the top soil or concrete (**32**, **41**) is laid.

In all cases wire mesh reinforcement (**100** in FIGS. **2** and **3**) can be laid on the formers **11** i.e. between the peaks **12** and such reinforcement can be completely surrounded by concrete.

The invention can also be applied to camouflage an airfield where grass is induced to cover the entire concrete site. In another application of the invention the peaks **12** of the formers **11** can be used in marking roads. Thus by painting the upper surfaces of walls **16** of the peaks **12** with a fluorescent or reflecting material cat's eyes for roads can be produced. The invention can also be extended to the production of paving slabs incorporating formers or incorporating cavities produced by such formers.

I claim:

1. A method of producing a pavement-like site comprising areas of a first character generally surrounded by interconnected areas of another character, said method comprising:

providing said site with a continuous covering comprising an initially laterally displaceable, generally formable first material;

shaping said covering with a former comprising a generally planar base sheet having a pair of surfaces and a plurality of hollow peaks extending laterally outwardly from one surface of the base sheet, said peaks all being approximately of the same height and opening outwardly of the other surface of the base sheet, each of the peaks being substantially closed at the extremity thereof remote from the base sheet whereby the walls of the peaks and the base sheet present a generally continuous barrier disposed between and separating a first space comprising the internal hollow spaces of the peaks and a second space generally surrounding the peaks,

said shaping comprising laying the former on said covering at the site with the base sheet disposed in substantial parallelism to the upper surface of the covering and with the peaks extending upwardly, and forcing the former downwardly to impress it into the first material until substantially the entirety of the former is at or beneath a level predetermined for the surface of the site and the first space has been substantially filled by said first material displaced into the hollow spaces of the peaks during said impressing of the former into the first material; and filling the spaces formed between the spaced peaks of the displaced first material with an initially displaceable, generally formable second material, said first and second materials each having a different character.

2. A method as set forth in claim **1** wherein said first material comprises loose soil and said second material comprises fluid concrete.

3. A method as set forth in claim **1** wherein said second material comprises loose soil and said first material comprises fluid concrete.

4. A method as set forth in claim **1** wherein said first material comprises fluid concrete of a first color and said second material comprises fluid concrete of a second color.

5. A method as set forth in claim **2** wherein said loose soil includes grass seed.

6. A method as set forth in claim **2** wherein said fluid concrete is poured into said second space while the former remains in contact with the soil.

7. A method as set forth in claim **1** wherein said filling step comprises filling said second space with the second material while the former remains in contact with said first material.

8. A method as set forth in claim 5 wherein said fluid concrete is poured into said second space while the former remains in contact with the soil.

9. A method as set forth in claim 8 wherein is included the step of removing the extremities of the peaks remote from the base sheet after said concrete has been poured to permit growth of grass.

10. A method as set forth in claim 4 wherein is included the step of placing a coloring substance in the internal hollow spaces of the peaks at the extremities thereof remote from the base sheet whereby said fluid concrete of a first color is produced by contacting said coloring substance during the impressing of the former into the concrete comprising said first material.

11. A method as set forth in claim 1 wherein is included the step of removing said former after said first material has been formed and prior to said filling step.

* * * * *