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(54) Title: WALLING SYSTEM

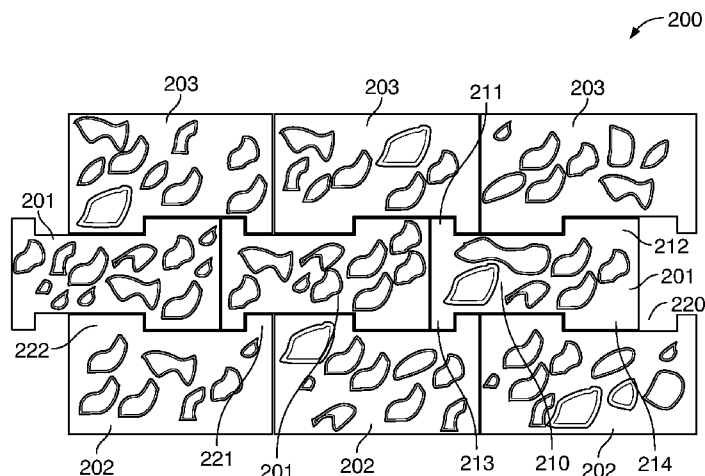


FIG. 2

(57) Abstract: A walling system (200,300,400) comprising blocks (201,202,203,401), wherein each block comprises aggregate bound by a binder, further wherein a first block (201) of the system comprises a central portion (210) with first (211) and second (212) engagement projections extending from an edge of said first block; a second block (202) of the system comprises a central portion with first (221) and second (222) engagement projections extending from an edge of said second block; and a third block (203) of the system comprises an engagement recess (220), the engagement recess sized to accommodate an engagement projection from the first block and the second block concurrently. In this way, an adjustable, modular walling system is provided.

EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

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Walling System

Field of the Invention

5 The present invention relates to a walling system, and more particularly to a walling system comprising blocks made of aggregate bound by binder which interact to assist in the construction of a wall.

Background to the Invention

10 The use of flint in the construction of walls is well established, having been used since Roman times. During construction of a typical flint wall, individual flints are located in position before being held in place using a lime mortar or similar. Such a construction process is labour intensive, as each flint must be placed in position and the subsequently secured by hand. As such, this process of wall building decreased in popularity as bricks and other pre-fabricated walling solutions were developed.

15 However, whilst labour intensive, the appearance of a flint wall is often considered to be highly desirable. Therefore, in recent years, construction of flint wall buildings has increased in popularity, with significant numbers of new build houses now incorporating some flint work in their exterior walls.

20 The recent increase in the number of buildings including flint walling has led to new approaches to flint wall construction, with the aim of increasing the ease of construction. As a first step, rectangular blocks were developed, where these blocks included a large number of flints protruding through a single, textured face to provide the appearance of an 'all flint' construction. As these blocks were rectangular, they could then be used in a similar fashion to normal bricks or breeze blocks during the construction of a wall.

30 Whilst these rectangular blocks certainly increase the ease of construction of a flint wall, they are not without their disadvantages. The use of rectangular blocks results in long, straight lines of mortar or other binding material across the surface of a wall, where adjacent blocks are joined to one another. The human eye is very adept at noticing such patterns in the flint construction and, as such, a wall constructed in this way often has a relatively unnatural appearance.

35 To overcome the problem of long, straight lines across the surface of a wall, these 'multiple flint' blocks were developed such that they no longer had a rectangular shape. Instead, blocks

were constructed with curved edges to ensure the joints between adjacent blocks no longer extended along long, straight lines. These curved blocks are designed in sets which tessellate to allow for wall construction.

- 5 The provision of blocks with curved edges is very successful in disrupting the visual impact of the joints between block in any flint wall, and such walls are typically natural in appearance to the human eye. However, the introduction of curved blocks does increase the challenge of wall construction quite considerably.
- 10 When tessellating sets of curved blocks are used for the construction of a flint wall, any one block must be located very precisely next to adjacent blocks during wall construction. The curved edges of the blocks mean they do not 'sit together' in a wide range of positions as rectangular blocks do. Therefore, if any adjustment of the blocks is required, for example due to the need to vary the length of the flint wall around features such as a window or door, this
- 15 can prove challenging, especially to those who are less experienced in building with curved blocks.

Summary of the Invention

- 20 According to a first aspect of the present invention, there is provided a walling system comprising blocks, wherein each block comprises aggregate bound by a binder, further wherein; a first block of the system comprises a central portion with first and second engagement projections extending from an edge of said first block; a second block of the system comprises a central portion with first and second engagement projections extending
- 25 from an edge of said second block; and a third block of the system comprises an engagement recess, the engagement recess sized to accommodate an engagement projection from said first block and said second block concurrently.

- 30 In this way, a modular walling system comprising where the position of the first and second blocks may be adjusted in relation to the position of the third block is provided.

- Preferably, the engagement recess is sized to accommodate an engagement projection from said first block and said second block concurrently, when said first block and said second block are adjacent one another. More preferably, the engagement recess is sized to
- 35 accommodate an engagement projection from said first block and said second block concurrently, when said first block and said second block abut one another.

Preferably, the engagement recess is sized to fit an engagement projection from said first block and said second block concurrently, when said first block and said second block are adjacent one another. More preferably, the engagement recess is sized to fit an engagement projection from said first block and said second block concurrently, when said first block and said second block abut one another.

Preferably, the first engagement projection of the first block and the first engagement projection of the second block have a first length, and the second engagement projection of the first block and the second engagement projection of the second block have a different length.

Preferably, the first engagement projection of the first block is located at a first end of the first block, and the second engagement projection of the first block is located at a second end of the first block. Preferably, the first engagement projection of the second block is located at a first end of the second block, and the second engagement projection of the second block is located at a second end of the second block.

Preferably, the engagement recess has the same length as the distance between the first engagement projection of the first block and the second engagement projection of the first block and/or the same length as the distance between the first engagement projection of the second block and the second engagement projection of the second block.

Preferably, the first block is shaped to provide mirror symmetry along its longitudinal axis. Preferably, the second block is shaped to provide mirror symmetry along its longitudinal axis. Preferably, the engagement recess of the third block lies between a first engagement projection and a second engagement projection located along an edge of the third block. More preferably, the first engagement projection of the third block has the same length as the first engagement projection of the first and second block, and the second engagement projection of the third block has the same length as the second engagement projection of the first and second blocks.

Preferably, the first engagement projection of the third block is located at a first end of the third block, and the second engagement projection of the third block is located at the second end of the third block.

Preferably, at least one engagement projection is a tab. Preferably, at least one engagement projection is elongate.

Preferably, the aggregate protrudes through a single surface of each block. More preferably, the protruding aggregate provides a textured surface. Preferably, the aggregate comprises flint.

5 Preferably, the engagement recess consists of straight edges. Preferably, the engagement projections comprise straight edges. More preferably, the perimeter of the first, second and third blocks consists of straight edges.

Preferably, the walling system further comprises loose aggregate. More preferably, the loose aggregate is the same aggregate as that contained within the blocks. Most preferably, the loose aggregate is lint.

10 Preferably, the walling system comprises a further rectangular block with the same length as the engagement recess of the third block. More preferably, this block comprises aggregate bound by a binder.

According to a second aspect of the present invention, there is provided a wall formed from the walling system of any preceding claim, wherein the blocks of said walling system are joined
15 by a binder.

Detailed Description

Embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

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Figure 1 is a schematic view of a prior art system used in flint wall construction;

Figure 2 is a schematic view of an embodiment of the walling system comprising a plurality of blocks;

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Figure 3 is a schematic illustration of an embodiment of the walling system in a different configuration to that depicted in Figure 2;

Figure 4 is a schematic illustration of an embodiment of the walling system in a different
30 configuration to that depicted in Figure 2 and Figure 3; and

Figures 5 to 8 are schematic illustrations of an embodiment of the walling system in different configurations to that depicted in Figures 2 to 4.

Referring first to Figure 1 of the drawings, a prior art walling system 100 is illustrated. As depicted, the walling system comprises first, 101, second 102, third 103, and fourth 104 block variations, each block variation positioned in relation to the others to ensure the blocks interlink or tessellate to such that there are no gaps or overlaps in the plane of the paper. By arranging the block variations 101, 102, 103, 104 in this way, it is possible to build or construct a structural wall, for example the exterior wall of a house.

In this prior art walling system, each block comprises knapped or unknapped flints which protrude through a single surface of the block. The flints themselves are bound by a binder such as cement to form the shape and structure of each of the individual blocks. Where the various blocks 101, 102, 103, 104 are used to form a wall, the blocks themselves may be joined by a cement or other binding mixture to form a structurally sound wall. The various blocks 101, 102, 103, 104 are designed and shaped such that they can be position next to one another in a variety of combinations. Additionally, due to the construction of the blocks it is possible to cut and/or trim the blocks to size if required. However, due to the curved lengthwise edges of the blocks, the ability of each block to slide in relation to its neighbours is limited.

The ideas present by the prior art illustrated in Figure 1 are developed in the embodiment of the invention depicted in Figure 2. In Figure 2, a walling system 200 is shown, this walling system comprising first 201, second 202 and third 203 block variations. Here, each block comprises both knapped and unknapped flints bound together to form the various block shapes with a concrete binder. In each of the block variations, the knapped and unknapped flints protrude through a single surface of the block, providing a textured surface.

In each case, the majority of the textured surface comprises pieces of flint. Each piece of flint extends from within the interior of the block, out through the block surface to provide an undulating surface profile.

The first block variation 201 comprises a central portion 210 from which first 211 and second 212 engagement projections extend. Each of the engagement projections 211, 212 extends from the central portion 210 away from the longitudinal axis of the first block variation 201, such that the engagement projections 211, 212 extend further from the longitudinal axis of the first block variation 201 than the central portion 210.

Each of the first 211 and second 212 engagement projections are elongate. Both the first 211 and the second 212 engagement projections are tabs. As shown in Figure 2, the first engagement projection 211 is shorter in length than the second engagement projection 212.

The first engagement projection 211 is located at a first end of the first block variation 201. The second engagement projection 212 is located at a second end of the first block variation 201. As such, the first engagement projection 211 and the second engagement projection 212 define a recess between them, this recess extending parallel to the longitudinal axis of the first block variation 201. Other variations in the shape of the engagement projections are also envisaged by the inventors, where these variations allow adjacent blocks to interlink and slide in relation to one another.

The first block variation 201 has a line of mirror symmetry extending along its longitudinal axis. In this way, the first engagement projection 211 and the second engagement projection 212 are mirrored to form the third engagement projection 213 and the fourth engagement projection 214. Then, the length of the first 211 and third 213 engagement projections is equal, and the length of the second 212 and fourth 214 engagement projections is also equal. The edges of the first block variation 201 linear and, as such, the first block variation may be viewed as constructed from three abutting rectangles. Overall, the first block variation 201 comprises a shape that is similar to that of an I beam or H beam.

As illustrated in Figure 2, the wall system 200 may comprise a plurality of blocks with the shape of the first block variation 201. Blocks with the shape of the first block variation 201 may be positioned adjacent one another, such that the first engagement projection 211 of one block with the shape of the first block variation 201 may be positioned adjacent to the second engagement projection 212 of one block with the shape of the first block variation 201. Such an arrangement of blocks may be used as part of the walling system 200, though many other variations in block positioning are envisaged by the inventors.

The second block variation 202 comprises an engagement recess 220 which extends partially along the length of one side of the block. This engagement recess 220 is sized such that its depth is the same as the length which the first 211, second 212, third 213 and fourth 214 engagement projections extend from the central portion of the first block variation 201. The engagement recess 220 extends along the length of the second block variation 202 for a length which is approximately equal to, or slightly larger than the combined length of the first 211 and second 212 engagement projections. In this way, the engagement recess 220 is sized to fit a first engagement portion 211 from a first block with the shape of the first block variation 201 and a second engagement portion 212 from a second block with the shape of the first block variation 201 at the same time or concurrently.

The extent of the engagement recess 220 may be defined by a first engagement projection 221 and a second engagement projection 222 which extend from the main body of the second block variation 202. Each of the engagement projections 221, 222 extends from the main body of the second block variation 202 away from its longitudinal such that the engagement projections 221, 222 extend further from the longitudinal axis of the second block variation 202 than any other point of the main body.

The length of the engagement recess 220 is equal to the length of the first block variation 201 between the first engagement projection 211 and the second engagement projection 212. Additionally, the first engagement projection 221 of the second block variation 202 has the same length as the first engagement projection 211 of the first block variation 201, and the second engagement projection 222 of the second block variation 202 has the same length as the second engagement projection 212 of the first block variation. The side of the second block variation 202 which lies opposite the side from which the first 221 and second 222 engagement projections extends is planar.

The third block variation 203 has an overall shape that is a mirror image of the second block variation 202.

As can be seen from Figure 2, the complimentary, interlocking or tessellating features of the first 201, second 202 and third 203 block variations allows each block variation to be positioned in relation to the others to ensure there are no gaps or overlaps in the plane of the paper. In this way, a wall may be constructed from these block variations, the blocks themselves joined by a suitable binding mixture such as cement. It will be appreciated that the complimentary features of the block variations 201, 202, 203 illustrated in Figure 2 ensure many separate combinations of these blocks may be used to form a wall. Therefore, many other combinations of blocks are also envisaged by the inventors, including variations where multiple course of blocks with the shape of the first block variation 201 are located between exterior courses of the second 202 and third 203 variations.

An arrangement of blocks such as that depicted in Figure 2 will be suitable for the majority of wall construction. However, in some areas, the natural patterning of the blocks will need to be adjusted to accommodate wall edges or other feature such as windows and doors. The ability of this embodiment of the invention to provide these adjustment is depicted in Figure 3.

The wall system 300 of Figure 3 comprises blocks with the shape of the first 201, second 202 and third 203 block variations described in relation to Figure 2. However, at the right-hand

side of this wall system, the regular positioning of the blocks has been altered with a block shaped according to the second shape variation 202-A swapping position with a block shaped according to the third shape variation 203-A. This rearrangement of the blocks disrupts the tessellating or interlocking pattern seen in the wall system 300, creating gaps in the structure.

5

These gaps in the structure allow the swapped blocks 202-A and 203-A to slide in relation to a block in the shape of the first shape variation 201-A (see arrows). The ability of these peripheral blocks to slide in relation to one another allows the overall length of the wall system 300 to be precisely adjusted, to ensure it may be tailored to fit the required space or construction brief. After blocks 202-A and 203-A have been slid into the correct position, the gaps in the overall walling system may be filled with loose aggregate or other, pre-cut blocks, to provide the complete wall structure required after all components of the wall have been bonded into position.

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Again, the complimentary nature of the walling system blocks depicted in Figure 3 ensures that several combinations of slidable blocks are possible. As such, the system depicted in Figure 3 is exemplary only, and the inventors also envisage arrangements of the block variations where any one block variations may slide in relation to the others to be included in the scope of this invention.

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A second embodiment of the present claimed invention is a walling system 400 as illustrated in Figure 4. Here, as in the walling systems depicted in Figures 2 and 3, the walling system 400 comprises blocks with the shape of the first 201, second 202 and third 203 block variations described in relation to Figure 2. In this embodiment of the invention, the walling system further comprises a fourth block variation 401. The fourth block variation 401 again comprises both knapped and unknapped flints bound together with a concrete binder. Additionally, the knapped and unknapped flints protrude through a single surface of the block, providing a textured surface.

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The fourth block variation 401 is rectangular in shape, with a length equal to that of the engagement recess 220. As the engagement recess 220 is equal to the length of the first block variation 201 between the first engagement projection 211 and the second engagement projection 212, the fourth block variation is also equal to this length. Therefore, the fourth block variation 401 may be used to interlink various combinations of the first, second and third block variations, with an example of such a tessellation depicted in Figure 4. In this way, the height of the wall system 400 may be adjusted, with the fourth block variation 401 used to increase the repeating length of the walling system in the vertical direction as required.

30
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Overall, the embodiment of the invention described herein includes a series of block variations comprising features that are complimentary in shape to both other features on equivalent blocks, and features on differently shaped blocks. This array of complimentary features allows the blocks which form the wall system to be position in a number of different positions relative to one another, to provide a wall system that is adjustable in both its height and length. Such a feature is advantageous as it allows the shape of any wall to be easily adjusted in line with the requirements of the construction project, before being secured in place using a cement or other suitable binder. Examples of other arrangements of the first 201, second 202, third 203 and fourth 401 block variations are illustrated in Figures 5 to 8, although further variations of the arrangement of these block variations are also envisaged by the inventors.

CLAIMS

1. A walling system comprising blocks, wherein each block comprises aggregate bound by a binder, further wherein;
5 a first block of the system comprises a central portion with first and second engagement projections extending from an edge of said first block;
a second block of the system comprises a central portion with first and second engagement projections extending from an edge of said second block; and
a third block of the system comprises an engagement recess, the engagement recess
10 sized to accommodate an engagement projection from said first block and said second block concurrently.
2. The walling system of claim 1, wherein said engagement recess is sized to accommodate an engagement projection from said first block and said second block
15 concurrently, when said first block and said second block are adjacent one another.
3. The walling system of claim 2, wherein said engagement recess is sized to fit an engagement projection from said first block and said second block concurrently, when said first block and said second block are adjacent one another.
20
4. The walling system of any preceding claim, wherein said first engagement projection of said first block and said first engagement projection of said second block have a first length, and said second engagement projection of said first block and said second engagement projection of said second block have a different length.
25
5. The walling system of any preceding claim, wherein the first engagement projection of the first block is located at a first end of the first block, and the second engagement projection of the first block is located at a second end of the first block.
- 30 6. The walling system of any preceding claim, wherein the first engagement projection of the second block is located at a first end of the second block, and the second engagement projection of the second block is located at a second end of the second block.
- 35 7. The walling system of any preceding claim, wherein the engagement recess has the same length as the distance between the first engagement projection of the first block and the second engagement projection of the first block and/or the same length as the

as the distance between the first engagement projection of the second block and the second engagement projection of the second block.

- 5 8. A walling system as claimed in any preceding claim, wherein the first block is shaped to provide mirror symmetry along its longitudinal axis.
9. A walling system as claimed in any preceding claim, wherein the second block is shaped to provide mirror symmetry along its longitudinal axis.
- 10 10. A walling system as claimed in any preceding claim, wherein the engagement recess of the third block lies between a first engagement projection and a second engagement projection located along an edge of the third block.
- 15 11. A walling system as claimed in claim 10 when dependent on claim 4, wherein the first engagement projection of the third block has the same length as the first engagement projection of the first and second block, and the second engagement projection of the third block has the same length as the second engagement projection of the first and second blocks.
- 20 12. A walling system as claimed in claim 10 or claim 11, wherein the first engagement projection of the third block is located at a first end of the third block, and the second engagement projection of the third block is located at the second end of the third block.
- 25 13. The walling system as claimed in any preceding claim, wherein at least one engagement projection is a tab.
14. A walling system as claimed in any preceding claim, wherein the aggregate protrudes through a single surface of each block.
- 30 15. A walling system according to claim 14 , wherein the protruding aggregate provides a textured surface.
16. A walling system according to any preceding claim, wherein the aggregate comprises flint.
- 35 17. A walling system according to any preceding claim, wherein the perimeter of the first, second and third blocks consists of straight edges.

18. A walling system according to any preceding claim, wherein the walling system further comprises loose aggregate.

5 19. A walling system according to any preceding claim, comprising a further rectangular block with the same length as the engagement recess of the third block.

20. A wall formed from the walling system of any preceding claim, wherein the blocks of said walling system are joined by a binder.

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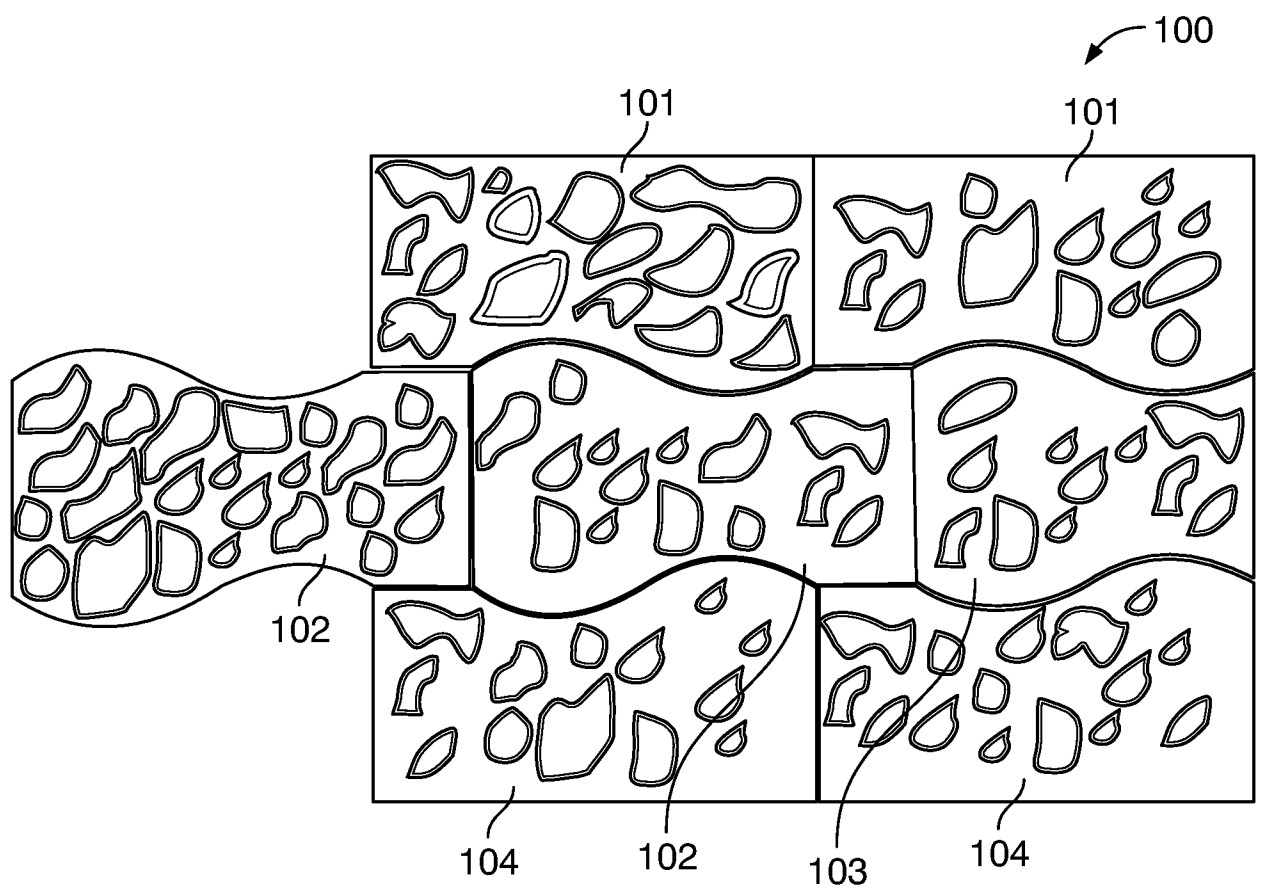


FIG. 1

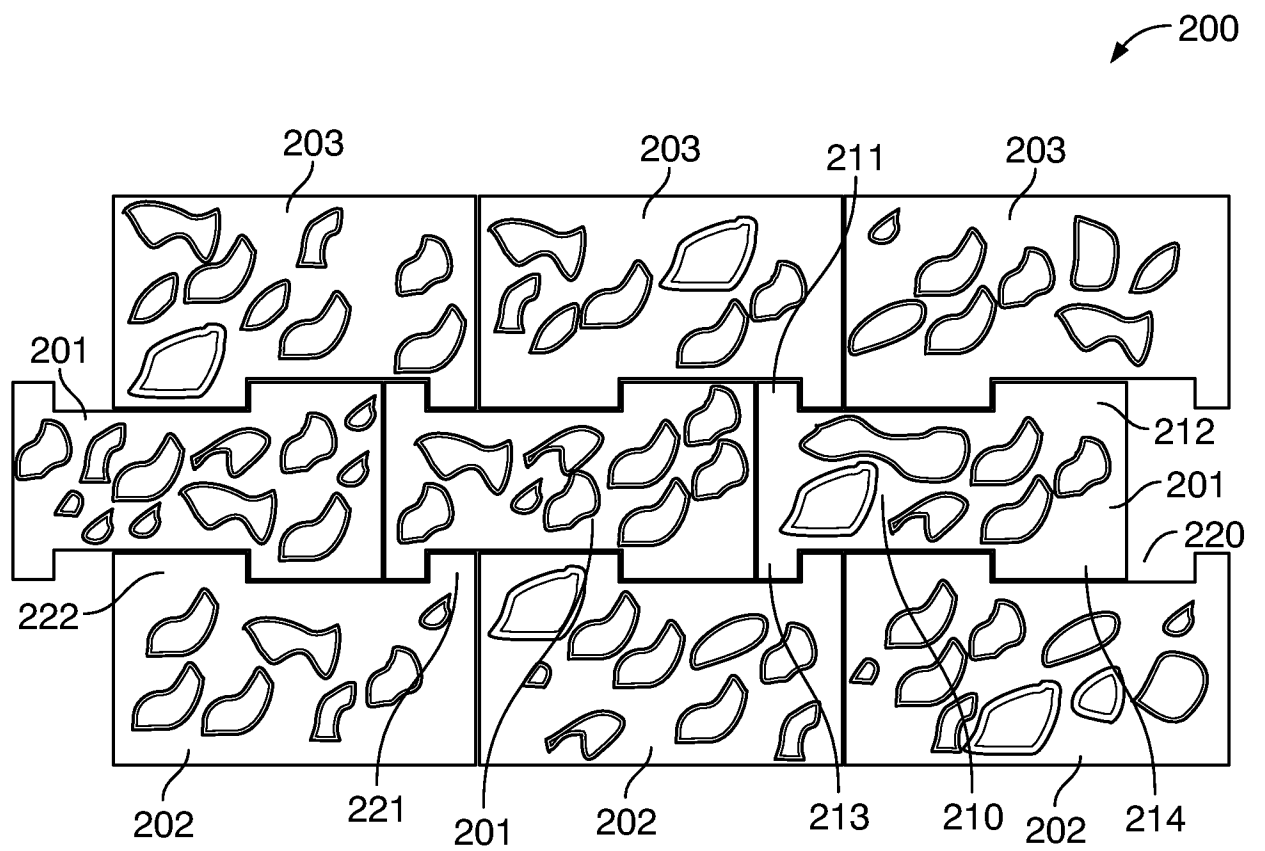


FIG. 2

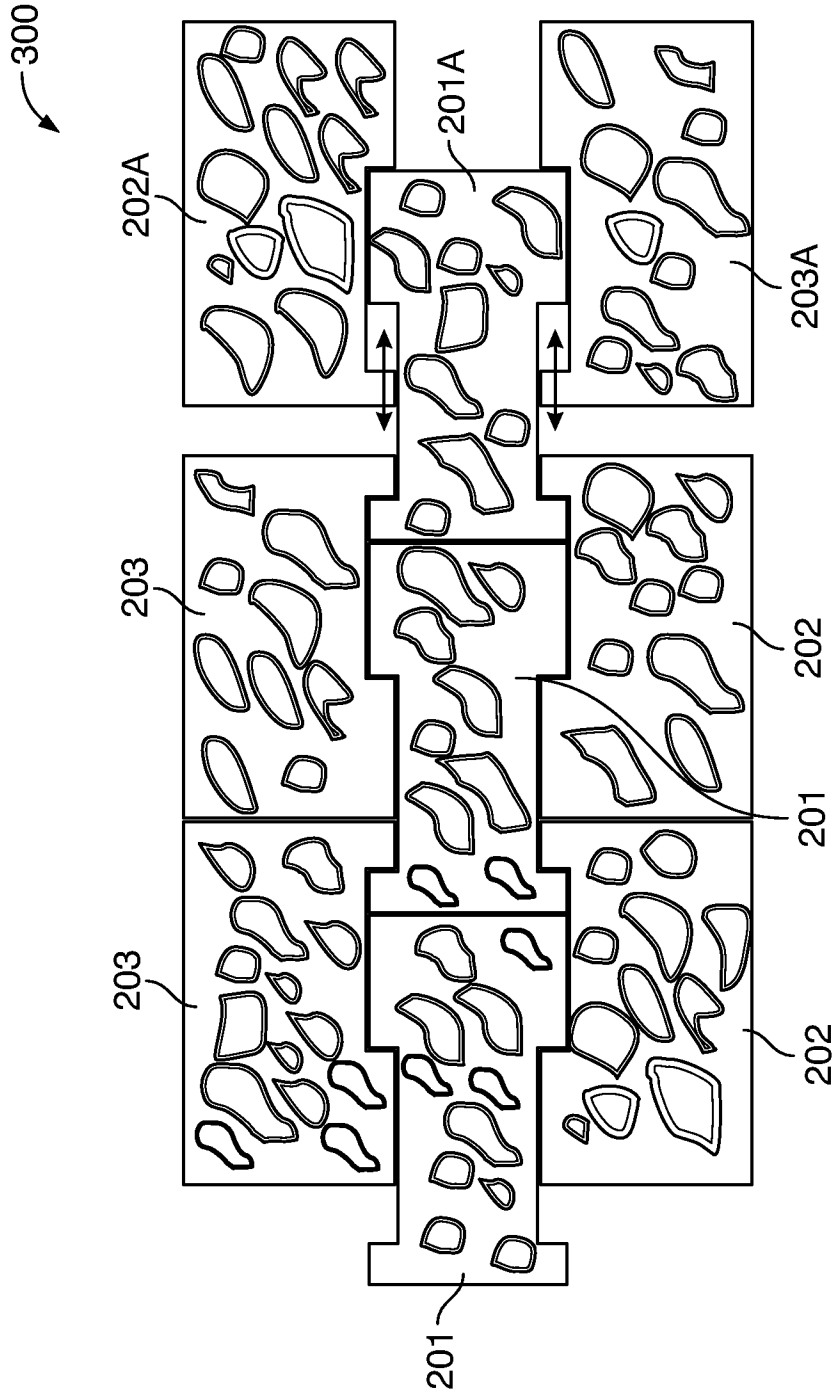


FIG. 3

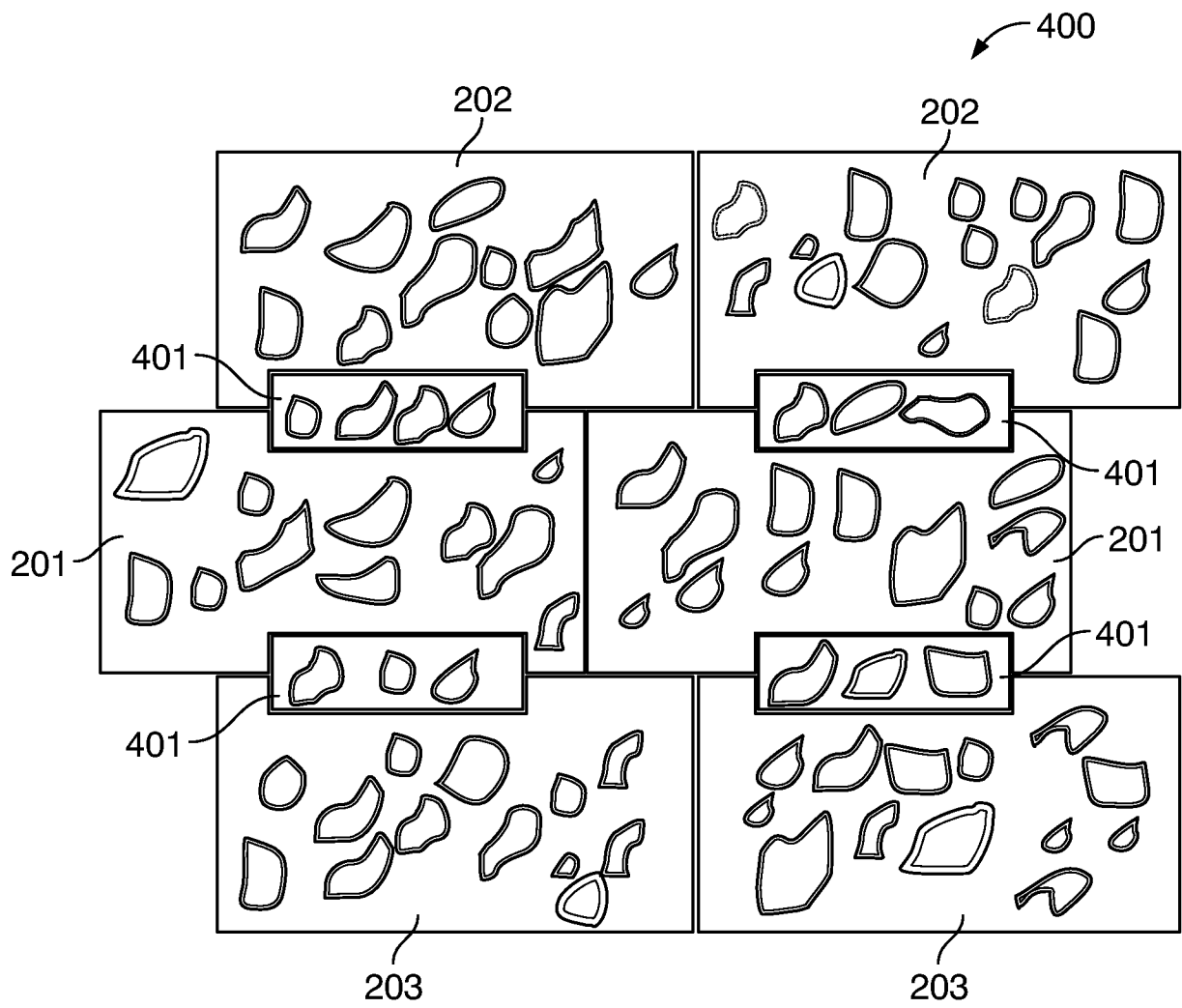


FIG.4

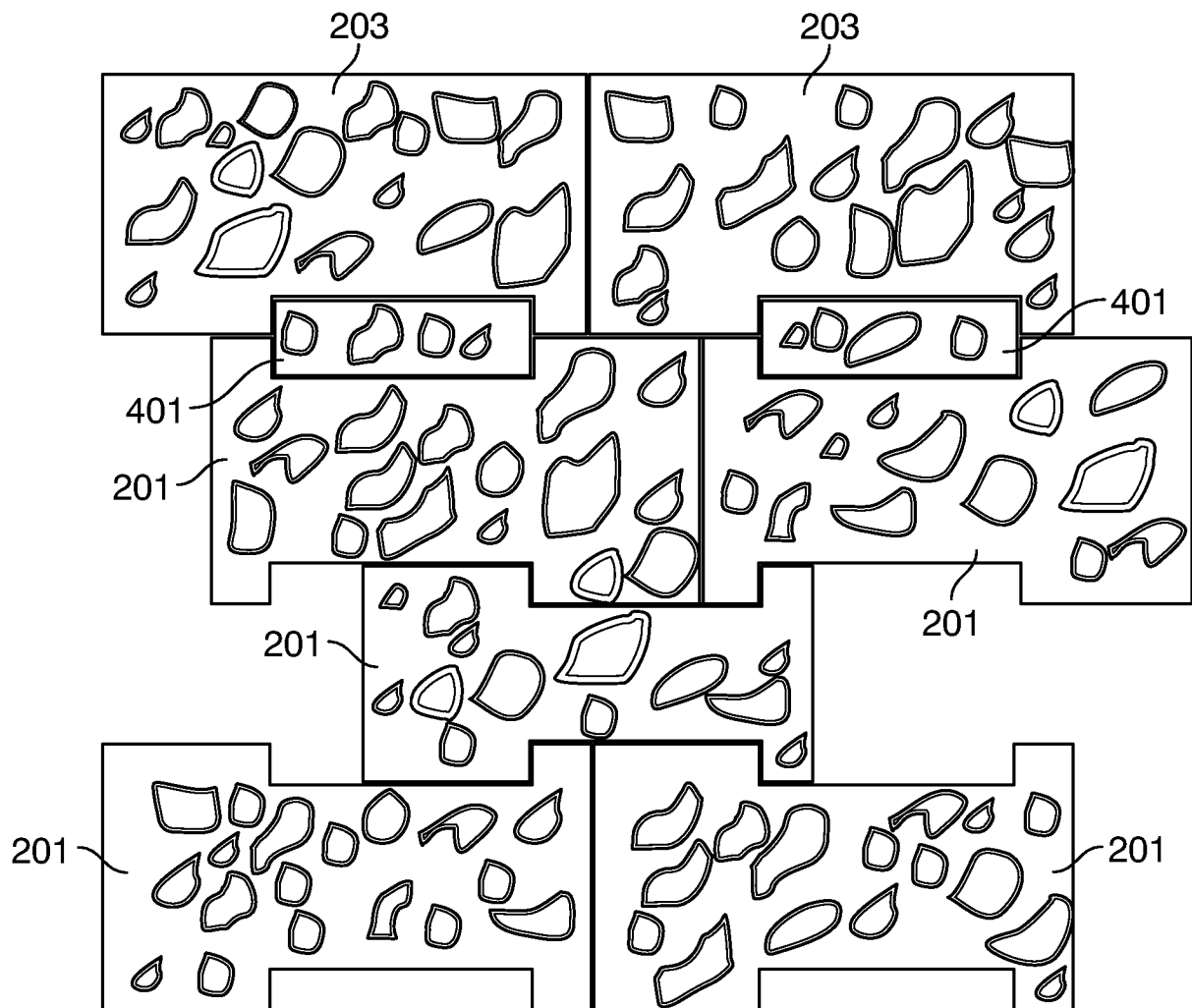


FIG. 5

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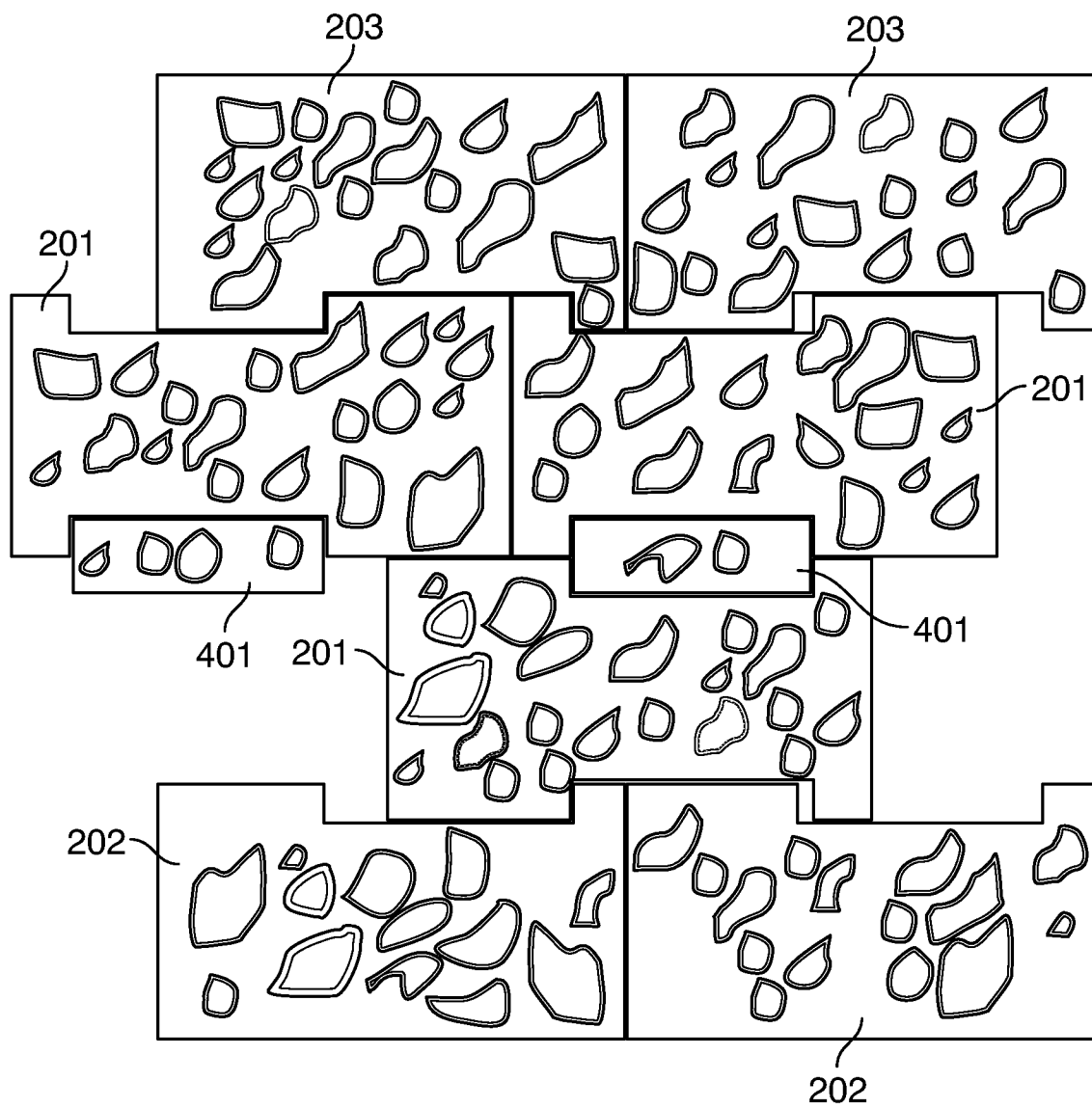


FIG. 6

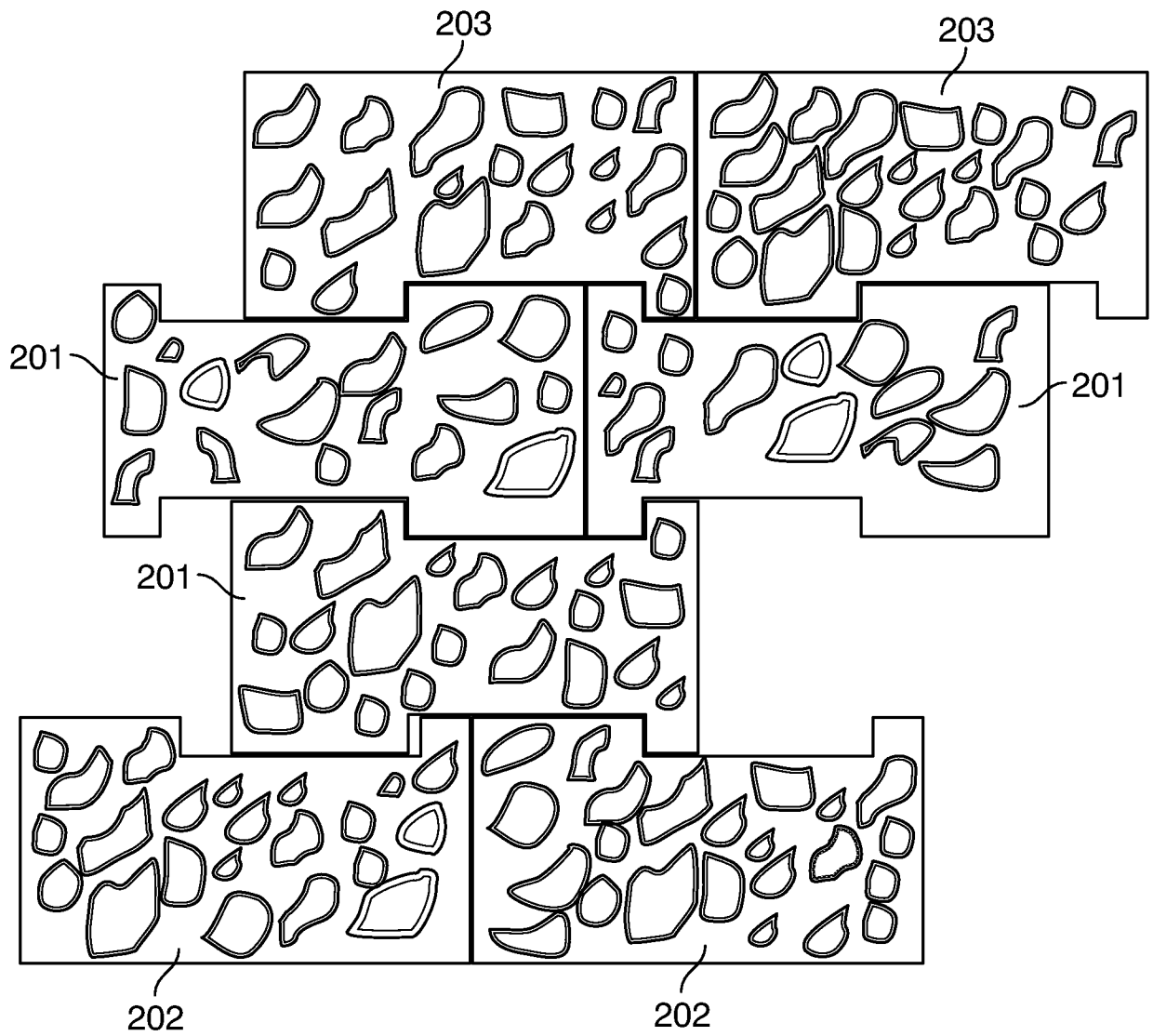


FIG. 7

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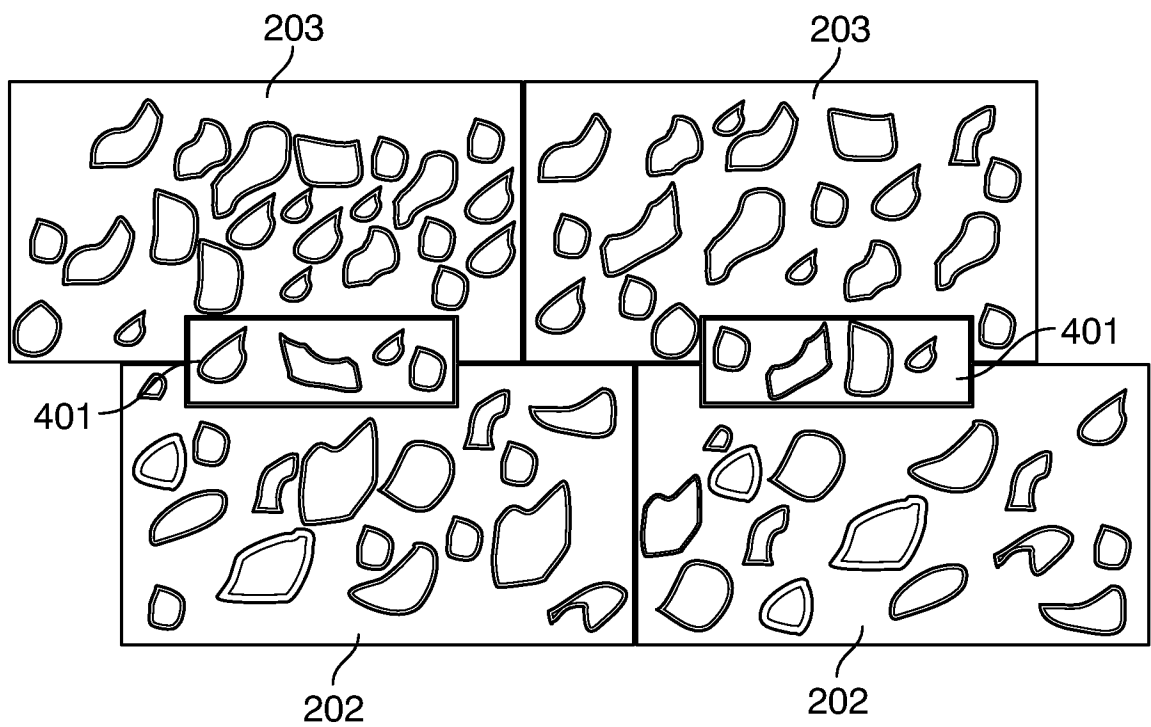


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2018/051188

A. CLASSIFICATION OF SUBJECT MATTER
INV. E04B2/02 E04B2/08
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	FR 2 221 036 A5 (CLUZEL ENTREPRISE [FR]) 4 October 1974 (1974-10-04) figures 1-26 the whole document	1-3, 5-10,12, 13,17
	----- -/-	



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

7 June 2018

Date of mailing of the international search report

18/06/2018

Name and mailing address of the ISA/

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Klein, A

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2018/051188

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	CN 200 975 039 Y (SUN LINZHU [CN]) 14 November 2007 (2007-11-14) figure 93 the whole document -----	1-3, 5-10,12, 13,17

INTERNATIONAL SEARCH REPORT

Information on patent family members

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