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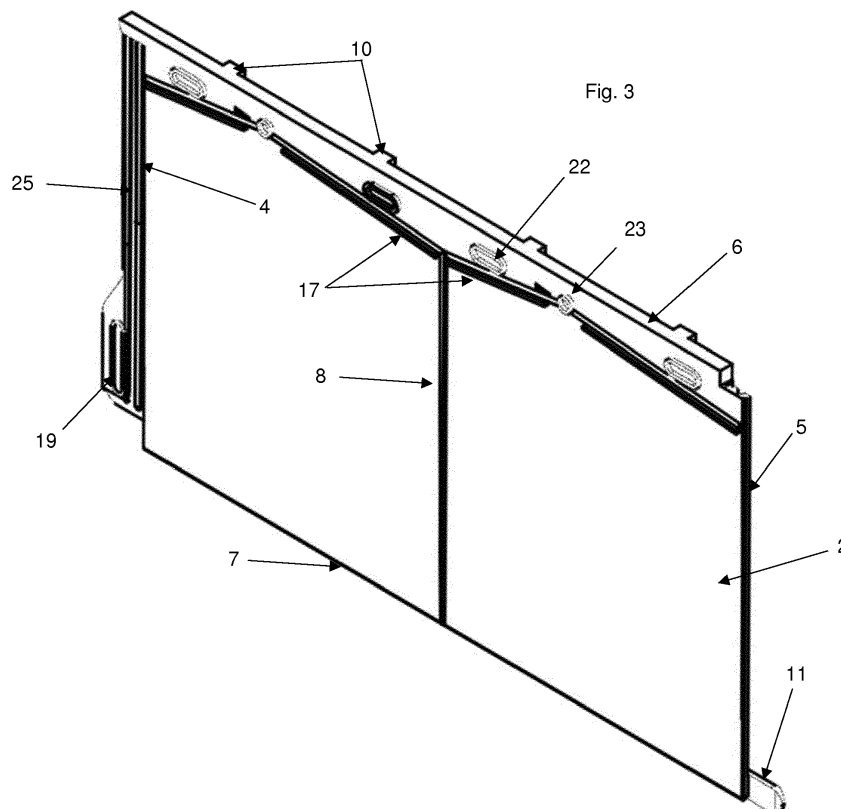
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(54) **A ROOF TILE**

(57) A roof tile (1), comprising; a front section (2); a rear section (3); a first longitudinal edge portion (4) and a second longitudinal edge portion (5) extending between an upper edge portion (6) and a lower edge portion (7),

wherein the roof tile (1) comprises an engagement arrangement (11, 12, 25, 26) for engaging one roof tile with an adjacent roof tile.



Description

[0001] The present invention relates to a roof tile and in particular manufactured from a composite material.

[0002] Typically, clay or concrete tile roof systems are installed over roofing substrates using supportive roof battens. However traditional tiles create a great weight on the building structure requiring a more sturdy and costly construction of the building. Installing traditional tiles is material and labour-intensive and requires hauling and lifting heavy loads of tile pieces and concrete for the setup work and throughout the installation and finishing process. Traditional concrete, clay or terra cotta roof tiles are also easily fractured and broken from the moment the tiles are de-moulded until the time the tile installation is completed. Traditional tiles are subject to deterioration due to the composition of the products and the effect of the elements. This degradation causes tiles to become brittle and routinely fracture and break when basic maintenance is performed.

[0003] Furthermore, most configurations of roof tiles currently available on the market can be prone to leakage, arising from the aforementioned degradation and ease of breakage or the ingress of water from wind-driven rain. Accordingly, current roof tiles fail to sufficiently protect both the underlying roof structure and the house below from warping (of the wooden infrastructure of a roof) and water damage that occurs. From the above it is evident that there is a need for an improved type of roof tile.

[0004] A final problem is that installation of current roof tiles requires permanent fixing one at a time. This method is timely and inefficient. The installer is unable to align more than one tile at a time and therefore must install roof tiles in a stepwise manner. Furthermore, if the installer was to try and align more than one tile at a time to form a row before permanently fixing the tiles they would stand to lose tiles to slippage and breakage making the exercise costlier, inefficient and timely.

Accordingly the present invention provides a roof tile, comprising; a front section; a rear section; a first longitudinal edge portion and a second longitudinal edge portion extending between an upper edge portion and a lower edge portion, wherein the roof tile comprises engagement means for engaging one roof tile with an adjacent roof tile.

Ideally, the engagement means comprises a means for temporarily locating and fixing adjacent tiles together to temporarily prevent the adjacent tiles from separating, the means for temporarily locating and fixing means comprises means for temporarily preventing the lateral and/or longitudinal movement of one or more tiles in situ prior to permanent fixing to the roof baton or other suitable part of the roof structure.

Ideally, the engagement means of the tile comprises at least one overlapping part and at least one underlapping part along the same longitudinal edge portion of the tile. Ideally, the engagement means of the tile comprises both at least one overlapping part and at least one underlap-

ping part along the same longitudinal edge portion of each longitudinal edge portion of the tile.

[0005] Ideally, the overlapping and underlapping part of the longitudinal edge portion of one tile is formed for matingly engaging with the overlapping and underlapping part of the longitudinal edge portion of an adjacent tile in the same row.

[0006] Ideally, the overlapping and underlapping part of the longitudinal edge portion of the engagement means of a first tile corresponds with the underlapping and overlapping part respectively of the longitudinal edge portion of the engagement means of the adjacent tiles in the same row.

[0007] Ideally, a permanent fixing means of a lower row of tiles is alignable and releasably attachable to the temporary locating and fixing means of one or more staggered tiles in an above and overlapping row of tiles.

[0008] Ideally, the engagement means comprises at least one means for temporarily coupling adjacent roof tiles by interference between a male component on one longitudinal edge of one tile and a female component on the opposite longitudinal edge on another tile.

[0009] Ideally, the male component is a male fixing tab and the female component is a female receiving recess, the male fixing tab engages the female receiving recess via an interference fit.

[0010] Ideally, the roof tile comprises one or more fastener access openings along at least one of the upper and/or lower edge portions, and at least one of the longitudinal edge portions. Ideally, the roof tile has one or more water channels on the front section of the tile, the one or more water channels being locatable centrally and/or along either or both longitudinal edge portions of the tile, whereby the longitudinal edge water channels being formed by the creation of a recess between two longitudinal edge portions when adjacent tiles engage.

[0011] Ideally, the roof tile comprises at least one roof baton locating means, the roof baton locating means measuring more than 15mm in depth.

[0012] Ideally, the roof tile comprises a shoulder portion, the shoulder portion being locatable at the top of the longitudinal water channel to prevent the ingress of water being in-driven by wind or any other force.

[0013] Ideally, the rear section of the tile comprises a moulded ribbed imprint, whereby part of the rear section of the tile comprises a moulded ribbed imprint that contributes to the structural integrity of the tile, and part of the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs for collecting wind-blown or other ingressed water.

[0014] Ideally, the width of the tile is approximately twice the width of a standard sized roof tile, the roof tile is a composite roof tile formed from composite materials, and most preferably the roof tile is formed of recycled materials, most ideally recycled plastics.

[0015] Ideally, one roof tile being engaged with an adjacent roof tile to form a tiled surface.

[0016] Ideally, the upper edge portion and a lower edge portion run parallel to the horizontal edges of a sloped roof in situ.

[0017] Ideally, the first and second longitudinal edge portions run parallel to each other.

[0018] Ideally, the first and second longitudinal edge portions run perpendicular to the upper and lower edges of a tile.

[0019] Ideally the engagement means comprises at least one means for temporarily/releasably coupling adjacent roof tiles.

[0020] Ideally, the engagement means comprises at least one means for temporarily/releasably coupling adjacent roof tiles on at least one longitudinal edge of the roof tile.

[0021] Ideally, the engagement means comprises at least one means for temporarily/releasably coupling adjacent roof tiles on each longitudinal edge of the roof tile.

[0022] By temporarily/releasably coupling, we mean that the means for temporarily/releasably coupling adjacent roof tiles has no permanent fixing or fastening mechanically fastening the tile to the roof structure.

[0023] Ideally, the engagement means comprises a means for preventing adjacent roof tiles from separating via longitudinal movement of either or both adjacent roof tiles.

[0024] Ideally, the engagement means comprises a means for preventing adjacent roof tiles from separating via lateral movement of either or both adjacent roof tiles.

[0025] Ideally, the engagement means for preventing adjacent roof tiles from separating via lateral movement has a first part locatable proximal to the lower edge portion of the roof tile.

[0026] Ideally, the first part of the engagement means for preventing adjacent roof tiles from separating via lateral movement comprises a male component and a female component.

[0027] Ideally the location of the male component on one tile corresponds with the location of the female component of an adjacent tile when the two tiles are located side by side to form a row of tiles.

[0028] Preferably, the male component is locatable on one longitudinal edge of the roof tile.

[0029] Ideally, the female component is locatable on the opposing longitudinal edge of the roof tile relative to the male component.

[0030] Preferably, the female component on one tile matingly receives the male component on an adjacent roof tile in a row of tiles to couple adjacent roof tiles to form a tiled surface.

[0031] Ideally, the female component on one tile matingly receives the male component on an adjacent roof tile in a row of tiles to couple adjacent roof tiles to form a tiled surface preventing longitudinal movement between adjacent coupled tiles.

[0032] Ideally, the male component is a male fixing tab.

[0033] Ideally, the female component is a female receiving recess.

[0034] Ideally, the female component is a receiving recess for matingly receiving the fixing tab.

[0035] Ideally, the male fixing tab engages the female receiving recess via an interference fit.

5 **[0036]** Ideally, the tile comprises a means for temporarily locating and fixing adjacent tiles together to temporarily prevent the adjacent tiles from separating and the means for temporarily locating and fixing comprises means for temporarily preventing the lateral movement of one or more tiles arranged in at least one row.

10 **[0037]** Ideally, the one or more temporarily fixed tiles are adjacently arranged to form at least one row.

[0038] Ideally, the one or more temporarily fixed tiles are adjacently arranged to form one or more rows.

15 **[0039]** Ideally, the one or more rows are above or below one another.

[0040] Ideally, the one or more vertically displaced rows overlap.

20 **[0041]** Ideally, the one or more vertically displaced rows partly overlap.

[0042] Ideally, the one or more vertically displaced rows partly overlap whereby the top row of tiles rests on top of/overlies the lower row of tiles.

25 **[0043]** Ideally, the one or more vertically displaced rows partly overlap whereby the lower edge portion of the top row of tiles rests on top of/overlies the upper edge portion of the lower row of tiles.

[0044] Preferably, the male fixing tab protrudes from the tile.

30 **[0045]** Ideally, the male fixing tab protrudes beyond the general shape of the tile.

[0046] Ideally, the male fixing tab protrudes beyond the general quadrilateral shape of the tile.

35 **[0047]** Ideally, the male fixing tab protrudes beyond at least one longitudinal edge portion of the tile.

[0048] Ideally, the male fixing tab protrudes beyond at least one longitudinal edge portion of the tile, proximal to where the at least one longitudinal edge portion of the tile meets one of the upper or lower edge portions.

40 **[0049]** Ideally, the male fixing tab protrudes beyond at least one longitudinal edge portion of the tile, proximal to where the at least one longitudinal edge portion of the tile meets the lower edge portion.

[0050] Preferably, the male fixing tab is recessed.

45 **[0051]** Ideally, the male fixing tab is recessed from the front section of the tile.

[0052] Ideally, the male fixing tab is angularly recessed from the front section of the tile.

50 **[0053]** Ideally, the male fixing tab is recessed from the front section of the tile and is angled upwardly towards the front section of the tile.

[0054] Preferably, the male fixing tab is in the same plane as the rear section of the tile.

55 **[0055]** Ideally the rear face of the male fixing tab is in the same plane as the rear section of the tile.

[0056] Preferably, the male fixing tab is displaced from the main plane of the tile.

[0057] Ideally, the male fixing tab is displaced from the

main plane of the front section of the tile.

[0058] Ideally, the male fixing tab is cranked from the main plane of the tile.

[0059] Ideally, the male fixing tab is cranked from the main plane of the front section of the tile.

[0060] Ideally, the male fixing tab is cranked from the main plane of the tile for forming an interference fit.

[0061] Ideally, the male fixing tab is cranked from the main plane of the tile for forming an interference fit with the female receiving recess of an adjacent tile in a row of tiles.

[0062] Preferably the male fixing tab is of shape that corresponds with the female receiving recess.

[0063] Ideally, the male fixing tab is of shape that corresponds with the female receiving recess for allowing the male fixing tab and the female receiving recess of adjacent tiles in a row of tiles to fit together.

[0064] Ideally, the male fixing tab is of shape that corresponds with the female receiving recess for allowing the male fixing tab and the female receiving recess of adjacent tiles in a row of tiles fit together to interlock.

[0065] Ideally, the male fixing tab is of shape that corresponds with the female receiving recess for allowing the male fixing tab and the female receiving recess of adjacent tiles in a row of tiles fit together to interlock via interference.

[0066] Preferably, the roof tile comprises a protruding wing extending laterally from the lower edge portion proximal to the female receiving recess.

[0067] Preferably, the roof tile comprises a protruding wing extending laterally from the lower edge portion and first longitudinal edge proximal to the female receiving recess.

[0068] Ideally the protruding wing is a narrow flat section.

[0069] Preferably the protruding wing is a narrow flat plate section.

[0070] Ideally, the protruding wing extending laterally from the lower edge is adjacent to and above the female receiving recess.

[0071] Ideally, the protruding wing comprises an aperture.

[0072] Ideally, the protruding wing comprises an aperture for receiving a fastener from the leading end of the tile below to fasten the trailing end of the tile above to the leading end of the tile below.

[0073] Ideally, the protruding wing comprises an elongate aperture for receiving a fastener from the leading end of the tile below to fasten the trailing end of the tile above to the leading end of the tile below.

[0074] Ideally, the protruding wing comprises a vertical/longitudinal oblong aperture for receiving a fastener from the leading end of the tile below to fasten the trailing end of the tile above to the leading end of the tile below.

[0075] Ideally, the protruding wing comprises a vertical/longitudinal oblong shaped aperture for receiving fasteners to fasten the trailing edge of the tile to the leading edge of the tile overlapped below.

[0076] Preferably, the oblong shaped aperture for receiving fasteners to fasten the longitudinal edge of the tile to the leading edge of the tile below is an engagement means on the first longitudinal edge portion of the tile, referred to as the trailing edge portion engagement means.

[0077] Ideally, the trailing edge portion engagement means engages the second longitudinal edge portion of an adjacent tile.

[0078] Ideally, the trailing edge portion engagement means engages engagement means on the second longitudinal edge portion of an adjacent tile.

[0079] The engagement means on the second longitudinal edge portion of an adjacent tile referred to forthwith as the leading edge portion engagement means.

[0080] Ideally, the leading edge portion engagement means is proximal to the top edge of the male fixing tab.

[0081] Ideally, the leading edge portion engagement means is above and laterally inward from the top edge of the male fixing tab.

[0082] Ideally, the leading edge portion engagement means is convex.

[0083] Ideally, the leading edge portion engagement means is convex and engages the trailing edge portion engagement means by protruding into the aperture of the trailing edge portion engagement means.

[0084] Ideally, the leading edge portion engagement means is concave.

[0085] Ideally, the leading edge portion engagement means is concave and engages the trailing edge portion engagement means whereby the lip of the aperture of the trailing edge portion engagement means protrudes into the recess of the leading edge portion engagement means.

[0086] Ideally, the trailing and leading edge portion engagement means engage for locating and fixing adjacent tiles.

[0087] Ideally, the trailing and leading edge portion engagement means engage for temporarily locating and fixing adjacent tiles.

[0088] Preferably the leading edge portion engagement means is convex and the trailing edge portion engagement means is concave.

[0089] Ideally, the trailing and leading edge portion engagement means form at least the means for locating and fixing adjacent tiles to increase resistance to lateral and longitudinal movement.

[0090] Ideally, the trailing and leading edge portion engagement means form at least part of the means for locating and fixing adjacent tiles to increase resistance to lateral and longitudinal movement experienced in the installation process, weather damage, slippage or any other conceivable means that may cause a roof tile to move.

[0091] Ideally, the roof tile comprises an elongate fastener receiving means near the male fixing tab and female receiving recess such that when one tile is interlocked with an adjacent tile the elongate fastener receiving means align with each other to anchor the tile to a

roof baton via the elongate fastener.

[0092] Preferably, the roof tile comprises an oblong shaped fastener receiving means near the male fixing tab and female receiving recess such that when two adjacent tiles are interlocked the oblong shaped fastener receiving means align with each other and the aperture for inserting permanent fixing means to anchor the tile to a roof baton.

[0093] Preferably, the roof tile comprises at least one means for locating and fixing a tile to a roof baton.

[0094] Ideally, the roof tile comprises a means for temporarily locating and fixing a tile to a roof baton.

[0095] Ideally, the roof tile comprises a means for temporarily locating and fixing a tile to a roof baton or any other suitable component of a roof structure.

[0096] The means for locating and fixing a tile to a roof baton will be referred to as a roof baton locating means henceforth.

[0097] Ideally, the roof baton locating means temporarily fixes a tile to a roof baton before permanent fixing can occur.

[0098] Ideally, the roof baton locating means temporarily fixes a tile to a roof baton before permanent fixing with a fastener can occur.

[0099] Ideally, the roof baton locating means comprises a lipped projection.

[0100] Ideally, the roof baton locating means comprises one or more lipped projections.

[0101] Ideally, the roof baton locating means comprises a discontinuous lipped projection.

[0102] Preferably, the roof baton locating means projects from the rear section of the roof tile.

[0103] Ideally, the roof baton locating means projects from the upper edge of the rear section of the roof tile.

[0104] Ideally, the roof baton locating means projects at an angle from the main plane of the tile at the upper edge of the rear section of the roof tile.

[0105] Ideally, the roof baton locating means projects from the main plane of the tile at an angle of up to 90° from the upper edge of the rear section of the roof tile.

[0106] Ideally, the roof baton locating means projects from the main plane of the tile at an 90° angle from the upper edge of the rear section of the roof tile.

[0107] Advantageously, the roof baton locating means overhangs the roof baton more than currently available roof tiles. This is because the lipped projection is larger and projects deeper, down across the face of a roof baton that faces the apex of a pitched roof, than conventional roof tiles currently available to the general market. Lipped projections in current roof tiles are typically 10-15mm in depth whilst the current invention proposes a lipped projection of more than 15mm in depth. By depth we mean the dimension from the most inward point of the moulded imprint of the rear section to the most inward edge of the roof baton locating means relative to a tile in situ. This will provide a more stable and secure temporary location of a tile over a roof baton meaning less movement prior to permanent fastening and reducing the mar-

gin for error in installation.

[0108] Preferably, the roof tile comprises one or more fastener access openings along the upper edge portion of the tile.

5 **[0109]** Ideally, the roof tile comprises one or more fastener receiving openings along at least one of the longitudinal edges.

[0110] Ideally, the roof tile comprises one or more fastener access/receiving openings along the upper edge, and at least one of the longitudinal edges.

10 **[0111]** Ideally, the roof tile comprises one or more fastener access/receiving openings along the upper edge, and at the first longitudinal edge.

[0112] Ideally, at least one of the one or more fastener access openings is elongate.

15 **[0113]** Ideally, at least one of the one or more fastener access/receiving openings along the upper edge portion of the tile is elongate.

20 **[0114]** Ideally, at least one of the one or more fastener access/receiving openings along the longitudinal edge is elongate.

[0115] Ideally, at least one of the one or more fastener access openings is round.

25 **[0116]** Ideally, at least one or more of the fastener access openings along the upper edge portion of the tile are round.

[0117] Ideally, at least one of the one or more fastener access openings along the longitudinal edge is round.

30 **[0118]** Ideally, the one or more of the fastener access/receiving openings along the upper edge portion of the tile are a combination of round and elongate fastener access openings.

[0119] Ideally, the roof tile comprises one or more elongate fastener access openings along the upper edge portion of the tile through which a fastener can be passed.

35 **[0120]** Ideally, the roof tile comprises one or more elongate fastener access openings along the upper edge portion of the tile through which a fastener can be passed to anchor the tile to the roof framework or baton.

40 **[0121]** Ideally, the roof tile comprises one or more horizontal oblong fastener access openings along the upper edge portion of the tile through which a fastener can be passed to anchor the tile to the roof framework or baton.

45 **[0122]** Advantageously, when fitting conventional roof tiles to a wooden roofing frame problems can sometimes occur when trying to fix conventional tiles to the wooden frame or batons and a knot in the wood is encountered. Typically tiles have single nail holes and when the nail cannot be hammered in the integrity of the roofing is compromised. The tile of the present invention overcomes this problem by providing elongated slots or openings so that a fixing nail can be hammered in anywhere along the slot thereby avoiding any knots in the wood.

50 **[0123]** Preferably, the roof tile comprises at least one water channel.

[0124] Ideally, the roof tile comprises one or more water channels.

[0125] Ideally, the at least one water channel is inclined

so that water runs predominantly in a direction from the upper edge of the tile to the bottom edge of the tile.

[0126] Ideally, the at least one or more water channels is inclined so that water runs predominantly in a direction from the upper edge of the tile to the bottom edge of the tile.

[0127] Ideally, the at least one water channel runs at an inclined angle in situ from the upper edge of the tile to the bottom edge of the tile.

[0128] Ideally, the one or more water channels run at an inclined angle in situ from the upper edge of the tile to the bottom edge of the tile.

[0129] Ideally, the at least one water channel is located on the front section of the tile.

[0130] Ideally, the one or more water channels are located on the front section of the tile.

[0131] Ideally the at least one water channel is located along the central longitudinal axis of the front section of the roof tile.

[0132] Ideally the one or more water channels are located along the central longitudinal axis of the front section of the roof tile.

[0133] Ideally the one or more water channels are located along the first longitudinal edge of the front section of the roof tile.

[0134] Ideally the one or more water channels are located along the second longitudinal edge of the front section of the roof tile.

[0135] Ideally the one or more water channels are located along one or all or any combination thereof of the central longitudinal axis, the first longitudinal edge and/or the second longitudinal edge of the front section of the roof tile.

[0136] Preferably, the one or more water channels are interconnectedly linked along the top portion of the front section of the tile by inclined water channels.

[0137] Advantageously, the inclined water channels guide the water to the longitudinal water channels, which in turn guide wind-blown or any other ingressed water down, i.e. water that is travelling against the incline of the pitch of a pitched roof or any other direction that causes it to move between vertically displaced rows of roof tiles on a tiled roof, away from the roof structure and/or any infrastructure prone to water damage that underlies the tiles.

[0138] Ideally, the longitudinal edge water channels being formed when the first longitudinal edge of the leading tile engages with the second longitudinal edge of the trailing tile.

[0139] Ideally, the longitudinal edge water channels being formed when the first longitudinal edge of the leading tile abuts with the second longitudinal edge of the trailing tile.

[0140] Ideally, the longitudinal edge water channels being formed by the recess created when the first longitudinal edge of the leading tile abuts with the second longitudinal edge of the trailing tile.

[0141] Ideally, the longitudinal edge water channels

being formed when adjacent tiles abut.

[0142] Ideally, the longitudinal edge water channels being formed by the creation of a recess when adjacent tiles abut.

[0143] Ideally, the longitudinal edge water channels being formed by the creation of a recess between two longitudinal edges when adjacent tiles engage.

[0144] Ideally, the longitudinal edge water channels being formed when adjacent tiles engage via engaging means.

[0145] Ideally, the longitudinal edge water channels being formed when the first longitudinal edge of one tile engages with the second longitudinal edge of another tile via engaging means.

[0146] Ideally, the longitudinal edge water channels are formed when the first longitudinal edge of the leading tile engages with the second longitudinal edge of the trailing tile via engaging means.

[0147] Ideally, the longitudinal edge water channels are formed when the first longitudinal edge of the leading tile engages with the second longitudinal edge of the trailing tile via longitudinal edge engaging means.

[0148] Ideally, the longitudinal edge water channels are formed on the front section of a tile when the first longitudinal edge of the leading tile engages with the second longitudinal edge of the trailing tile via longitudinal edge portion engaging means.

[0149] Ideally, the longitudinal edge water channels are formed on the front section of two adjacent tiles when the first longitudinal edge of the leading tile engages with the second longitudinal edge of the trailing tile via longitudinal edge portion engaging means.

[0150] Preferably, the longitudinal edge portion engaging means comprises a first longitudinal edge portion engaging means and a second longitudinal edge portion engaging means.

[0151] Ideally, the first longitudinal edge portion engaging means comprises an elongate portion between the first longitudinal edge of the tile and the trailing edge portion engagement means.

[0152] Ideally, the first longitudinal edge engaging means comprises an elongate portion between the first longitudinal edge of the front section of the tile and the trailing edge portion engagement means.

[0153] Ideally, the first longitudinal edge portion engaging means comprises an elongate portion between the first longitudinal edge of the front section of the tile and the trailing edge portion engagement means and runs the length of the tile from where the shoulder portion of the first longitudinal edge stops and the female receiving recess of the second longitudinal edge begins

[0154] Ideally, the first longitudinal edge portion engaging means comprises an elongate channel extending along the majority of the length of the first longitudinal edge of the front section.

[0155] Ideally, the first longitudinal edge portion engaging means comprises an elongate contoured channel between the first longitudinal edge of the front section of

the tile and the trailing edge portion engagement means.

[0156] Ideally, the first longitudinal edge portion engaging means comprises an elongate oscillating contoured channel extending along the majority of the length of the first longitudinal edge of the front section.

[0157] Ideally, the first longitudinal edge portion engaging means comprises an elongate oscillating contoured channel extending along the majority of the length of the first longitudinal edge of the front section.

[0158] Ideally, the first longitudinal edge portion engaging means is recessed from the front section of the tile.

[0159] Ideally, the first longitudinal edge portion engaging means runs the length of the tile from where the shoulder portion of the first longitudinal edge stops and the female receiving recess of the second longitudinal edge begins.

[0160] Ideally, the second longitudinal edge engaging means comprises an elongate portion extending along the majority of the length of the second longitudinal edge of the tile.

[0161] Ideally, the second longitudinal edge engaging means comprises an elongate portion extending along the majority of the length of the second longitudinal edge of the tile.

[0162] Ideally, the second longitudinal edge engaging means comprises an elongate channel extending along the majority of the length of the second longitudinal edge of the tile.

[0163] Ideally, the second longitudinal edge engaging means comprises an elongate contoured channel extending along the majority of the length of the second longitudinal edge of the tile.

[0164] Ideally, the second longitudinal edge engaging means comprises an elongate oscillating contoured channel extending along the majority of the length of the second longitudinal edge of the tile.

[0165] Ideally, the second longitudinal edge engaging means is recessed from the rear section of the tile.

[0166] Ideally, the second longitudinal edge engaging means runs the length of the tile from where the male fixing tab of the second longitudinal edge stops and the recess for receiving the shoulder portion of the first longitudinal edge begins

[0167] Ideally, the first longitudinal edge engaging means corresponds with the second longitudinal edge engaging means.

[0168] Ideally, the first longitudinal edge engaging means corresponds and engages with the second longitudinal edge engaging means.

[0169] Ideally, the first longitudinal edge engaging means corresponds and engages with the second longitudinal edge engaging means via interference.

[0170] Advantageously, the longitudinal engaging means is another form of temporary locating and fixing means that guards against lateral movement of the tiles during installation, prior to permanent fixing and/or fastening.

[0171] Preferably, the roof tile comprises a shoulder portion.

[0172] Ideally, the roof tile comprises a shoulder portion located on the upper edge of the tile.

5 **[0173]** Ideally, the roof tile comprises a shoulder portion located on the front section at the upper edge of the tile.

10 **[0174]** Ideally, the roof tile comprises a shoulder portion located on the front section at the upper edge of the tile between the first longitudinal edge of the front section and the outermost longitudinal edge of the first longitudinal edge portion engagement means.

[0175] Ideally, the shoulder portion on corresponds to a shoulder recess on an adjacent tile.

15 **[0176]** Ideally, the shoulder portion on the trailing upper edge of the tile corresponds to a shoulder recess on the leading upper edge of an adjacent tile.

[0177] Ideally, the shoulder portion being locatable at the top of the longitudinal water channel.

20 **[0178]** Ideally, the shoulder portion being locatable at the top of the longitudinal water channel to prevent the ingress of water.

25 **[0179]** Ideally, the shoulder portion being locatable at the top of the longitudinal water channel to prevent the ingress of water being in-driven by wind or any other force.

[0180] Ideally, the shoulder portion being locatable at the top of the longitudinal water channel to prevent the ingress of water into the overlying row of tiles above.

30 **[0181]** Advantageously, not only does the shoulder portion provide further locating and fixing stability between adjacent tiles during installation, but it also prevents water in the longitudinal water channel traversing the desired direction of flow and getting into the underside of the overlying row of tiles above and subsequently the roof structure and batons. Thus, it further reduces the potential for water damage to any part of the underlying roof and/or building structure.

35 **[0182]** Preferably, the rear section of the roof tile comprises a moulded ribbed imprint. Ideally, rear section of the roof tile comprises a geometric moulded ribbed imprint.

40 **[0183]** Ideally, the rear section of the tile comprises a moulded ribbed imprint that contributes to the structural integrity of the tile.

45 **[0184]** Ideally, the rear section of the tile comprises a geometric moulded ribbed imprint that contributes to the structural integrity of the tile.

50 **[0185]** Ideally, part of the rear section of the tile comprises a moulded ribbed imprint that contributes to the structural integrity of the tile.

[0186] Ideally, part of the rear section of the tile comprises a moulded ribbed imprint that contributes to the structural integrity of the tile.

55 **[0187]** Ideally, part of the rear section of the tile comprises a geometric moulded ribbed imprint that contributes to the structural integrity of the tile.

[0188] Ideally, approximately the top two thirds of the

rear section of the tile comprises a geometric moulded ribbed imprint that contributes to the structural integrity of the tile.

[0189] Ideally, the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter.

[0190] Ideally, part of the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter.

[0191] Ideally, the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs.

[0192] Ideally, part of the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs.

[0193] Ideally, the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs for collecting wind-blown or other ingressed water.

[0194] Ideally, part of the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs for collecting wind-blown or other ingressed water.

[0195] Ideally, the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs for collecting wind-blown or other ingressed water and guides it to the water channels of at least one other tile.

[0196] Ideally, the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs for collecting wind-blown or other ingressed water and guides it to the water channels of one or more adjacent tiles.

[0197] Ideally, the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs for collecting wind-blown or other ingressed water and guides it to the water channels of at least one underlying tile below.

[0198] Ideally, part of the rear section of the tile comprises the at least one largely flat portion with a moulded ribbed perimeter.

[0199] Ideally, approximately the top third of the rear section of the tile comprises the at least one largely flat portion with a moulded ribbed perimeter.

[0200] Preferably, the width of the tile is approximately twice the width of a standard sized roof tile.

[0201] Preferably, the roof tile is a composite roof tile formed from composite materials.

[0202] Ideally, the roof tile is formed of recycled materials, most ideally recycled plastics.

[0203] Preferably the engagement means of the roof tile comprises at least one overlapping part.

[0204] Preferably the engagement means of the roof tile comprises at least one underlapping part.

[0205] Preferably, the engagement means of the tile comprises at least one overlapping part and at least one

underlapping part.

[0206] Preferably, the engagement means of the tile comprises at least one overlapping part and at least one underlapping part along the same longitudinal edge portion.

[0207] Preferably, the engagement means of the tile comprises both at least one overlapping part and at least one underlapping part along the same longitudinal edge portion of each longitudinal edge portion.

[0208] Ideally, the overlapping part of the longitudinal edge of one tile is formed for matingly engaging with the underlapping part of the longitudinal edge of an adjacent tile in the same row.

[0209] Ideally, the overlapping and underlapping part of the longitudinal edge portion of one tile is formed for matingly engaging with the overlapping and underlapping part of the longitudinal edge portion of an adjacent tile in the same row.

[0210] Ideally, the overlapping and underlapping part of the longitudinal edge portion of the first tile is staggered with the underlapping and overlapping part of the longitudinal edge portion of the adjacent tiles in the same row.

[0211] Ideally, the overlapping part of the first tile is in alignment with and overlaps the underlapping part of the adjacent tile and the underlapping part of the first tile is aligned with and underlies the overlapping part of the second tile.

[0212] Ideally, the permanent fixing means of a lower row of tiles is alignable and releasably attachable to the locating and fixing means of at least one staggered tile in an above and overlapping row of tiles.

[0213] Ideally, the permanent fixing means of a lower row of tiles is alignable and releasably attachable to the locating and fixing means of one or more staggered tiles in an above and overlapping row of tiles. Ideally the at least one underlapping part of the engagement means comprises the male fixing tab.

[0214] Ideally the at least one underlapping part of the engagement means comprises the first longitudinal edge portion engagement means.

[0215] Ideally the at least one underlapping part of the engagement means comprises the trailing edge portion engagement means.

[0216] Ideally the at least one underlapping part of the engagement means comprises at least one of the male fixing tab, the trailing edge portion engagement means or the first longitudinal edge portion engagement means.

[0217] Ideally the at least one underlapping part of the engagement means comprises at least one or more of the male fixing tab, the trailing edge portion engagement means or the first longitudinal edge portion engagement means.

[0218] Ideally the at least one underlapping part of the engagement means comprises at least one or any combination of the male fixing tab, the trailing edge portion engagement means or the first longitudinal edge portion engagement means.

[0219] Ideally the at least one overlapping part of the

engagement means comprises the female receiving recess.

[0220] Ideally the at least one overlapping part of the engagement means comprises the second longitudinal edge portion engagement means.

[0221] Ideally the at least one underlapping part of the engagement means comprises the leading edge portion engagement means.

[0222] Ideally the at least one underlapping part of the engagement means comprises one or more of the female receiving recess, the leading edge portion engagement means or the second longitudinal edge portion engagement means.

[0223] Ideally the at least one underlapping part of the engagement means comprises at least one of the female receiving recess, the leading edge portion engagement means or the second longitudinal edge portion engagement means.

[0224] Ideally the at least one underlapping part of the engagement means comprises at least one or any combination of the male fixing tab, the trailing edge portion engagement means or the first longitudinal edge portion engagement means.

[0225] The skilled man will appreciate that all preferred or optional features of the invention described with reference to only some aspects or embodiments of the invention may be applied to all aspects of the invention.

[0226] It will be appreciated that optional features applicable to one aspect of the invention can be used in any combination, and in any number. Moreover, they can also be used with any of the other aspects of the invention in any combination and in any number. This includes, but is not limited to, the dependent claims from any claim being used as dependent claims for any other claim in the claims of this application.

[0227] The invention will now be described with reference to the accompanying drawings which shows by way of example only one embodiment of the roof tile in accordance with the invention.

Figure. 1 is a plan view from the front of the roof tile of the invention, (a) is a side view and (b) is a view from the top;

Figure. 2 is a plan view from the rear of the roof tile of the invention, (a) is a view from the top;

Figure. 3 is side perspective view from the front of the roof tile of Fig. 1;

Figure. 4 is side perspective view from the rear of the roof tile of Fig. 1; and

Figure. 5 is a plan view of a number of roof tiles of the invention joined together;

Figure. 6(a) is a cross sectional view along the line C-C (b) is a cross sectional view along the line A-A and (c) is a cross sectional view along the line B-B.

[0228] When fitting roof tiles to a wooden roofing frame problems can sometimes occur when trying to fix the tiles to the wooden frame or batons and a knot in the wood is

encountered. Typically tiles have single nail holes and when the nail isn't hammered in properly the integrity of the roofing can be compromised. The tile of the present invention overcomes this problem by providing elongated slots or openings so that a fixing nail can be hammered in anywhere along the slot thereby avoiding any knots in the wood and ensuring the tile is secured properly to the wooden frame or batons.

[0229] The tile 1 comprises a front section 2, a rear section 3, first 4 and second 5 longitudinal edges adapted to extend in the slope direction of a sloped roof and an upper edge 6 and a lower edge 7 adapted to run parallel to the horizontal edges of a sloped roof. The tile has a central rib and/or water run off channel 8 running vertically down the centre of the front section 2. The tile 1 is a composite tile and the central rib 8 gives the effect in situ of two tiles rather than a single composite tile.

[0230] The rear section 3 of the tile has a moulded ribbed cavity imprint or design 9 which adds to the structural integrity of the tile 1. Approximately two thirds of the surface of the rear section has a geometric ribbed design 9 and the lower third has two largely flat profile portions separated with a ribbed perimeter 10. The lower third of the rear surface 3 is essentially smooth. This is the trailing end of the tile 1 which would overlie the leading end on a lower course or row of tiles. It acts to stop any in-blown water from progressing too far up between the adjacent overlapping rows of tiles, with the ribbed perimeter creating a reservoir that collects said water and guides it into the water channels 8, 14 of the tile 1 in the underlying rows.

[0231] The upper edge 6 or leading end of the rear section 3 of the tile 1 comprises a number of spaced apart projecting fixing nibs or lugs 10. These fixing nibs 10 hook over the roofing battens and hold the tiles in place. The fixing nibs 10 are larger and deeper than on conventional tiles to provide a better and more secure grip on the batons or wooden roofing frame.

[0232] The tile has a male fixing tab 11 protruding proximal to the lower edge of the second longitudinal edge 5 and a female receiving recess 12 on the opposite side of the tile along the lower edge of the first longitudinal edge 4 so that adjacent tiles can be interlocked with one another to form a continuous tiled surface. The male fixing tab 11 is angled upwardly from the rear section of the tile towards the front section to tightly fit securely within the female receiving recess 12.

[0233] The interlocking of the tiles in this way prevents wind lift damaging the tile or roofing structure as the tile is locked down.

[0234] The tile 1 has longitudinal engagement means that comprises first longitudinal engagement means 25 along the first longitudinal edge 4 of a leading tile 1, that interferes with the second longitudinal engagement means 26 that lie along the second longitudinal edge 5 of a trailing tile. When the respective longitudinal engagement means are engaged the two adjacent tiles 1 abut along the first and second longitudinal edges 4,5 of the

front section 2 to form a groove/recess along the join of the respective front sections 2. This groove/recess acts as the longitudinal water channel 14.

[0235] While the tiles are tightly interlocked with one another any rain or moisture that does manage to penetrate the gap between the coupled tiles is gathered in the longitudinal water channels 14. The upper end of the channel 14 on the front section 2 has a shoulder 16 to prevent any ingress of wind driven rain when the tiles are interlocked.

[0236] Where wind does manage to ingress into the underside of tiles in the rows above, the reservoir portion 27 of the rear section 3 prevents water from travelling up the entirety of the rear section 3, collecting and guiding water back to the angled water channels 17 and/or the vertical water channels 8, 14.

[0237] The leading end of the front section 2 of the tile has a number of angled run off channels 17. When the tiles are laid on a roof the leading end of the tile 1 is overlapped by a higher course of tiles. The angled run off channels 17 are not visible on a finished roof. The angled run off channels 17 collect and direct any moisture that may form into the run off channel 14.

[0238] The tile 1 has a protruding wing 18 which extends laterally outwardly from the lower end 7 of the first longitudinal edge 4. The protruding wing 18 has a vertical oblong aperture 19 that interacts with the head of a fastener inserted into the fastener aperture 23,24 of an underlying tile anchoring the protruding wing 18 to the underlying tile. When an adjacent tile is coupled to the overlying tile the protruding wing 18 interlocks with a corresponding recess 20 on the lower end of the second longitudinal edge 5 of the adjacent tile. The oblong opening 19 aligns and fits within an oblong recess 21 within the recess 20 to fasten and clip the adjacent tiles to each other and the underlying tile, forming a tri-partite coupling between three tiles. This serves to strengthen the resistance to slippage and elemental damage.

[0239] A third oblong fastening recess 24 is located in the centre of trailing end of the tile 1. Accordingly, it too interacts with the head of a fastener inserted into the fastener aperture 23,24 of an underlying tile anchoring the lower central portion of the tile to the underlying tile.

[0240] Furthermore, both the longitudinal engagement means prevents lateral movement when installing the tiles as the second longitudinal engagement means 25 overlaps the first longitudinal engagement means 25, helping to accurately locate and fix the tiles within their desired rows prior to permanent fixing and/or fastening.

[0241] The tile 1 has a number of elongate horizontal slots or openings 22 along the upper section 6 of the tile 1. The elongated openings 22 provide a flexible fixing means when nailing the tile 1 to a wooden roofing frame or baton. A nail can be fixed anywhere along the length of the elongated opening 22 and is not limited to a single nail hole. Encountering a knot in the wooden roofing frame is no longer a problem as a nail can be hammered in anywhere along the horizontal opening 22.

[0242] The tile 1 has two fastening holes 23 along the upper edge 6 of the tile 1 for receiving fasteners. When laying roof tiles, a row or course of tiles are laid adjacent to one another and interlocked with the male fixing tab 11 on one longitudinal edge interlocking with the female receiving recess 12 on the longitudinal edge of an adjacent tile (Fig. 5). The trailing end of the second row or course of tiles is overlaid on a lower course of tiles. The vertical oblong recesses 21 and 24 on the trailing end of the upper tile 1 are aligned with the fastening holes 23 on the leading end on the lower course of tiles. In this way fasteners attached to the fastening holes 23 are used to anchor oblong aperture 19 and recesses 21, 24 to the top of the heads of the fasteners as described above.

[0243] A roof is covered with tiles of the present invention by first laying and interlocking a course of tiles side by side to form a continuous row of tile. The tiles are fixed to a wooden framework or batons by first hooking the fixing nibs 10 onto the batons and then hammering nails through the horizontal slots 22 to fix the tiles in position. Once a course of tiles has been laid a second course is laid and the degree of overlap of each course is shown in Fig. 5. The vertical oblong openings 21, 24 on the trailing end of the upper tile is aligned to engage with the fastening holes 23 on the leading end of each on the lower course of tiles.

[0244] The tiles of the invention are securely interlocked to one another by means of mating engagement of the male fixing tab and female recess. The fasteners in the fastening holes 23 engage and fasten with the oblong opening 21, 24 clipping the tiles securely together. The invention is not limited to the embodiment hereinbefore described, with reference to the accompanying drawings, which may be varied in construction and detail.

Claims

1. A roof tile, comprising; a front section; a rear section; a first longitudinal edge portion and a second longitudinal edge portion extending between an upper edge portion and a lower edge portion, wherein the roof tile comprises engagement means for engaging one roof tile with an adjacent roof tile.
2. A roof tile as claimed in claim 1 wherein the engagement means comprises a means for temporarily locating and fixing adjacent tiles together to temporarily prevent the adjacent tiles from separating, the means for temporarily locating and fixing means comprises means for temporarily preventing the lateral and/or longitudinal movement of one or more tiles in situ prior to permanent fixing to the roof baton or other suitable part of the roof structure.
3. A roof tile as claimed in claim 1 or 2 wherein the engagement means of the tile comprises at least one overlapping part and at least one underlapping part

along the same longitudinal edge portion of the tile.

4. A roof tile as claimed in claim 3 wherein the engagement means of the tile comprises both at least one overlapping part and at least one underlapping part along the same longitudinal edge portion of each longitudinal edge portion of the tile. 5
5. A roof tile as claimed in any one of claims 3 or 4 wherein the overlapping and underlapping part of the longitudinal edge portion of one tile is formed for matingly engaging with the overlapping and underlapping part of the longitudinal edge portion of an adjacent tile in the same row. 10
6. A roof tile as claimed in any one of claims 3 to 5 wherein the overlapping and underlapping part of the longitudinal edge portion of the engagement means of a first tile corresponds with the underlapping and overlapping part respectively of the longitudinal edge portion of the engagement means of the adjacent tiles in the same row. 15
7. A roof tile as claimed in claim 2 or any one of claims 3 to 6 whereby a permanent fixing means of a lower row of tiles is alignable and releasably attachable to the temporary locating and fixing means of one or more staggered tiles in an above and overlapping row of tiles. 20
8. A roof tile as claimed in any of the preceding claims wherein the engagement means comprises at least one means for temporarily coupling adjacent roof tiles by interference between a male component on one longitudinal edge of one tile and a female component on the opposite longitudinal edge on another tile. 25
9. A roof tile as claimed in claim 9 wherein the male component is a male fixing tab and the female component is a female receiving recess, the male fixing tab engages the female receiving recess via an interference fit. 30
10. A roof tile as claimed in any preceding claim wherein the roof tile comprises one or more fastener access openings along at least one of the upper and/or lower edge portions, and at least one of the longitudinal edge portions. 35
11. A roof tile as claimed in any of the preceding claims wherein the roof tile has one or more water channels on the front section of the tile, the one or more water channels being locatable centrally and/or along either or both longitudinal edge portions of the tile, whereby the longitudinal edge water channels being formed by the creation of a recess between two longitudinal edge portions when adjacent tiles engage. 40

12. A roof tile as claimed in any preceding claim wherein the roof tile comprises at least one roof baton locating means, the roof baton locating means measuring more than 15mm in depth. 45

13. A roof tile as claimed in any preceding claim wherein the roof tile comprises a shoulder portion, the shoulder portion being locatable at the top of the longitudinal water channel to prevent the ingress of water being in-driven by wind or any other force. 50

14. A roof tile as in any of the preceding claims wherein the rear section of the tile comprises a moulded ribbed imprint, whereby part of the rear section of the tile comprises a moulded ribbed imprint that contributes to the structural integrity of the tile, and part of the rear section of the tile comprises at least one largely flat portion with a moulded ribbed perimeter that acts as one or more water reservoirs for collecting wind-blown or other ingressed water. 55

15. A roof tile as in any of the preceding claims wherein the width of the tile is approximately twice the width of a standard sized roof tile, the roof tile is a composite roof tile formed from composite materials, and most preferably the roof tile is formed of recycled materials, most ideally recycled plastics.

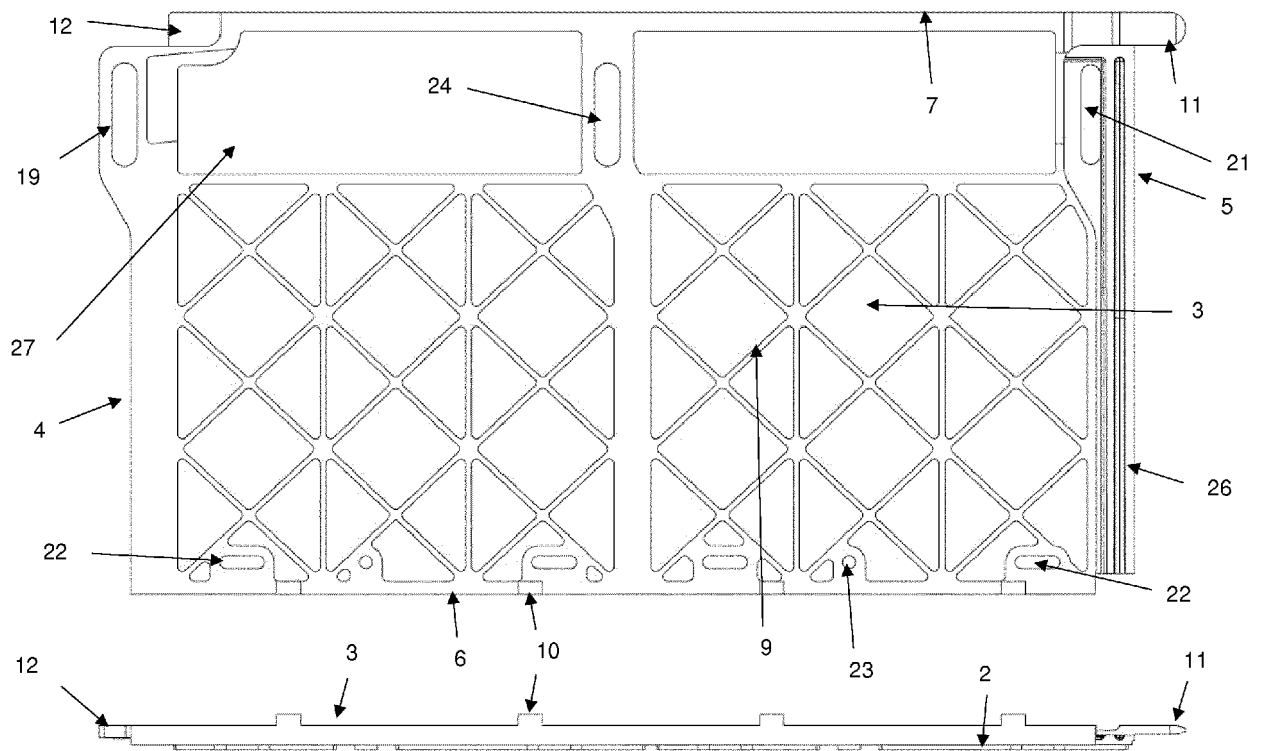
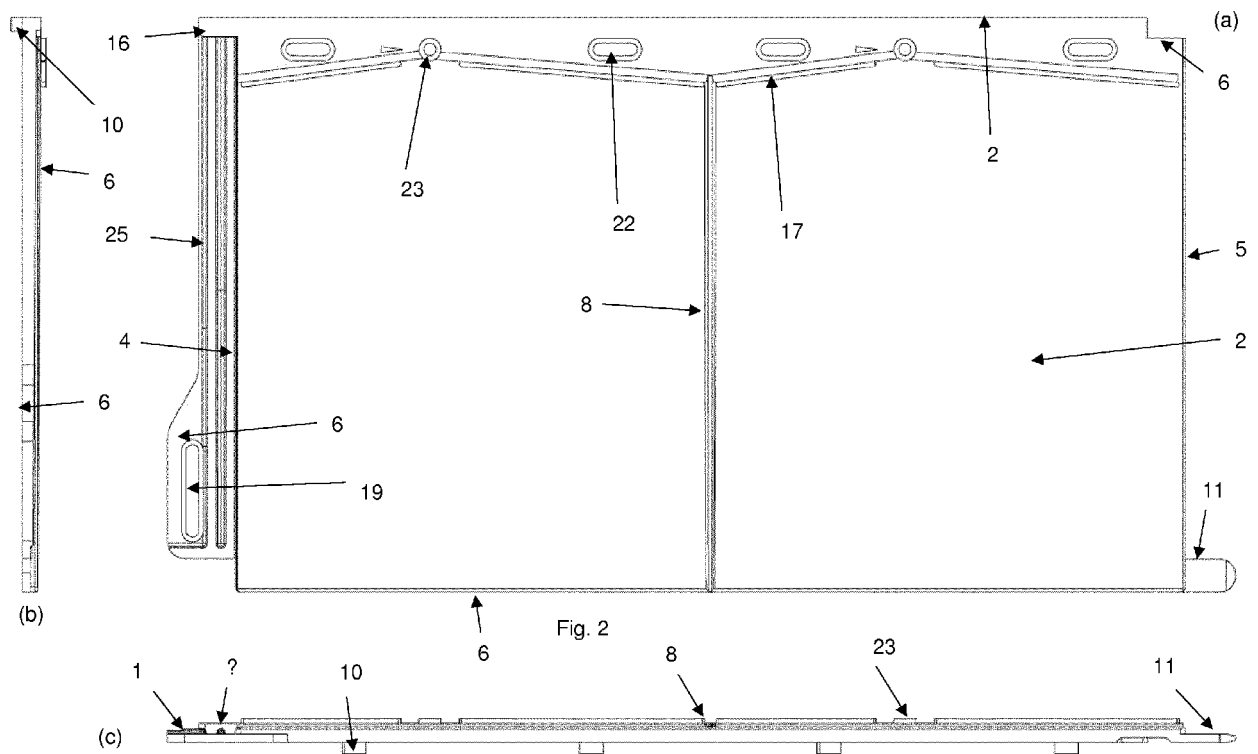
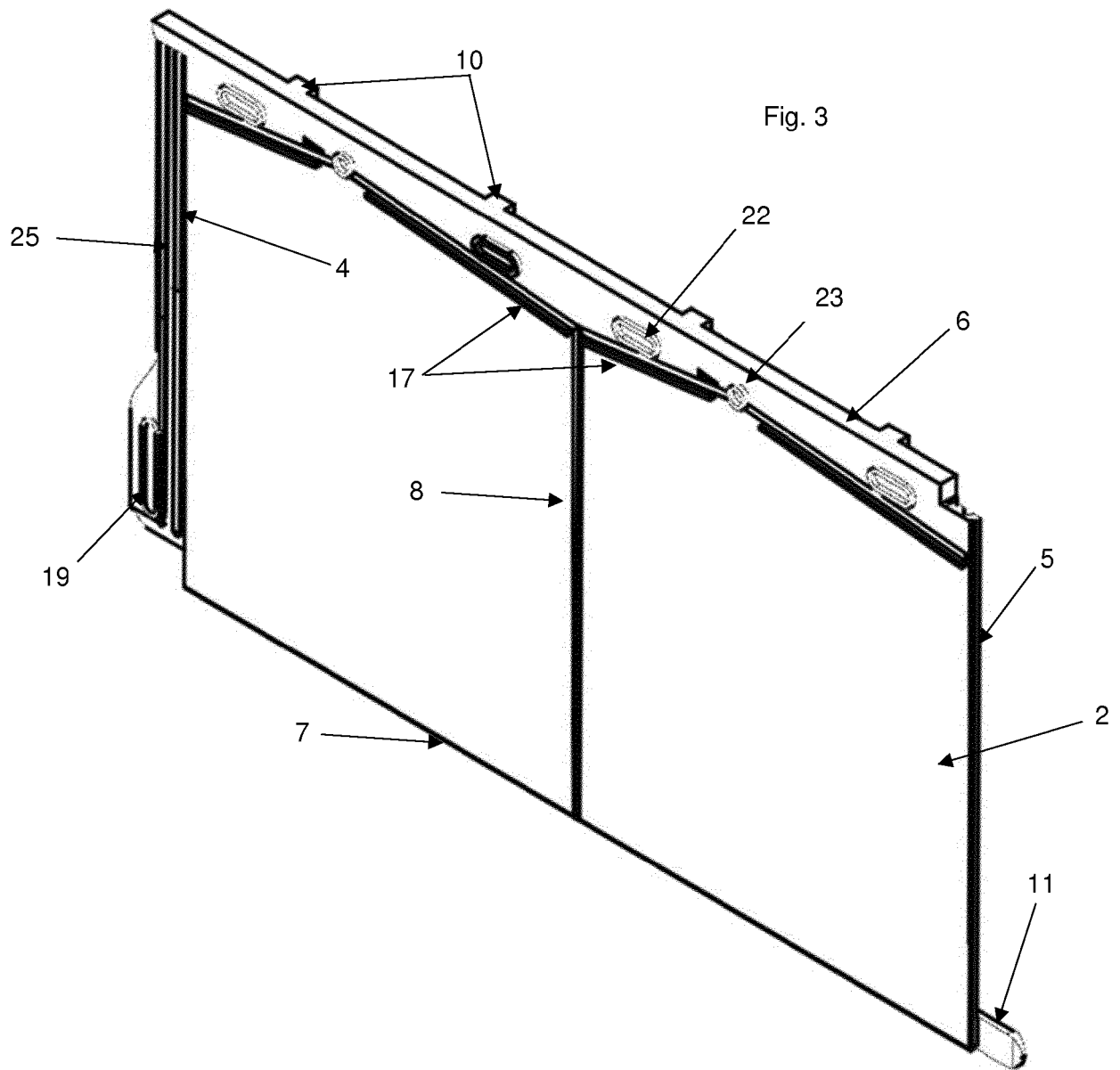


Fig. 1





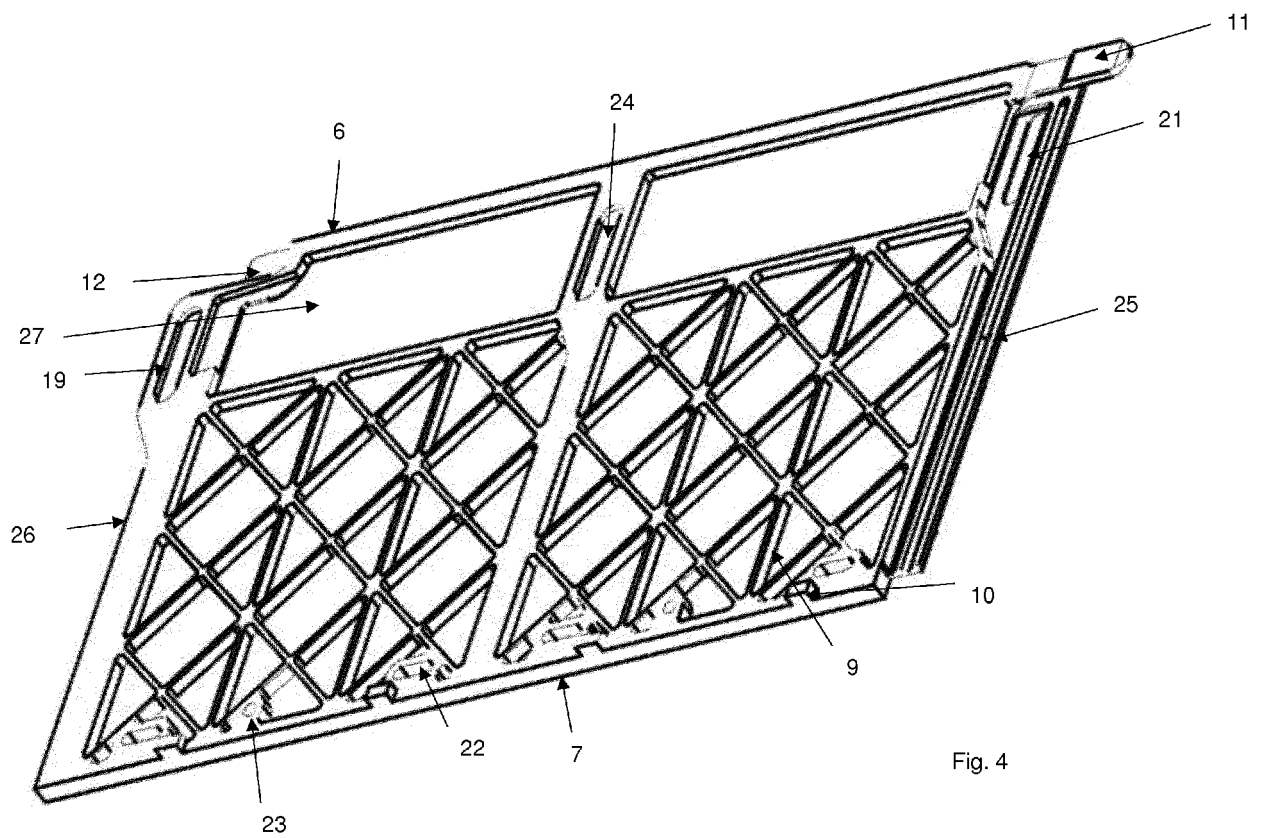
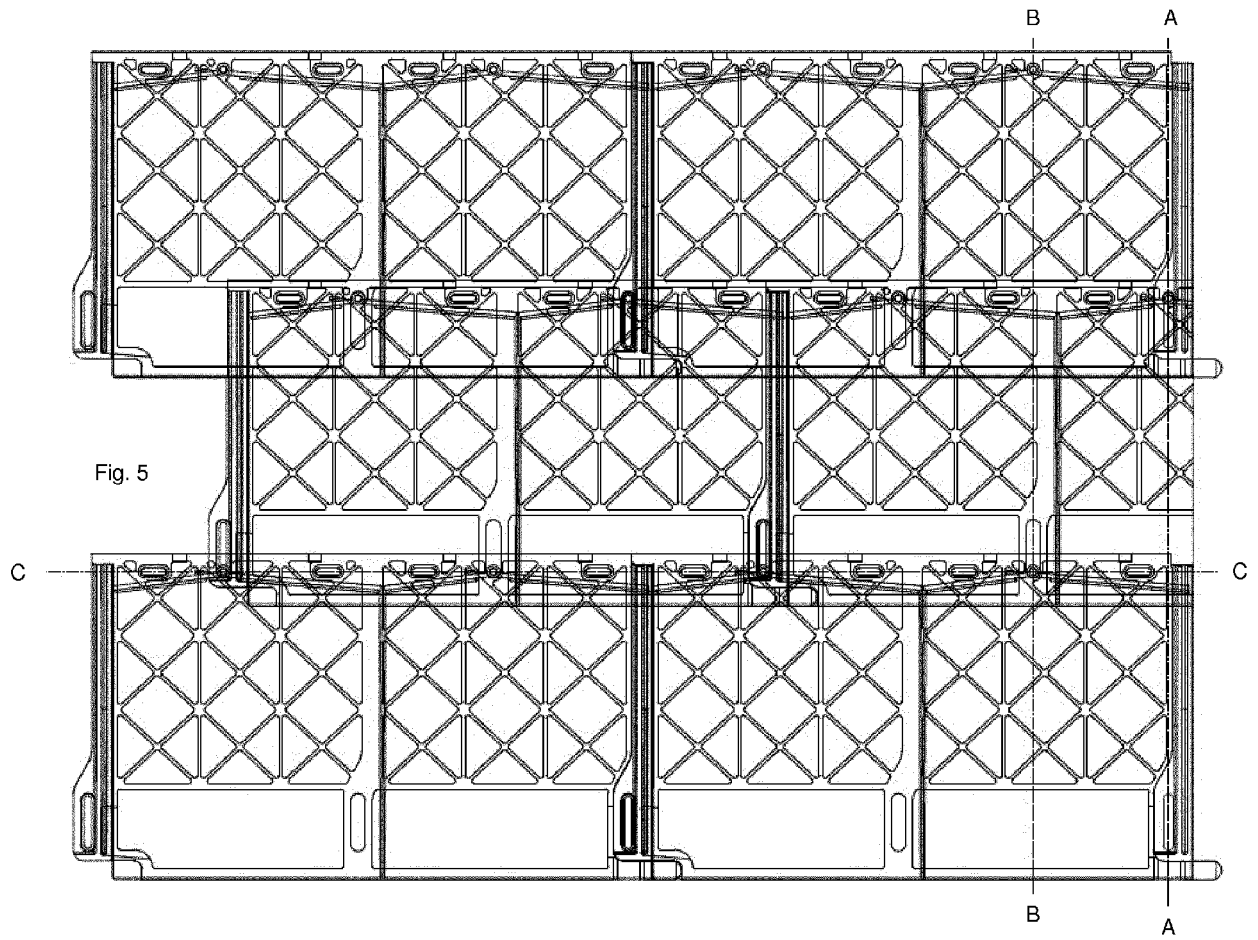


Fig. 4



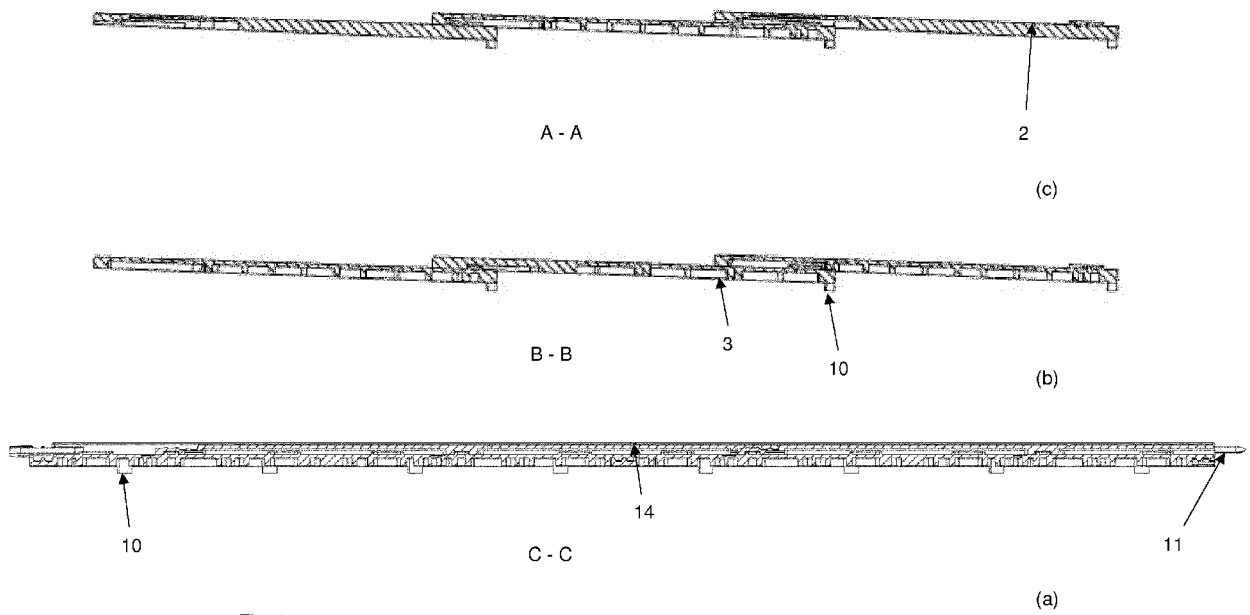


Fig. 6



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