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(71) Applicant(s)
Kwok Pun Chan
34 Sunderland Street, MACCLESFIELD,
Cheshire, SK11 6JL, United Kingdom

(72) Inventor(s)
Kwok Pun Chan

(74) Agent and/or Address for Service
Ronald Graves
24 Fitzwilliam Avenue, Sutton,
MACCLESFIELD, Cheshire, SK11 0EJ,
United Kingdom

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(54) Abstract Title
A brick and brick laying tools

(57) A brick comprises opposed bedding surfaces (11, 12) and opposed end surfaces (13) wherein at least one of each of the bedding and end surfaces has a recess (16, 18) therein with a brick contacting region adjacent (17, 19) to said recess. Preferably the recess is a 'V' shaped groove extending centrally along the surface. When only one end surface is grooved (Figures 5-7), a brick contacting region (35, Figure 7) may be located at an end of the recess in the bedding surface. A plurality of such bricks may assembled to form a wall (Figures 4 and 8) with mortar being located in each recess.

A mortar dispensing tool (40, Figure 9), in the form of a tube (41, Figure 9) having a handle (48, Figure 9) and a piston (43, Figure 9) therein is disclosed for applying mortar to the brick recesses. A mortar hopper (51, Figure 9) having an aperture (52, Figure 9) at a lower end thereof which preferably corresponds in shape to the cross sectional shape of the dispensing tool tube may be provided for supplying mortar to the dispensing tool. Further disclosed is a smoothing device (67, Figure 11) preferably having an inverted 'V' shaped smoothing surface (69, Figure 11) with sidewalls (70, Figure 11) depending therefrom and wheels (71, Figure 11) attached to the side walls which allow the device to slide along a course of bricks.

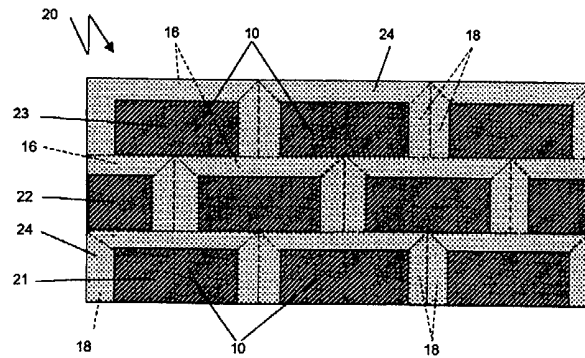
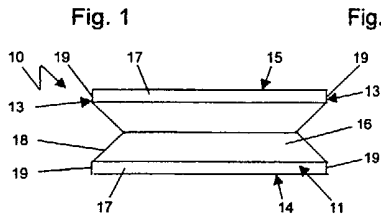
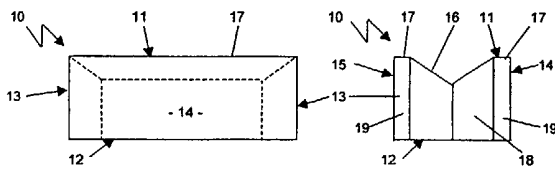


Fig. 3

Fig. 4

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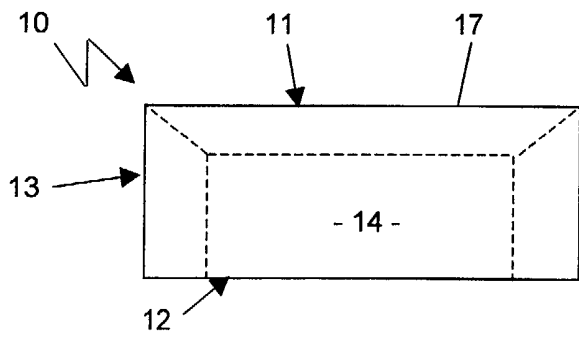


Fig. 1

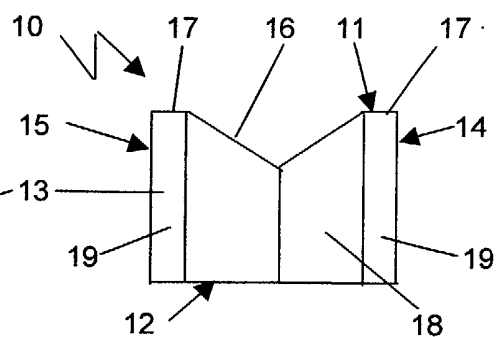


Fig. 2

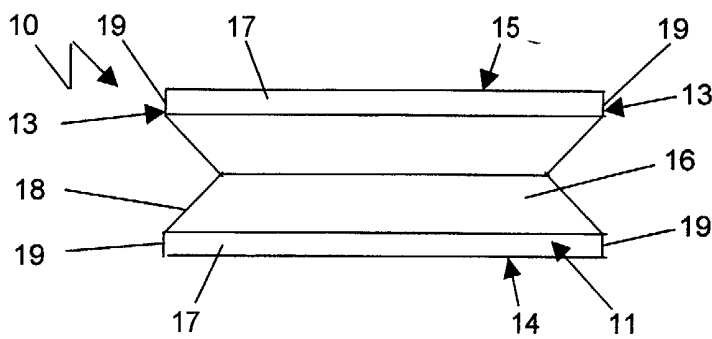


Fig. 3

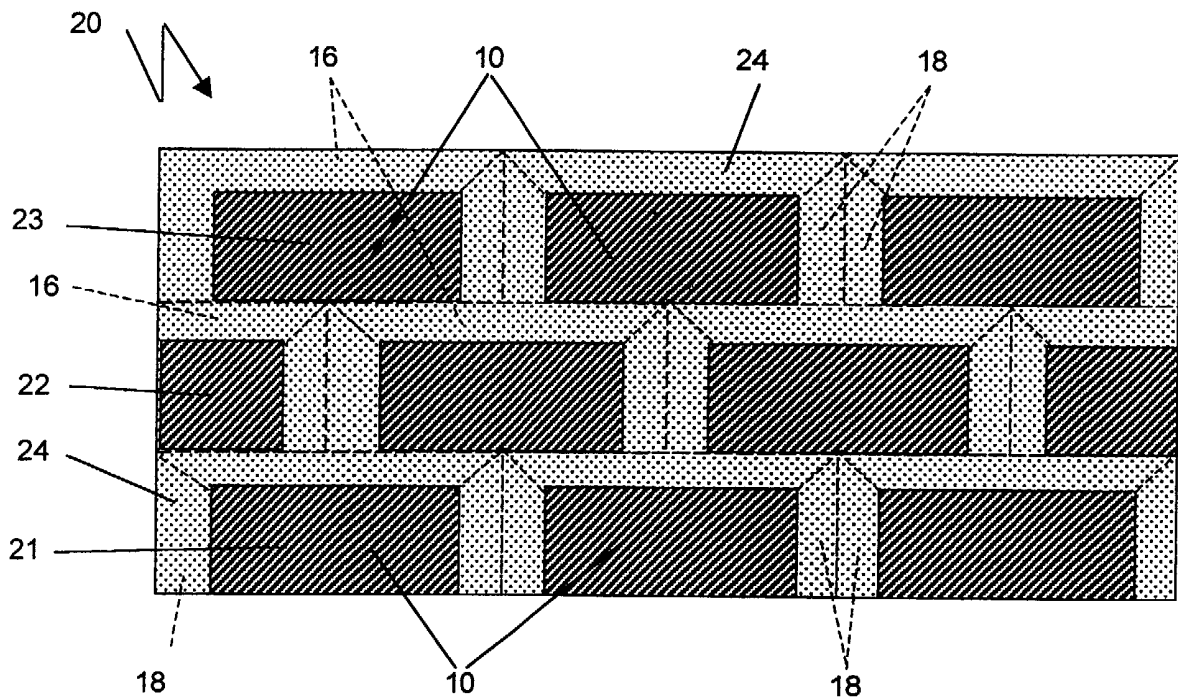


Fig. 4

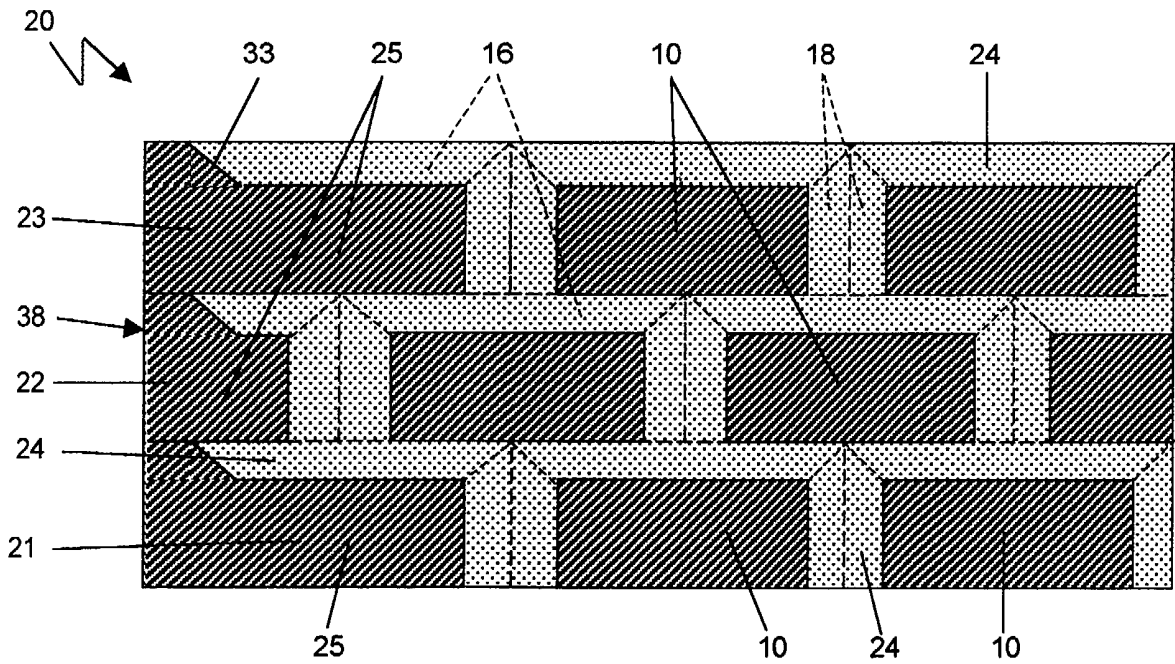
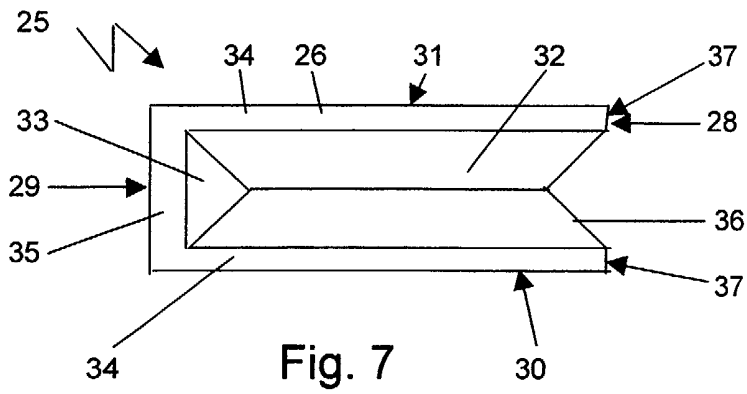
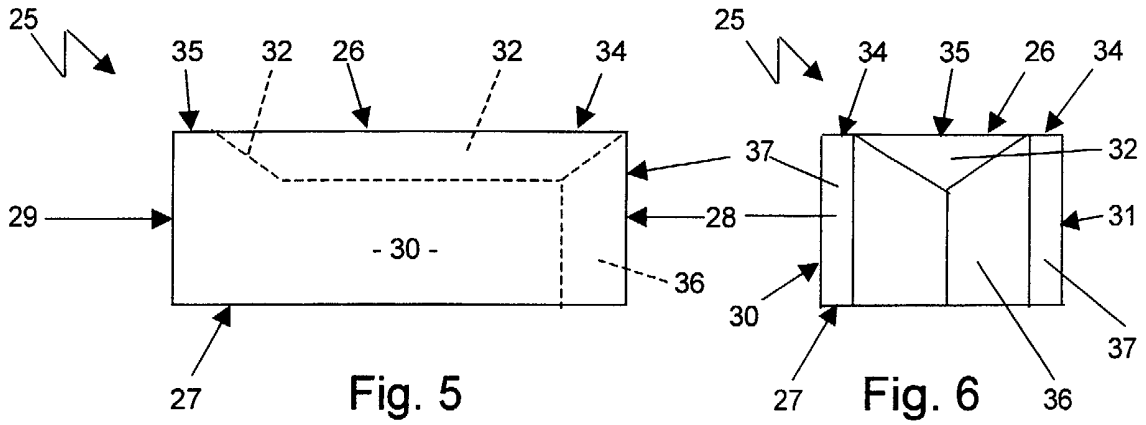


Fig. 8

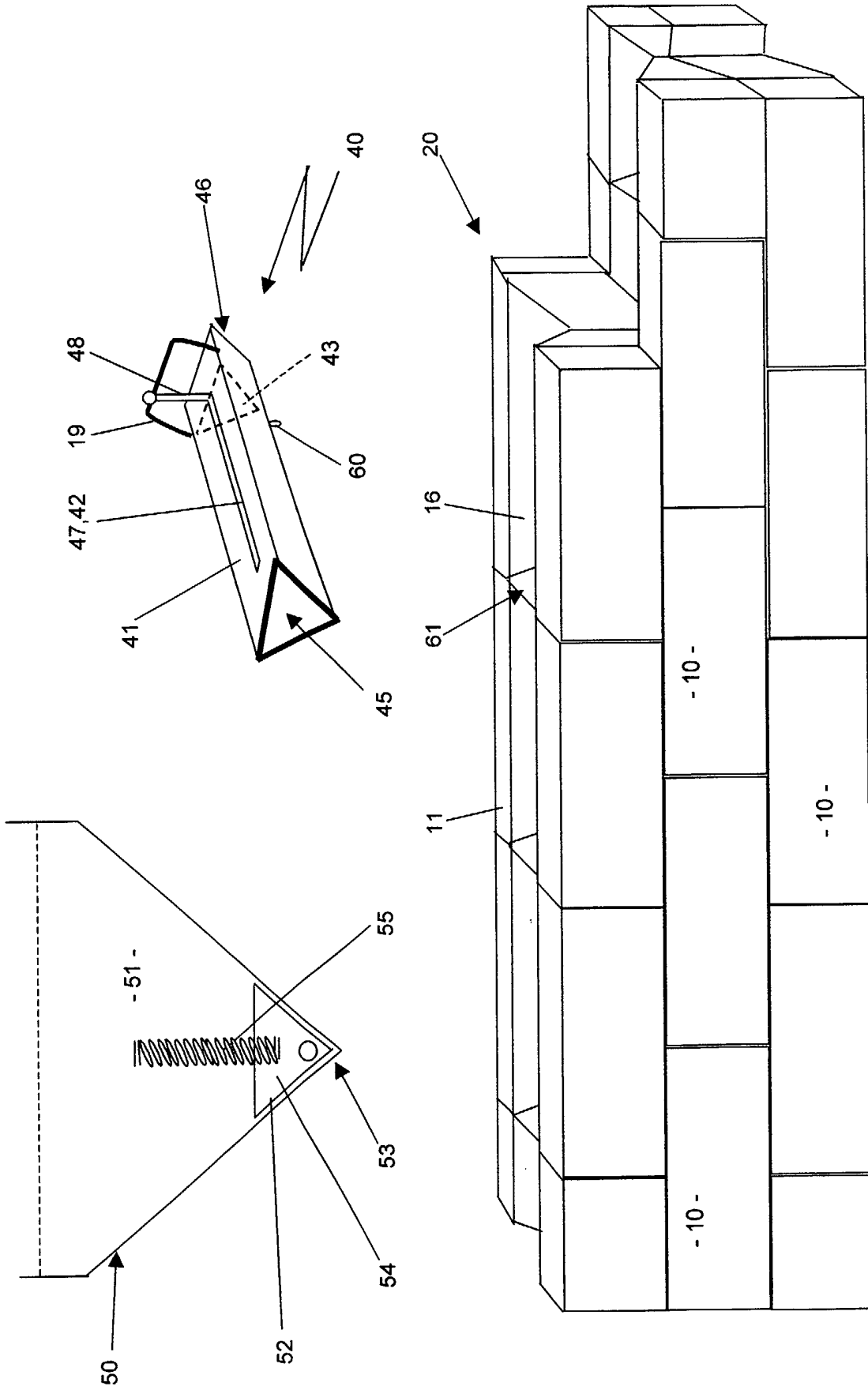


Fig. 9

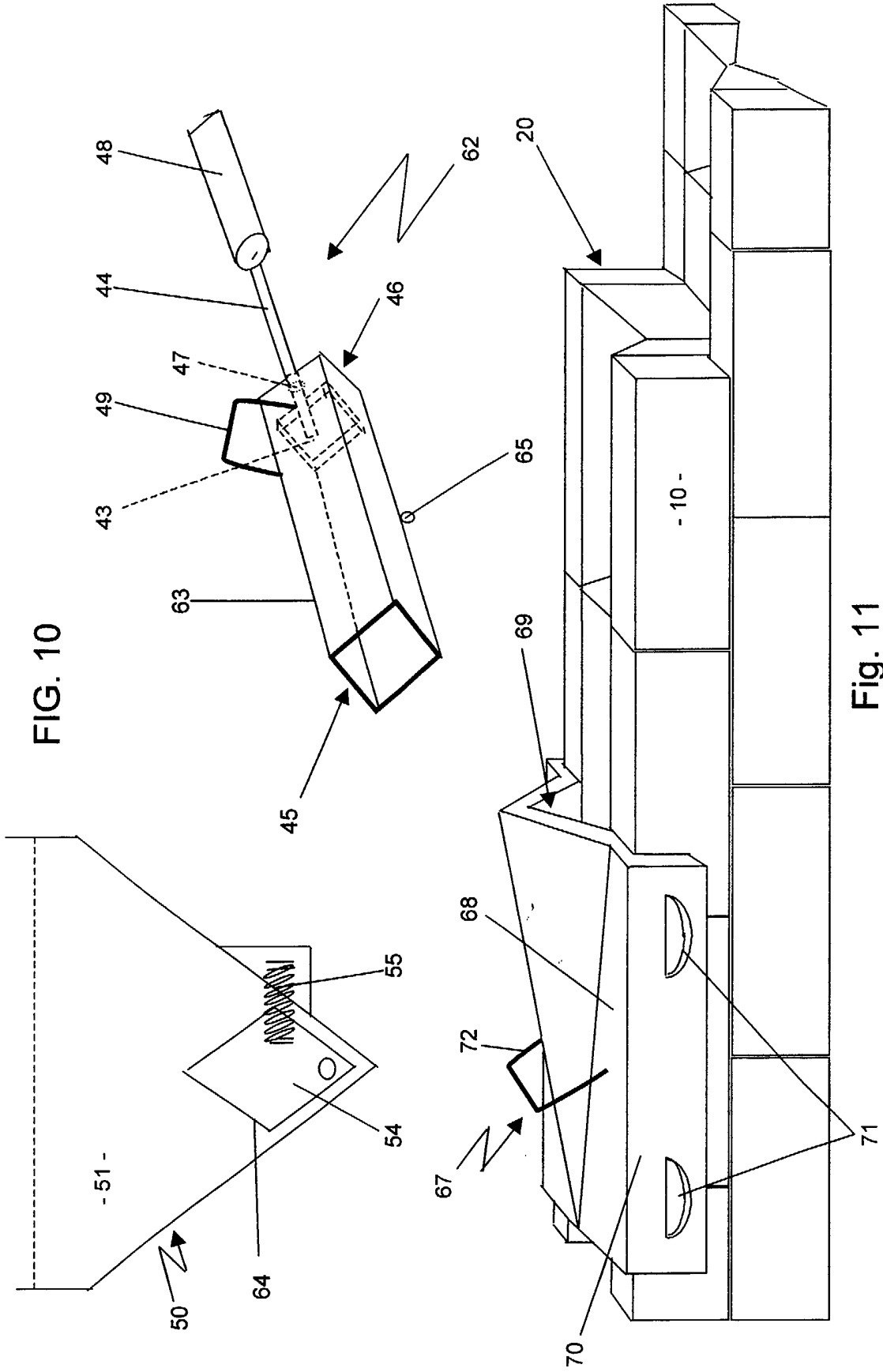


FIG. 10

Fig. 11

This invention relates to bricks, and in particular to bricks for use in the building trade, and tools for use in laying such bricks.

Bricks have been used in the building trade for many generations, and various shapes of brick have been used in that time. It is conventional that these known bricks are laid with beds of mortar between the bedding surfaces of bricks in adjacent courses, and mortar between the end surfaces of adjacent bricks in any course, in order to bond those bricks to each other. It is known for such bricks to have apertures therethrough or recesses in the bedding surfaces to provide that the beds of mortar are more firmly keyed to the bricks. However, building in this conventional manner is labour intensive and requires a degree of expertise and skill, particularly since in most cases speed of laying is essential in order to minimise construction costs. Bricks having interlocking formations thereon have been proposed as a means of avoiding the use of mortar and to speed up the laying process, but such bricks do not provide structures having the integrity attainable with conventional bricks using mortar. Bricks are laid using a trowel to apply a quantity of mortar to an end of the brick to be laid and to the top of previously laid bricks, before presenting the brick to be laid to the mortar on the previously laid bricks. It is an acquired art to judge correctly the amount of mortar to be scooped onto the trowel so that the correct amount of mortar is applied to the bricks for an even thickness of mortar between adjacent bricks throughout a construction being built. Also, building in such a manner is time consuming and therefore adds considerably to the cost of the construction.

It is an object of the present invention to provide a brick that allows for speedier laying compared with conventional bricks and provides the structural integrity of conventional bricks laid with beds of mortar therebetween. It is a further object of the present invention to provide a tool by means of which a predetermined quantity of mortar may be applied to a brick in a quick and simple manner.

The invention provides a brick for use in the building trade, of rectangular form having opposed bedding surfaces and opposed end surfaces, wherein at least one of the bedding surfaces has a recess therein providing a brick contacting region adjacent thereto, and at least one of the end surfaces has a recess therein providing a brick contacting region adjacent thereto.

The recess may be a groove extending along the surface, and the groove may extend along the full length of the surface. In the latter case, both end surfaces may have a recess therein.

The groove may be a V-shaped groove. The groove may be of constant cross-section along its length. Preferably the grooves in the at least one bedding surface and the groove in the at least one end surface converge. The groove may be centrally disposed in the surface, with brick contacting regions on opposed sides of the recess. The groove may be centrally disposed in the surface, with brick contacting regions on opposed sides of the groove and at one end of the groove.

The brick may be substantially 225 mm in length, 102.5 mm in width and 75 mm in depth. The recess may extend laterally to 80% of the width of the brick, and may have a depth of between 20% and 40% of the depth of the brick.

The invention also provides a structure comprising a plurality of bricks in adjacent courses, each brick being of rectangular form having opposed bedding surfaces and opposed end surfaces, wherein at least one of the bedding surfaces and at least one of the end surfaces has a recess therein providing a brick contacting region adjacent thereto in contact with a corresponding brick contacting surface of at least one adjacent brick.

The structure may have mortar disposed in each recess in the plurality of bricks. Each recess may be filled with mortar.

The invention also provides a brick as aforesaid and brick-laying tool for use with such brick, the tool comprising a tubular body having an open end, a handle and a piston device disposed in the tubular body and movable therealong to dispense through the open end mortar contained in the tubular body.

The handle may be connected to the piston, and may pass through a slot in the tubular body. The slot may have a closure device, and the closure device may comprise interlocking teeth. In this case, the handle may comprise a slider operable to open and close the teeth. Alternatively, the piston may be connected to a piston rod that extends axially of the tubular body. The piston rod may pass through a body aperture in an otherwise closed end of the tubular body. The tool may comprise a second handle, which may be connected to the tubular body. The tubular body may be of triangular, diamond-shaped, semi-circular or circular cross section.

The invention also provides a brick, a brick-laying tool as aforesaid and a mortar supply device comprising an upstanding hopper having a hopper aperture therein at its lower end. The hopper aperture may have a shape corresponding with the cross-section of the brick-laying

tool whereby in use the tool may be inserted through the hopper aperture to receive from the hopper a predetermined quantity of mortar into the tubular body. The hopper may have a door disposed to close the hopper aperture, and the door may be spring loaded to close the hopper aperture when the brick-laying tool is removed from the hopper. The tubular body may have a stop thereon disposed to limit the length of the body's entry into the hopper aperture.

The invention also provides a brick and a smoothing device comprising a body having a smoothing surface and at least one sidewall depending therefrom. The smoothing surface may be of an inverted V-shape. The body may comprise a pair of sidewalls depending from opposed edges of the smoothing surface. The smoothing device may comprise slide means disposed to extend inwardly of the or each sidewall. The slide means may comprise wheels. The smoothing device may have a handle disposed externally of the smoothing surface.

The invention will now be described with reference to the accompanying drawing in which:

Fig. 1 is a front view of a brick

Fig. 2 is an end view of the brick of Fig. 1,

Fig. 3 is a plan view of the brick of Figs. 1 and 2, and

Fig. 4 is a vertical section through a structure formed with the bricks of Figs. 1 to 3.

Fig. 5 is a front view of an end brick

Fig. 6 is an end view of the end brick of Fig. 5,

Fig. 7 is a plan view of the end brick of Figs. 5 and 6, and

Fig. 8 is a vertical section through a structure formed with bricks of Figs. 1 to 3 and Figs. 5 to 7.

Fig. 9 is a perspective view of a first embodiment of brick-laying tool,

Fig. 10 is a perspective view of a second embodiment of brick-laying tool, and

Fig. 11 shows a smoothing device in operation.

Referring now to Figs. 1 to 3, there is shown a brick 10, of rectangular form and having upper and lower bedding surfaces 11, 12, opposed end surfaces 13 and opposed face surfaces 14, 15. Extending along the upper bedding surface 11 is a recess in the form of a V-shaped groove 16 of constant cross-section along its length. The groove 16 is centrally disposed in the bedding surface 11, leaving brick contacting regions 17 on either side thereof. Similarly, each end surface 13 has a recess in the form of a V-shaped groove 18 of constant cross-section along its length. Each groove 18 is also centrally disposed in the end surface 13, leaving brick contacting regions 19 on either side thereof. The grooves 18 converge with the groove 16. The grooves 16, 18 extend laterally to 80% of the width of the brick 10, and have a depth of between 20% and 40% of the depth of the brick 10.

Referring now to Fig. 4, there is shown a structure 20 formed of bricks 10 laid in courses 21, 22, 23. The bricks 10 in course 21 are laid end-to-end with their brick contacting regions 13 in mutual contact and mortar 24 filling the grooves 18, thereby bonding those bricks 10 together. The grooves 16 in the upper bedding surfaces 11 of the bricks 10 in course 21 are then filled with mortar 24. The bricks 10 of the second course 22 are then laid on top of the first course 21 with their lower bedding surfaces 12 in contact with the brick contacting regions 17 of the bricks 10 in course 21 and with the mortar 24 in the grooves 16. By this means, the bricks 10 in course 22 are bonded to the bricks 10 in course 21. Again the grooves 18 in the bricks 10 in course 22 are filled with mortar 24 and the above process is repeated with course 23 and all subsequent courses.

Referring now to Figs. 5 to 7, there is shown an end brick 25, of rectangular form and having upper and lower bedding surfaces 26, 27, opposed end surfaces 28, 29 and opposed face surfaces 30, 31. Extending along the major part of the upper bedding surface 26 is a recess in the form of a V-shaped groove 32 of constant cross-section along its length and with a sloping end face 33. The groove 32 is centrally disposed in the bedding surface 26, leaving brick contacting regions 34 on either side and 35 at the end thereof. One end surface 28 has a recess in the form of a V-shaped groove 36 of constant cross-section along its length. The groove 36 is also centrally disposed in the end surface 28, leaving brick contacting regions 37 on either side thereof. The groove 36 converges with the groove 32.

As shown in Fig. 8, the structure 20 has bricks 10 laid as described above. However, at an end of the structure 20 are end bricks 25. Two lengths of end brick 25 are employed so as to provide a vertical end face 38 that is free from grooves 16, 18, 32 or 36.

Other embodiments of brick in accordance with the invention will be readily apparent to persons skilled in the art. For example, the grooves 16, 18, 32, 36 may be of circular, elliptic, rectangular or other cross-section, and may be of varying cross-section along their length. Only one end surface 13 of brick 10 may have a groove 18 therein and/or both upper and lower bedding surfaces 11, 12, 26, 27 of bricks 10, 25 may have grooves 16, 32 therein.

It will be seen that there is a continuum of mortar 24 both horizontally and vertically throughout all of the courses of the structure 20, thereby providing the structural integrity normally provided by conventional bricklaying. However, since the bricks 10, 25 are placed in contact with each other, the degree of expertise and skill normally required for conventional bricklaying is not required. In addition, building the structure 20 is considerably quicker using

the bricks 10, 25 than using conventional bricks laid on beds of mortar in the conventional manner. In this regard, less time is required to allow the mortar 24 to set between laying successive courses than is required with conventional bricklaying. Furthermore, since the front faces 14, 30 of the bricks 10, 25 are mutually adjacent with no mortar breaks therebetween, the front surface of the structure 20 is better able to receive and retain tile, render, paint or other surface coatings than conventionally built structures.

Referring now to Fig. 9, there is shown a brick-laying tool 40 having a tubular body 41 of triangular cross-section. The body 41 has an open end 45 and a substantially closed end 46. Slidably fitted within the body 41 is a correspondingly shaped piston 43 to which a handle 48 is attached. The handle 48 passes through a slot 47 in the body 41, which is closed to either side of the handle 48 by means of a closure device 42 of the flexible rubber flap or interlocking teeth type. In the latter case, the handle 48 acts as the slider to open the teeth in front of it and close the teeth behind it. A second handle 49 is attached to the body 41 if desired. A mortar supply device 50 comprises an upstanding hopper 51. The hopper 51 has an aperture 52 at its tapered lower end 53, and a door 54 disposed to close the aperture 52. A spring 55 biases the door 54 towards the closed position. The aperture 52 is also of triangular cross-section and sized to allow the body 41 to pass through the aperture 52 with only a small clearance.

Operation of the tool 40 is as follows. The hopper 51 is filled with mortar. Using the handle 48, the piston 43 is moved along the body 41 so that it is adjacent the closed end 46. The door 54 of the hopper 51 is opened and the tool 40 is pushed into the aperture 52 until the stop 60 prevents further entry. This causes mortar to enter and fill the tubular body 41. The tool 40 is removed from the hopper 51, allowing the spring 55 to close the door 54. The tool 40 is then placed on the upper bedding surface 11 of previously laid bricks 10 of wall construction 20, and the handle 48 pushed along the body 41, thereby forcing the mortar in the body 41 into the groove 16. The stop 60 on the tubular body 41 is chosen to be distant from the open end 45 by an amount equal to the length of the bricks 10, and the cross-section of the body 41 is substantially the same as that of the groove 16. This ensures that the amount of mortar dispensed from the tool 40 just fills the groove 16. A new brick 10 may then be placed on the wall construction 20. The process is then repeated for the next brick 10.

The above procedure leaves a gap 61 between adjacent bricks 10 in the same course. This gap 61 may be filled using the tool 62 as shown in Fig. 10. In this case, the body 63 is of diamond-shaped cross-section. A piston rod 44 is secured to the piston 43 and the piston rod 44 passes axially of the body 63 through an aperture 47 in the otherwise closed end 46. A

handle 48 is attached to or formed integrally with the free end of the piston rod 44. A hopper aperture 64 is provided, also of diamond-shaped cross-section and sized to allow the body 63 to pass through the aperture 64 with only a small clearance. A stop 65 on the tubular body 63 is chosen to be distant from the open end 66 by an amount equal to the height of the bricks 10, and the cross-section of the body 63 is substantially the same as that of the gap 61. This ensures that the amount of mortar dispensed from the tool 62 just fills the gap 61.

If the cross-section of the grooves 16 is other than triangular, for example semi-circular, the cross-sections of the bodies 41, 63 and hopper apertures 52, 64 are correspondingly semi-circular and circular respectively. If the bricks 10 have grooves 16 in both the upper surface 11 and the lower surface 12, a tool of the form of tool 62, but of length equal to that of a brick 10 may be used in filling the groove 16. Similarly, if the bricks 10 have a groove in only one end, a tool of the form of tool 40, but of length equal to the height of a brick 10 may be used in filling gap 61.

If excess mortar is applied to the laid bricks 10, a smoothing device 67 may be used as shown in Fig. 11. The smoothing device 67 comprises a channel shaped body 68 having an inverted V-shaped smoothing surface 69 and a pair of sidewalls 70 depending from opposed edges of the smoothing surface 69. Preferably, the smoothing surface 69 has a low friction material such as PTFE provided thereon. The smoothing device 67 has a handle 72 disposed externally of the smoothing surface 69 by means of which the smoothing device 67 is drawn along the top of the wall construction 20. In the embodiment shown, wheels 71 are mounted in the sidewalls 70 so as to protrude inwardly of the sidewalls 70. The channel shaped body 68 straddles the wall construction 20 with the wheels 71 able to contact the front and rear faces of the bricks 10. This action forces any excess mortar above the level of the upper surface 11 of the bricks 10 into the groove 16 and also smoothes off the mortar. As an alternative, a low friction material such as PTFE could be provided on the inside of the sidewalls 70 instead of the wheels 71.

By means of the invention, a brick built construction 20 may be built by an inexperienced builder relatively quickly. The correct amount of mortar to fill the joints between the bricks 10 is readily obtained, thereby creating a regular construction 20 previously only obtainable by a skilled and experienced builder.

CLAIMS

1. A brick for use in the building trade, of rectangular form having opposed bedding surfaces and opposed end surfaces, wherein at least one of the bedding surfaces has a recess therein providing a brick contacting region adjacent thereto, and at least one of the end surfaces has a recess therein providing a brick contacting region adjacent thereto.
2. A brick according to claim 1, wherein the recess is a groove extending along the surface.
3. A brick according to claim 1 or claim 2, wherein the groove extends along the full length of the surface.
4. A brick according to claim 3, wherein both end surfaces have a recess therein.
5. A brick according to any one of claims 2 to 4, wherein the groove is a V-shaped groove.
6. A brick according to any one of claims 2 to 5, wherein the groove is of constant cross-section along its length.
7. A brick according to any one of claims 2 to 6, wherein the groove in the at least one bedding surface and the groove in the at least one end surface converge.
8. A brick according to claim 7, wherein the groove is centrally disposed in the surface, with brick contacting regions on opposed sides of the groove.
9. A brick according to claim 2, wherein the groove is centrally disposed in the surface, with brick contacting regions on opposed sides of the groove and at one end of the groove.
10. A brick according to any one of claims 1 to 9, wherein the brick is substantially 225 mm in length.
11. A brick according to any one of claims 1 to 10, wherein the brick is substantially 102.5 mm in width.

12. A brick according to any one of claims 1 to 11, wherein the brick is substantially 75 mm in depth.
13. A brick according to any one of claims 1 to 12, wherein the recess extends laterally to 80% of the width of the brick.
14. A brick according to any one of claims 1 to 13, wherein the recess has a depth of between 20% and 40% of the depth of the brick.
15. A structure comprising a plurality of bricks in adjacent courses, each brick being of rectangular form having opposed bedding surfaces and opposed end surfaces, wherein at least one of the bedding surfaces and at least one of the end surfaces has a recess therein providing a brick contacting region adjacent thereto in contact with a corresponding brick contacting surface of at least one adjacent brick.
16. A structure according to claim 13, having mortar disposed in each recess in the plurality of bricks.
17. A structure according to claim 16, wherein each recess is filled with mortar.
18. A brick according to any one of claims 1 to 14, and a brick-laying tool for use with such brick, the tool comprising a tubular body having an open end, a handle and a piston disposed in the tubular body and movable therealong to dispense through the open end mortar contained in the tubular body.
19. A brick and brick-laying tool according to claim 18, wherein the handle is connected to the piston.
20. A brick and brick-laying tool according to claim 19, wherein the handle passes through a slot in the tubular body.
21. A brick and brick-laying tool according to claim 20, wherein the slot has a closure device.
22. A brick and brick-laying tool according to claim 21, wherein the closure device comprises interlocking teeth, and the handle comprises a slider operable to open and close the teeth.

23. A brick and brick-laying tool according to claim 18, wherein the piston is connected to a piston rod that extends axially of the tubular body.
24. A brick and brick-laying tool according to claim 23, wherein the piston rod passes through a body aperture in an otherwise closed end of the tubular body.
25. A brick and brick-laying tool according to any one of claims 19 to 24, comprising a second handle.
26. A brick and brick-laying tool according to claim 25, wherein the second handle is connected to the tubular body.
27. A brick and brick-laying tool according to any one of claims 18 to 26, wherein the tubular body is of triangular cross section.
28. A brick and brick-laying tool according to any one of claims 18 to 26, wherein the tubular body is of diamond-shaped cross section.
29. A brick and brick-laying tool according to any one of claims 18 to 26, wherein the tubular body is of semi-circular cross section.
30. A brick and brick-laying tool according to any one of claims 18 to 26, wherein the tubular body is of circular cross section.
31. A brick and brick-laying tool according to any one of claims 18 to 30 and a mortar supply device, wherein the mortar supply device comprises an upstanding hopper having a hopper aperture therein at its lower end.
32. A brick, a brick-laying tool and a mortar supply device according to claim 31, wherein the hopper aperture has a shape corresponding with the cross-section of the brick-laying tool whereby in use the tool may be inserted through the hopper aperture to receive from the hopper a predetermined quantity of mortar into the tubular body.
33. A brick, a brick-laying tool and a mortar supply device according to claim 31 or claim 32, wherein the hopper has a door disposed to close the hopper aperture.

34. A brick, a brick-laying tool and a mortar supply device according to claim 33, wherein the door is spring loaded to close the hopper aperture when the brick-laying tool is removed from the hopper.
35. A brick, a brick-laying tool and a mortar supply device according to any one of claims 31 to 34, wherein the tubular body has a stop thereon disposed to limit the length of the body's entry into the hopper aperture.
36. A brick according to any one of claims 1 to 17, and a smoothing device, wherein the smoothing device comprises a smoothing body having a smoothing surface and at least one sidewall depending therefrom.
37. A brick and a smoothing device according to claim 36, wherein the smoothing surface is an inverted V-shape.
38. A brick and a smoothing device according to claim 36 or claim 37, wherein the smoothing body comprises a pair of sidewalls depending from opposed edges of the smoothing surface.
39. A brick and a smoothing device according to any one of claims 36 to 38, wherein the smoothing device comprises slide means disposed to extend inwardly of the or each sidewall.
40. A brick and a smoothing device according to claim 39, wherein the slide means comprise wheels.
41. A brick and a smoothing device according to any one of claims 36 to 40, wherein the smoothing device has a handle disposed externally of the smoothing surface.
42. A brick for use in the building trade substantially as hereinbefore described with reference to and as illustrated in Figs. 1 to 3 or Figs. 5 to 7 of the accompanying drawings.
43. A structure comprising a plurality of bricks in adjacent courses substantially as hereinbefore described with reference to and as illustrated in Fig. 4, Fig. 8 or Fig. 9 of the accompanying drawings.
44. A brick, and brick-laying tool substantially as hereinbefore described with reference to and as illustrated in Fig. 9 or Fig. 10 of the accompanying drawings.

45. A brick, a brick-laying tool and a mortar supply device substantially as hereinbefore described with reference to and as illustrated in Fig. 9 or Fig. 10 of the accompanying drawings.

46. A brick, and a smoothing device substantially as hereinbefore described with reference to and as illustrated in Fig. 11 of the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0224066.1
Claims searched: 1-43

Examiner: Joanne Pullen
Date of search: 7 January 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X, Y	X 1-3 & 6-17 Y 18, 23 & 27-31	GB 1597670 A (HABEGGER et al) Whole document.
X, Y	X 1-3, 6-17 Y 18, 23 & 27-31	GB 527275 A (WORTHINGTON) Whole document.
X, Y	X 1-3, 5-8 & 10-17 Y 18, 23 & 27-31	AU 514614 A (ROUDETTE) Whole document.
X, Y	X 1-3, 7, 8, 10-17 Y 18, 23 & 27-31	DE 827859 A (MESSERSCHMITT et al) Figures.
X, Y	X 1-4, 5-8 & 10-17 Y 18, 23 & 27-31	FR 949164 A (MARCEROU) Figures.
X, Y	X 1-8 & 10-17 Y 18, 23 & 27-31	FR 907375 A (MAGGIONI et al) Figures.
X, Y	X 1-8 & 10-17 Y 18, 23 & 27-31	US 4299071 A (TIAN) Whole document.
Y	18, 23 & 27-30	EP 0165008 A2 (ROOKS) Figure 1.
Y	31	GB 1251820 A (EURO-FINA INVESTMENTS) Note mortar hopper 2.

Categories:



INVESTOR IN PEOPLE

Application No: GB 0224066.1
Claims searched: 1-43

Examiner: Joanne Pullen
Date of search: 7 January 2003

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^v:

E1D DLEQWNT, DLEQWNW, DLEQWST, DLEQWSW

Worldwide search of patent documents classified in the following areas of the IPC⁷:

E04B

The following online and other databases have been used in the preparation of this search report:

Online: EPODOC, WPI, JAPIO