CLAIMS

1. A cementitious product comprising:

a substrate formed from a cementitious material; and

at least one branched channel embedded within the substrate configured to provide a conduit for a second material to flow through the substrate;

wherein the at least one branched channel comprises a plurality of interconnected channel elements, wherein the channel elements are repeatable units selected from a finite number of different types of channel elements, formed separately and configured to be connected via input/output portions during assembly of the branched channel, the plurality of interconnected channel elements comprising at least one channel element comprising at least one diverging portion at which a plurality of paths diverge from a common path, and at least one further channel element comprising at least one converging portion at which a plurality of paths converge to a common path,

wherein the channel elements comprise respective male and female engaging parts configured to connect adjacent channel elements;

wherein the branched channel comprises at least one of each of the following types of channel element:

a branching channel element comprising m input/output portions connected to n further input/output portions, where $m > 0$ and $m < n$, and only one diverging portion or only one converging portion;

a branching channel element comprising m input/output portions connected to n further input/output portions, where $m > 1$ and $m < n$, and at least two diverging portions are connected at a converging portion or at least two converging portions are connected at a diverging portion;

a branched joining channel element comprising p input/output portion connected to p further input/output portion, where $p > 0$, and at least one branching cell comprising one diverging portion and one converging portion having the same number of paths, said paths being respectively directly connected to each other;

a branched joining channel element comprising p input/output portion connected to p further input/output portion, where $p > 1$, and comprising p single paths comprising one input/output portion connected to one further input/output portion, said single paths connected to each other by at least one linking path.

2. The cementitious product of claim 1, wherein the branched channel comprises at least one type of channel element that is a branched joining channel element comprising one input/output portion connected to one further input/output portion, and multiple branching cells arranged in series, each branching cell comprising one diverging portion and one converging portion having the same number of paths, said paths being respectively directly connected to each other.

3. The cementitious product of any preceding claim, wherein the plurality of interconnected channel elements extend substantially in two orthogonal directions.

4. The cementitious product of any one of claims 1 to 3 wherein the plurality of interconnected channel elements extend substantially in three orthogonal directions.

5. The cementitious product of any preceding claim, wherein the channel elements are formed from a polymer material.

6. The cementitious product of claim 5, wherein the channel elements are formed from a PLA.

7. The cementitious product of any preceding claim, comprising the second material within the at least one branched channel.

8. The cementitious product of any preceding claim, wherein the second material comprises gap filling material configured to fill gaps in the cementitious product.

9. A branched channel for use in the cementitious product of any preceding claim, comprising:

a plurality of interconnected channel elements, wherein the channel elements are repeatable units selected from a finite number of different types of channel elements, formed separately and configured to be connected via input/output portions during assembly of the branched channel, the plurality of interconnected channel elements comprising at least one channel element comprising at least one diverging portion at which a plurality of paths diverge from a common path, and at least one further channel element comprising at least one converging portion at which a plurality of paths converge to a common path,

wherein the channel elements comprise respective male and female engaging parts configured to connect adjacent channel elements;

wherein the branched channel comprises at least one of each of the following types of channel element:

a branching channel element comprising m input/output portions connected to n further input/output portions, where $m > 0$ and $m < n$, and only one diverging portion or only one converging portion;

a branching channel element comprising m input/output portions connected to n further input/output portions, where $m > 1$ and $m < n$, and at least two diverging portions are connected at a converging portion or at least two converging portions are connected at a diverging portion;

a branched joining channel element comprising p input/output portion connected to p further input/output portion, where $p > 0$, and at least one branching cell comprising one diverging portion and one converging portion having the same number of paths, said paths being respectively directly connected to each other;

a branched joining channel element comprising p input/output portion connected to p further input/output portion, where $p > 1$, and comprising p single paths comprising one input/output portion connected to one further input/output portion, said single paths connected to each other by at least one linking path;

the branched channel being configured to be embedded within the substrate formed from a cementitious material, and to provide a conduit for a fluid material to flow through the substrate.

10. A kit of parts for forming a branched channel, the branched channel being configured to be embedded within a substrate formed from a cementitious material, and to provide a conduit for a fluid material to flow through the substrate comprising:

a plurality of channel elements, wherein the channel elements are repeatable units selected from a finite number of different types of channel elements, formed separately and configured to be connected via input/output portions during assembly of the branched channel, the plurality of interconnected channel elements comprising at least one channel element comprising at least one diverging portion at which a plurality of paths diverge from a common path, and at least one further channel element comprising at least one converging portion at which a plurality of paths converge to a common path,

wherein the channel elements comprise respective male and female engaging parts configured to connect adjacent channel elements;

wherein the kit of parts comprises at least one of each of the following types of channel element:

a branching channel element comprising m input/output portions connected to n further input/output portions, where $m > 0$ and $m < n$, and only one diverging portion or only one converging portion;

a branching channel element comprising m input/output portions connected to n further input/output portions, where $m > 1$ and $m < n$, and at least two diverging portions are connected at a converging portion or at least two converging portions are connected at a diverging portion;

a branched joining channel element comprising p input/output portion connected to p further input/output portion, where $p > 0$, and at least one branching cell comprising one diverging portion and one converging portion having the same number of paths, said paths being respectively directly connected to each other;

a branched joining channel element comprising p input/output portion connected to p further input/output portion, where $p > 1$, and comprising p single paths comprising one input/output portion connected to one further input/output portion, said single paths connected to each other by at least one linking path;

the plurality of channel elements being configured to be interconnected to form the branched channel configured to be embedded within the substrate formed from a cementitious material and to provide a conduit for a fluid material to flow through the substrate.

11. A branched channel formed from the kit of parts of claim 10, the branched channel configured to be embedded within a substrate formed from a cementitious material and to provide a conduit for a fluid material to flow through the substrate.

12. A cementitious product comprising the branched channel of claim 11 embedded within the substrate formed from a cementitious material, and configured to provide a conduit for the fluid material to flow through the substrate.

13. A method of forming a cementitious product comprising:

forming at least one branched channel from the kit of parts of claim 10, and/or according to claim 9, configured to provide a conduit for a second material to flow through the substrate; and

forming a substrate from a cementitious material around the least one branched channel, to embed the at least one branched channel within the substrate.

14. A method of healing the cementitious product of any one of claims 1 to 8 or 12, comprising flowing the second material through the at least one branching channel.

15. A method of preventing corrosion of the cementitious product of any one of claims 1 to 8 or 12, comprising flowing the second material through the at least one branching channel.

16. A method of forming a branched channel for use in the cementitious product of any one of claims 1 to 8 or 12, comprising:

forming the plurality of channel elements;

connecting the plurality of channel elements together to from the branched channel.

17. The cementitious product, branched channel, kit of parts, or method of any preceding claim, wherein the male and female engaging parts are bonded together.

18. The cementitious product, branched channel, kit of parts or method of claim 17, wherein the bonding is performed by heat welding or solvent welding.