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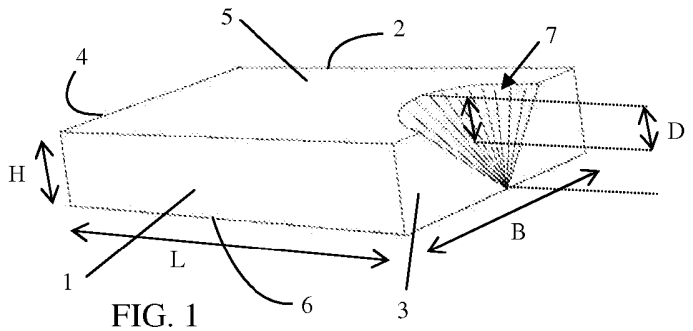

FIG. 1

(57) Abstract: A building brick, more particularly a facing brick for brickwork with courses of building bricks stacked on top of each other which are bonded to each other by means of a binding mortar whereby the building bricks are separated from each other, wherein this building brick has at least a first, full stretcher (I)1 with a length which corresponds with the length (L). of the building brick and a height which corresponds with the height (H) of the building brick, wherein this stretcher (1) is visible in the brickwork, and wherein, at least in one bed surface (5), this building brick has a recess (7) which leads to at least one header (3) of the building brick, such that this recess allows binding mortar to be guided from the bed surface (5) via the recess (7) to the header (3) when effecting brickwork with the building brick.

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Title: Building brick and method for effecting brickwork therewith

The invention relates to a building brick, in particular a brick or a facing brick for brickwork with courses of building bricks stacked one on top of the other, which are bonded by means of a binding mortar whereby the building bricks are separated from each other, wherein this building brick has at least a full stretcher with a length which corresponds with the length of the building brick and a height which corresponds with the height of the building brick, while this stretcher is visible in the brickwork.

Such beam-shaped building bricks are known per se. They have two mutually opposed, approximately parallel bed surfaces by which they are laid on top of each other in the brickwork. Therefore, the bed surface is a surface of the building brick which is normally provided horizontally in brickwork. These building bricks further have two stretchers which are the longitudinal sides and mostly also the narrow sides of the building brick. Most often, the stretcher is visible in brickwork. Finally, these building bricks have two mutually opposed headers which are the smallest side surfaces of the building brick, and which can also be visible in the brickwork.

Examples of such building bricks are hand-formed bricks and moulded bricks. A hand-formed brick is a brick which is obtained by inserting a mostly pre-sanded lump of soft clay in a mould, which leads to a typically veined appearance. A moulded brick is a brick which is obtained by mechanically pressing the soft clay in moulds, so that the brick obtains a very taut shape.

According to the present state of the art, in classic brickwork, building bricks are laid one on top of the other with the aid of a binding mortar. Here, an amount of binding mortar is applied to a horizontal bed surface of a previously laid building brick of a first course of building bricks and also against a header of another, previously placed building brick of a second course of building bricks. The skilled person is deemed capable of

estimating the amount of binding mortar that is to be applied for sufficiently binding the building bricks. Any excess binding mortar can be wiped away. Then, a new building brick is placed in the second course with a bed surface on the applied binding mortar. The new building brick is pressed on, so that the binding mortar spreads evenly between the mutually opposed bed surfaces and also in the butt between the mutually opposed headers. Here, excess binding mortar is pressed out and has to be removed on the stretchers. What should further be prevented is the excess binding mortar falling in a cavity between the façade and the inner wall.

Traditionally, bricks are laid in this manner, while a joint of approximately 12 mm is formed between the bricks in the wall. This joint can be pointed with binding mortar after the bricks have been laid.

Therefore, traditional brickwork consists mainly of building bricks stacked on top of each other with binding mortar therebetween. Here, use is made of non-calibrated bricks, quick bricks or facing bricks. Building bricks, such as hand-formed bricks which are formed in a mould can exhibit slight irregularities which are compensated for by the layer of binding mortar which is present between the bricks in the wall.

The bed surfaces of non-calibrated building bricks are not perfectly level so that they are less suited for partial dry setting. This is contrary to, for instance, the building elements described in Belgian patent BE 1011516 A. These known building elements are calibrated so that they fit on top of each other perfectly such that no specialized expertise for placing is required. Such building elements are provided with recesses and matching upstanding edges which interlock perfectly but are, for that reason, rather complex in manufacture.

Furthermore, in such calibrated building elements, cavities are provided for a well-defined amount of binding mortar. An excess of binding mortar will hinder correct placement of the building element. The headers of

these building elements interlock by means of a groove and tongue connection so that these too are unsuited to be provided with binding mortar.

Further, there is a tendency towards walls with a solid appearance where joints are reduced to a minimum in order to obtain maximum brick surface in the brickwork.

This effect can be obtained by utilizing specially calibrated building elements which are partly set dry. To this purpose, classic building bricks may also be glued. The glue layer has to be only a few millimetres thick so that it is almost invisible, which is impossible when mortar is used. A drawback of this gluing technique is that the labourer has to have special skills and equipment. Furthermore, after use, the equipment has to be thoroughly cleaned. Also, most often, butts and/or head joints are not glued, as an additional operation is required for additional application of glue to the headers of the building bricks. Therefore, the head joints remain open.

Consequently, for gluing in particular facing bricks, craftsmanship is required and mistakes stand out stronger than in traditional brickwork. Also, dimensionally stable or calibrated building bricks have to be used such as concrete bricks, wire cut bricks. So-called hand-formed bricks may also be glued, but the joint will then be slightly thicker.

As an alternative to gluing, also, use is made of special types of mortar, such as thin-bed mortar, with which the joints in traditional brick laying are reduced to a thickness of 4 to 7 mm.

European patent application EP 1 983 122 describes a brick where the mortar bed is recessed in the brick so that the classic mortar joint is reduced to a minimum, while yet use is made of a classic mortar such as binding mortar. The final appearance of the brickwork is virtually the same as with glued bricks. The thickness of the visible part of the mortar layer can even be less than 3 mm. However, this prior art brick and method for bricklaying has the drawback that, as is the case with glued brickwork, the head joints where the building bricks stand against each other by the short

sides, are open. These head joints are not filled with mortar as this would necessitate too thick a joint.

As in existing so-called jointless brickwork the openings between the headers are not or insufficiently filled, openings are formed in the brickwork which allow a view into the cavity of the wall and which furthermore allow access to wind, rain and vermin.

The invention seeks to remedy these drawbacks by proposing a building brick and a method for laying such a building brick, which enables virtually jointless brickwork through traditional bricklaying, preferably without special binding mortar such as thin-bed mortar or glue, and wherein furthermore, head joints are filled with binding mortar in a simple manner. This building brick and method further also enable glued brickwork, where head joints are filled in a simple manner.

To this end, at least in one bed surface, this building brick has a recess which leads to one header of the building brick, wherein this recess allows guiding of the binding mortar from the bed surface via the recess to the header when the building brick is laid in brickwork, as is claimed in the appended claims. Preferably, the building brick is a building brick formed in a mould, such as a hand-formed brick or a moulded brick.

Effectively, the depth of the recess, in a direction perpendicular to the bed surface, decreases according as the distance with regard to the header increases.

In an advantageous manner, the recess extends over

- at least 50%, preferably at least 70%, in particular at least 90% of the width of the building brick;

- at least 10%, preferably at least 20%, in particular at least 50% of the length of the building brick;

- at least 50%, preferably at least 90%, in particular 100% of the height of the building brick;

- at least 20%, preferably at least 50%, in particular at least 80% of the surface of the first bed surface of the building brick;

- at least 20%, preferably at least 50%, in particular 90% of the surface of the first header of the building brick.

In a particularly advantageous manner, the recess is bounded by at least a wall which is at an angle to the first bed surface, which angle is between approximately 20° and 80°, preferably between approximately 30° and 70°, and in particular is in the order of 45°.

According to a special embodiment, the recess has at least a wall which is at an angle to a bed surface, which angle is 20° to 80°, preferably 30° to 70°, in particular 45°, and this at a distance from the first header, which distance is 5% to 50%, preferably 10% to 20% of the length of the building brick. Owing to this inclining wall, the excess binding mortar flows efficiently to the header of the building brick.

In a further embodiment of the invention, from at least one of the first bed surface or a second bed surface located opposite thereto, an upstanding edge can extend, which edge extends substantially along the two stretchers. According to a further elaboration of the invention, it is possible that the respective stretchers are interconnected by a further upstanding edge which extends along the second header, therefore the header which is located opposite the header provided with the recess. Therefore, this further upstanding edge connects the two upstanding edges which extend along the two stretchers, with these three upstanding edges forming, as it were, an integrated upstanding edge along, successively, a stretcher, a header and the next stretcher. When applying mortar between the bricks of courses of building bricks stacked on top of each other, such an upstanding edge ensures that the mortar is prevented from exiting or, in any case, that the mortar is prevented as much as possible from exiting.

According to a further elaboration of the building brick of the invention, it is possible that a projection extends from the second header,

which projection is designed to cooperate, in use, with the recess in the first header of a building brick located opposite thereto. It is preferred that the shape of the projection in the second header substantially corresponds with the shape of the recess in the first header so that in use, the projection of one building brick fits in the recess of the adjacent building brick. In other embodiments, it is possible that the projection and the recess cooperating therewith have different shapes and sizes, while it is always important that the projection fits in the recess. The projection can for instance have a convex shape and the recess a concave shape. Another option is that the projection has a semicircular shape and the recess a negative semicircular shape. Optionally, the shape of the projection can be smaller than the shape of the recess so that, in use, a space is left between the projection and the recess. What is prevented with such a projection that cooperates with a recess is that there is no view into a laid wall surface, especially when hardly any mortar, if at all, is applied between two adjacent building bricks in a row when setting up the wall surface. A connection between two adjacent building bricks provided with projection and recess furthermore provides an increased stability of the brickwork.

According to a further elaboration of the invention, it is possible that in at least one of the first and second bed surface, a further recess is provided which leads to at least one of the first and the second stretcher or that a projection extends from at least one of the first and the second stretcher. In other words, in one of the stretchers, a recess can be provided which may possibly continue into at least one of the bed surfaces. Alternatively, a projection can be provided on one of the stretchers. Such a building brick can then be placed substantially perpendicularly with regard to an embodiment of the building brick mentioned hereinabove. One of the headers of the first building brick is then placed opposite the recess or the projection on the stretcher of the second building brick. Thus, it is possible to form a neatly

finished corner in the brickwork where these building bricks can be placed one against the other with a minimal joint, preferably without joint.

The invention also relates to a building brick, more specifically a facing brick for brickwork with courses of building bricks stacked on top of each other which are bonded by means of a binding mortar so that the building bricks are separated from each other. This building brick has at least a first full stretcher with a length that corresponds with the length of the building brick and a height that corresponds with the height of the building brick. Preferably, this stretcher is visible in the brickwork. At least in a first bed surface, this building brick has a recess which extends preferably from a middle of the first bed surface towards the second bed surface, preferably through the building brick. The building brick is designed to be cut in half in use so that half a building brick can be utilized as end brick in brickwork, built up from building bricks according to any one of the preceding claims. Such a building brick can simply provide, in another manner, a neat corner finish in brickwork built up from building bricks according to the invention.

The invention also relates to a method for laying building bricks with two parallel stretchers, two parallel bed surfaces and two headers, wherein a recess is provided in a first bed surface, which recess leads to a first header, while a first course of building bricks is placed such that the stretchers extend in line with each other, while over the overlying bed surface of the first course of building bricks an excess of binding mortar is spread and then, on this binding mortar, a next, second course of building bricks is placed, while the building bricks are pressed on the binding mortar such that a joint with a predetermined thickness is obtained between the building bricks of the second course of building bricks and the underlying first course of building bricks and wherein the excess of binding mortar is forced to move via the recess of the first bed surface beyond the first header of a building brick.

According to an embodiment of this method, the excess binding mortar from the top of the overlying bed surface is thereby brought beyond the first header of a building brick of the second course of building bricks against an adjacent header of an adjacent building brick of the same, second course of building bricks, in order to fill, at least partly, the joint between two headers of the successive adjacent building bricks.

According to a preferred embodiment of this method, the excess binding mortar from the overlying bed surface is thereby brought beyond the first header of a building brick of a second course of building bricks and applied on this first header, so that when laying a next building brick in the same, second course of building bricks, this excess binding mortar fills at least partly the joint between the first header and an adjacent header of the next building brick.

According to a further preferred embodiment of this method, the excess binding mortar from the top of the overlying bed surface is thereby brought beyond the first header of a building brick of the first course, so that a head joint below the overlying bed surface, between the first header and an opposite header of a building brick located next to it in the same first course, fills up at least partly.

Other details and advantages of the invention will appear from the following description of an embodiment of the method and the device according to the invention; this description is used as an example only and does not limit the scope of the claimed protection; the reference numerals used hereinafter relate to the appended Figures.

Figs. 1 - 4 are schematic, perspective representations of a first, second, third and fourth embodiment of a building brick according to the invention wherein a header is provided with a recess which extends into a bed surface.

Figs. 5 and 6 are schematic, perspective representations of a fifth and sixth embodiment of a building brick according to the invention wherein the recess shows a recessed surface as binding zone.

Fig. 7 is a schematic, perspective representation of a seventh embodiment of a building brick according to the invention, wherein both headers are provided with a recess and wherein this is provided with a recessed surface as binding zone.

Fig. 8 is a schematic, perspective representation of an eighth embodiment of a building brick according to the invention.

Fig. 9 is a schematic, perspective representation of a ninth embodiment of a building brick according to the invention wherein a recess is formed by a depression which extends in a bed surface.

Fig. 10 is a schematic, perspective representation of an embodiment of a building brick according to the invention.

Fig. 11 is a schematic top plan view of an embodiment of a building brick according to the invention.

Fig. 12 is a schematic top plan view of an embodiment of a building brick according to the invention.

Fig. 13 is a schematic top plan view of a further embodiment of a building brick according to the invention.

Fig. 14 is a schematic representation of brickwork illustrating a first method according to the invention, wherein building bricks provided with a recess are laid facing upwards.

Fig. 15 is a schematic representation of brickwork illustrating a second method according to the invention, wherein building bricks are laid with one bed surface provided with a recess downwards, with a header in which this recess extends remote from a previous building brick of the same course of building bricks.

Fig. 16 is a schematic representation of brickwork illustrating a third method according to the invention, wherein building bricks are laid with

a bed surface provided with a recess downwards, with a header in which this recess extends opposite a previous building brick of the same course of building bricks.

In the different Figures, the same reference numerals refer to the same or analogous elements.

The invention relates in general to a building brick, such as a brick, a facing brick, a quick brick, a concrete brick or silicate brick, and a method for traditional brickwork, wherein non-calibrated bricks are bonded onto each other by means of binding mortar, such as classic mortar, but also thin-bed mortar or mortar glue, where a joint is formed between the building bricks, and wherein both the bed joints and the head joints are filled at least in part with binding mortar. The invention relates in particular to a building brick and a method for such brickwork wherein the joints between the building bricks are minimal and wherein at least one stretcher is visible in the brickwork.

According to the invention it is preferred that use is made of building bricks where the width of the building brick is greater that the height of the building brick. Here, the distance between the stretchers of the building brick is greater than the distance between the bed surfaces.

In this building brick, according to the invention, a recess is provided, along which binding mortar flows towards an open, profiled header of the building brick. Optionally, according to the invention the recess can also be provided such that any excess binding mortar can be collected herein.

According to the invention, the recess can be provided at a header or at both headers of the building brick. Alternatively, at a header, a recess can be provided and, from the opposite header, a projection can extend, which is tailored with regard to shape and dimension to the recess such that the projection fits in the recess. At least one stretcher of the building brick, which is laid so as to be visible in the brickwork, should be intact, as is the case with a classic building brick. This is a full or closed stretcher. However, this

stretcher can optionally be provided with a decorative recess such as a false joint.

The recess ahs a wall which corresponds with the surface of the building brick in the recess. This wall may consist of several walls or surfaces which are at an angle to each other. For instance, a wall of the recess can have several surfaces linking up with each other which are each at an angle to the bed surface in which the recess extends, while the angle is smaller for a surface located closer to the bed surface than for a surface located further away from this bed surface.

The walls of the recess have an inclination with respect to the horizontal bed surface for efficiently guiding binding mortar to the open header of the building brick. For instance, the wall of the recess can also be curved, exhibiting an angle of inclination which varies from 0° to 90°.

In an alternative embodiment, the wall of the recess can be substantially perpendicular to the horizontal bed surface.

The depth of the recess along a direction which is perpendicular to the bed surface can vary, and can be as great as the complete height H of the building brick. In the building brick, the depth of the recess decreases according as the distance to the header towards which the recess extends increases.

The walls of the recess can be smooth or be provided with a relief for, for instance, increasing the contact surface for the binding mortar.

The recess according to the invention can be used in classic building bricks and facing bricks, so that the bricklayer no longer has to fill or scrape out the head joints.

The recess according to the invention can also be used in building bricks and facing bricks which are provided with a recessed surface for mortar with upstanding edges all around such as for instance the brick described in EP 1 983 122.

The brick can for instance comprise an upstanding edge which extends from the first bed surface along, for instance, the two stretchers. Optionally, the upstanding edges can be connected to each other at the second header by means of a further upstanding edge which extends from the first upstanding edge along the second header to the other upstanding edge. In the space between the upstanding edges, mortar can be received, wherein the edges at least prevent the mortar from flowing between the building bricks.

According to a special embodiment of the invention, one of the bed surfaces of the building brick is hollow, and the headers have a recess which links up with this hollow bed surface. Consequently, the building brick shows no upstanding edges, but large depressions in the building brick in which mortars sinks away. The recess or opening in the header allows mortar to flow to the head joint. Optionally, in this building brick too, upstanding edges can be provided in line with the stretchers and optionally also in line with a header for thus screening the layer of mortar.

In order that the head joints in brickwork between the building bricks fill up in a simple, automatic way, it is preferred that the diameter of the recess in the header and in the bed surface between which it extends is larger than the height of the building brick. For instance, the recess preferably extends in a first bed surface from a first header over a distance which is at least 50% the height of the building brick. The recess further preferably extends in the first header, from the first bed surface over a distance which is at least 50% of the height of the building brick.

For an optimal automatic filling, the recess extends in the building brick at least over a distance from the first header and from the first bed surface that is at least 50% the height of the building brick.

A **first embodiment** of a building brick according to the invention is represented in Fig. 1. It involves a building brick which has the shape of approximately a beam with a recess therein.

A first and a second stretcher 1 and 2 of the building brick are rectangles and have a height and a length which is equal to the height H and the length L, respectively, of the building brick. Preferably, these stretchers have no recesses, unless of a decorative nature, as these surfaces can be visible in the brickwork. Hereinafter, the stretchers 1 and 2 are also called full or closed stretchers 1 and 2.

A first header 3 of the building brick is profiled in that it shows a recess. In the following, this first header 3 is also called profiled header or open header 3.

A second header 4 of the building brick is a rectangle and has a height and a length that are approximately equal to the height H and the width B, respectively, of the building brick. Preferably, this header has no recesses, unless of a decorative nature, as this surface can be visible in the brickwork. In the following, this second header 4 is also called full or closed header 4.

A first bed surface 5 of the building brick is profiled in that this building brick has a recess 7. In the following, this first bed surface 5 is also called profiled bed surface 5.

A second bed surface 6 is approximately parallel to the first bed surface 5. The second bed surface is a rectangle and has a length and a width which are virtually equal to the length L and the width B, respectively, of the building brick. According to this embodiment, this second bed surface 6 has no recess and, in the following, is called full bed surface 6.

The building brick has a recess 7 which extends from the profiled header 3 into the profiled bed surface 5, over approximately the entire height H of the building brick and approximately 20% to 30% of the length L of the building brick. The recess 7 narrows towards the full bed surface 6.

The width of the recess 7 at the location of the boundary between the profiled header 3 and the profiled bed surface 5 is 50 to 90% of the width B of the building brick, preferably approximately 80%. The recess 7 in the building

brick does not extend into the full stretchers 1 and 2, so that they remain intact.

The recess 7 in the building brick has a conical wall which has an inclination which is 10° to 90°, preferably approximately 45°, with regard to the bed surface 5 and 6. The diameter of the recess 7 decreases from the full bed surface 6 to the profiled bed surface 5.

A **second embodiment** of a building brick according to the invention is represented in Fig. 2 and differs from the first embodiment only in that the recess 7 has the shape of a pyramid with a rectangular base which extends in the profiled bed surface 5. Thus, the recess 7 has three walls which are at an inclination of 10° to 90°, preferably approximately 45° with regard to the bed surface 5 and 6.

A **third embodiment** of a building brick according to the invention is represented in Fig. 3 and differs from the first embodiment in that the recess extends as far as into the second bed surface 6. In this second bed surface 6, the recess 7 has the shape of a semi-circle. The conical wall of the recess 7 merges into a cylindrical wall which is at an angle to the bed surface 5 and 6 which is approximately 90°. The height of the cylindrical wall is approximately 30% of the height H of the building brick. Thus, the inclination of the wall increases from approximately 45° to approximately 90° from the first bed surface 5 to the second bed surface 6.

A **fourth embodiment** of a building brick according to the invention is represented in Fig. 4 and differs from the second embodiment in that the recess 7 extends as far as the second bed surface 6. In this second bed surface 6, the recess 7 has the shape of a rectangle. The inclining walls of the recess 7 merge into straight walls which are approximately perpendicular to the bed surface 5 and 6. The height of the straight walls is approximately 30% of the height H of the building brick. Thus, the inclination of the wall increases from approximately 45° to approximately 90° from the first bed surface 5 to the second bed surface 6.

A **fifth embodiment** of a building brick according to the invention is represented in Fig. 5 and differs from the fourth embodiment in that the recess extends over virtually the entire first bed surface 5. As a result, the building brick has a recessed surface 8 with an upstanding edge all around which extends along the full stretchers 1 and 2 and the full header 4. The recessed surface 8 is approximately parallel to the bed surfaces 5 and 6. The recessed surface 8 forms a wall of the recess 7 which is at an inclination of 0° with regard to the bed surface 5 and 6. The recessed surface 8 also forms a binding zone for the binding mortar to which the binding mortar bonds for binding the building brick to a building brick located opposite thereto.

A **sixth embodiment** of a building brick according to the invention is represented in Fig. 6 and differs from the second embodiment in that the recess extends over almost the entire first bed surface 5, analogous to the fifth embodiment. As a result, the building brick has a recessed surface 8 with an upstanding edge all around which extends along the full stretchers 1 and 2 and the full header 4. In this embodiment, the recessed surface 8 is oblique with regard to the bed surface 5 and 6 and slopes down to the profiled header 3. The recessed surface 8 forms a wall of the recess 7 which is at an angle of approximately 10° with regard to the bed surface 5 and 6. The cross section of the recess 7, parallel to the headers 3 and 4, increases according as the distance to the profiled header 2 decreases.

A **seventh embodiment** of a building brick according to the invention is represented in Fig. 7 and differs from the fifth embodiment in that the recess 7 extends into the second header 4.

Further, the recess does not extend into the second bed surface 6 nor does it narrow towards this second bed surface 6. In a variant of this seventh embodiment, the recess 7 could indeed extend into the second bed surface 6, as is the case in the third, fourth and fifth embodiments.

An **eighth embodiment** of a building brick according to the invention is represented in Fig. 8 and differs from the seventh embodiment in

that at the headers 3 and 4, the recess 7 extends over the entire height H of the building brick. Further, the surface of the building brick in the recess 7 is convex from the first header 3 and from the second header 4 as far as a distance which is approximately 30% of the length of the building brick. The surface of the building brick in the recess 7 lying therebetween is virtually parallel to the first and the second bed surface 5 and 6 and is recessed into the building brick to a depth of the first bed surface 5 which is approximately 20% of the height H of the building brick.

A **ninth embodiment** of a building brick according to the invention is represented in Fig. 9 and differs from the previous embodiments in that it has a depression in the first bed surface 5. According to this special embodiment of the invention, the first bed surface 5 of the building brick is hollow and the headers 3 and 4 show a recess that links up with this hollow bed surface 5. Consequently, the building brick shows no upstanding edges but large depressions in the building brick in which mortar sinks away. The recess in the header 3 and 4 allows mortar to flow to a head joint. Possibly, in this building brick too, upstanding edges can be provided in line with the stretchers 1 and 2 and optionally also in line with a header 4 to thus screen off the layer of mortar.

Further, with an embodiment of the building brick according to the invention, the recess 7 can be designed such that, upon tapping the overlying building brick, it can collect the excess binding mortar at least partly so that it is not expelled.

To this end, the recess 7 has a binding zone, for binding the binding mortar 10 to the bed surface 5, and an adjacent overflow zone which is recessed in the recess 7 in the building brick, for discharging excess binding mortar in the building brick.

The binding zone preferably has a horizontal surface which is 50% to 70% of the surface of the bed surface (5), while the overflow zone preferably has a surface which is 30% to 20 % of the surface of the bed surface 5.

The binding zone is recessed in the building brick to a depth which is 0% to 30% of the height H of the building brick, while the overflow zone is recessed in the building brick to a depth which is 30% to 70% of the height H of the building brick.

A **tenth embodiment** of a building brick according to the invention is shown in Fig. 10. This embodiment of the building brick differs from the fifth embodiment as shown in Fig. 5 in that the recess 7 extends from the first bed surface 5 to the second bed surface 6, while the depth d along the entire height H of the building brick is substantially equal. The depth d is defined by the distance from the header 3 to the edge of the recess viewed in a direction parallel to the bed surface 5. In this example, the shape of the recess 7 in the first bed surface 5 is a trapezoid, with the longest side thereof extending along the first header 3. In other exemplary embodiments (not shown) the recess can have other shapes, as is already described with previous embodiments. The depth d can, for instance, vary along the height H. Also, the width of the recess 7 can vary along the height. Also, the depth D viewed in a direction perpendicular to the bed surface 5 can vary. At the second header 4 located opposite the first header 3 a projection 17 extends. This projection 17 also has a trapezoid shape and is designed for cooperation with the recess 7 of a further brick which is placed in line with the brick. The dimensions of the projection 17 are preferably slightly smaller than the dimensions of the recess so that the projection 17 can be placed with a small intermediate space in the recess 7. When the recess 7 has a form different from the one shown in Fig. 10, the projection 17 can also have a different form, adjusted to the shape of the recess 7. Preferably, the projection 17 is designed such that it can be completely received in the recess 7. Using such a projection 17 in cooperation with the recess 7, the view through the wall surface is obstructed with a processing method with little or no mortar between two building bricks placed in line in the same course of building bricks. Another thing is that the building bricks thus engaging each other provide stability to the brickwork. Further, from the

first bed surface 5 along both stretchers 1, 2 two substantially parallel proceeding upstanding edges 18 extend. These edges 18 enclose, at least partly, a receiving surface for receiving an amount of mortar. These edges prevent, at least partly, the mortar from exiting so that the aesthetic appearance of the brickwork formed by the building bricks is not affected.

In Fig. 11, a **further embodiment** of a building brick according to the invention is shown. This building brick can be used during effecting brickwork from the building bricks as shown in Fig. 10 for effecting a corner joint. To that end, the building brick comprises a first bed surface 5 provided with an upstanding edge 18 which extends from the bed surface 5 away from the second bed surface 6. The upstanding edge 18 extends along the two stretchers 1, 2 as well as along the two headers 3, 4. In the centre of the bed surface 5 there is a recess 7 which extends from the first bed surface 5 towards the second bed surface 6, preferably through the entire building brick, therefore along the entire height H. The recess 7 comprises a first recess part 7a which, as regards shape and dimensions, can coincide with the recess 7 of the building brick of Fig. 10. Other shapes and dimensions are possible too. Here, the recess 7 further comprises a second recess part 7b which is defined by contours of the first recess part which are mirrored with respect to the centre surface M which extends parallel, preferably at an equal distance, between the two headers 3, 4. In use, this building brick can be cut into halves, for instance by sawing it in half, preferably along the centre surface M. As a result, two corner stones are obtained which have half a length L.

An alternative embodiment of a building brick for forming a corner joint is shown in Fig. 12. This building brick differs from the building brick shown in Fig. 10 in that no projection is provided at the second header, but in that the two upstanding edges 18 are interconnected by a further upstanding edge 18' which extends from the first upstanding edge along the second header 4 to the second upstanding edge 18. Further, in the bed surface 5, a further recess 27 is provided which leads to at least one of the stretchers 1, 2, in this

example the second stretcher 2. This further recess 27 is designed to cooperate with the recess 7 of a further building brick placed perpendicularly thereto in the embodiment as shown in Fig. 10. Alternatively, the recess 27 can be designed to cooperate with a projection 17. Instead of the further recess 27, also, a further projection can be provided which extends from one of the stretchers. In turn, when the building brick is placed perpendicularly relative to a further building brick, this projection can cooperate with a recess 7 in this further building brick. The embodiment shown of the building brick in Fig. 12 provides a corner joint from an entire building brick with a length L. Both shown and described corner joints form a pretty, aesthetic whole with the rest of the brickwork.

The different building bricks according to the invention can be manufactured, inter alia, with the aid of a mould, a so-called moulding tray. The moulding tray comprises a negative of the profiled top of the building brick. The basic material, for instance clay, will be fed into the entire content of the moulding tray. The, the formed, but still wet building brick will be taken from the moulding tray and already has the desired final form before it is dried. Optionally, the different building bricks can be manufactured in another, suitable manner.

The different building bricks according to the invention can be laid into brickwork in different manners.

The invention further relates to a number of methods with which the above-mentioned building bricks are laid in a so-called jointless manner, with minimal joints or with classic joints, in a way in which the head joints are filled with binding mortar in a simple manner.

The processing of the building bricks requires no special skills. The binding mortar is applied by a skilled person in virtually the same way as with the traditional building bricks. The advantage of a method according to the invention is that the head joints in the mortar fill up almost automatically.

Thus, for instance, the overlying bed surface of the building bricks of a first course of building bricks can be provided with binding mortar, whereupon the building bricks of a following, second course are provided thereon while binding mortar is applied automatically in the joints by pressing on the building bricks of this second course.

According to a **first method** of the invention, as schematically represented in Figs. 13 and 14, building bricks, in particular bricks and facing bricks such as the above-mentioned embodiments of the building bricks, are laid for effecting, for instance, brickwork with classic joints, with a thickness V which is approximately 12 mm, or brickwork with thin joints, with a thickness V which is approximately 3 to 6 mm, or so-called jointless brickwork with glued joints.

With this method, an amount of binding mortar 10 is applied to the profiled bed surfaces 5 of a course of building bricks which form a top of a first course of building bricks 11. The binding mortar can consist of, for instance, classic mortar, thin-bed mortar of mortar glue, depending on, for instance, the desired thickness of the joints.

Here, the binding mortar 10 sinks into the recesses 7 in the building bricks, from the bed surfaces 5 to the profiled headers 3, and fills the corresponding head joints 9 between the building bricks at least partly.

On this binding mortar 10, a second course of building bricks 12 is placed. When placing a building brick of this second course 12, the second bed surface 2 of the building brick is put on the binding mortar 10 and pressed down to the desired distance V from the first course 11. Here, the excess binding mortar 10 is pressed via the recess 7 to the header 3. Consequently, excess binding mortar 10 moves from the bed surface 5 into the corresponding, underlying head joint 9 so that this head joint 9 is further filled up at least partly, preferably over the entire height H of the building brick.

On the corners of the brickwork, such as the corner of a building, preferably, each time, a building brick is used with at least one closed, full

header 4, which is placed so as to be visible at the outside of the brickwork. The profiled head 3 and recess 7 are preferably placed at the inside, in the brickwork.

An object of the invention is therefore to have the binding mortar 10, which binds the different building bricks in the brickwork upon application thereof to the top of the building brick, sink into the recess 7 to thus fill up the head joints 9 between the building bricks.

Furthermore, the recess 7 can be designed such that with it, it is also possible when the overlying building brick is tapped on, to collect the excess binding mortar so that it is not completely expelled to the head joints 9. To this end, in the recess 7, a recessed surface 8 can be provided which also forms a binding zone for the binding mortar. Thus, it is possible to process the building bricks as is the case with traditional brickwork but with a thinner joint as the mortar bed is recessed into the building brick. Preferably, here, the building brick has two full stretchers so that, in addition to a full header, it has two usable "sight" sides.

According to a **second method** of the invention, as schematically represented in Figs. 13 and 15, building bricks, in particular bricks and facing bricks such as the above-mentioned first to fourth embodiments of the building bricks, are laid onto each other for effecting classic brickwork with classic joints with a thickness V of, for instance, approximately 12 mm.

With this method, an amount of binding mortar 10 is applied on a first course of building bricks 11. The binding mortar 10 can consist of, for instance, classic mortar. A first profiled bed surface 5 of a first building brick is provided thereon. When tapping this first building brick, it is pressed towards the first course of building bricks 11 until a desired joint thickness V between this first building brick and the first course of building bricks is obtained. Here, excess binding mortar 10 is pressed via a recess 7 of the profiled bed surface 5 to a profiled header 3 of the first building brick. Then, in an analogous manner, a second building brick is placed next to the first building

brick with a full header 4 of the second building brick opposite the profiled header 3 of the first building brick. As a result, a butt 9 between the first and second building brick is formed which is filled with the excess binding mortar 10. Consequently, according to this method, it is not required that binding mortar 10 is applied in a separate operation on the header of the building bricks.

According to a variant of the second method of the invention, the building bricks are glued for effecting so-called jointless brickwork. With this method, mortar glue is applied as binding mortar to the first course of building bricks. When pressing on the building bricks, the mortar glue is pressed via the recess 7 to the profiled header 3 so that the headers of the building bricks too are glued to each other, without it being required that, separately, mortar glue is applied thereon.

According to another variant of the second method of the invention, building bricks, in particular bricks and facing bricks such as the above-mentioned fifth and sixth embodiments of the building bricks, are laid for effecting so-called jointless brickwork with minimal joints with a thickness of, for instance, less than 6 mm or even less than 3 mm.

With this method, the binding mortar 10 sinks virtually completely into the building brick as far as the recessed surface 8 so that the joint between the first and second course of building brick becomes minimal. The binding mortar 10 can consist of, for instance, classic mortar. The upstanding edges which extend along the full stretchers 1 and 2 also prevent excess binding mortar from being pressed away along the full stretchers.

As the recess 7 in the building brick continues over almost the entire length L of the building brick, so-called jointless brickwork can be obtained with classic mortar. In this case, the building brick is preferably laid with the recess 7 downward on the applied mortar and with the closed header 4 against the previous building brick of the same course of building bricks. When

tapping the building brick on the mortar, the excess mortar can exit via the open header 3.

According to variant to the above-mentioned methods, the recess 7 can furthermore be designed such that it is possible, when tapping the overlying brick, that the excess binding mortar is collected so that this is not expelled. Thereto, the excess binding mortar is pressed in a second recess in the building brick. This second recess is recessed into the building brick and links up with a binding zone so that excess binding mortar can flow from the top of the binding zone into this second recess.

According to a **third method** of the invention, as schematically represented in Figs. 13 and 16, building bricks, in particular bricks and facing bricks such as the above-mentioned embodiments of the building bricks, are laid on top of each other for effecting classic brickwork with classic joints with a thickness V. This method differs from the second method in that a building brick with a recess 7 is laid against the previous building brick of the same course of building bricks. Thus, a butt is formed between the header 3 of this building brick and the previous building brick. In Fig. 13, the header 3 with recess 7 is laid against the full header 4 of the previous building brick. When tapping the building brick, the excess mortar 10 moves away via the recess 7 to the butt 9.

Naturally, the invention is not limited to the above-described method and embodiments of building bricks proposed in the accompanying Figures.

For instance, the different elements of the embodiments described specifically hereinabove of building bricks and methods can be combined with each other.

For instance, the full stretchers and also the full header, which are intended to be visible in the brickwork, can optionally show a decorative recess such as a false joint.

The building brick can have, for instance, a second, analogous recess which extends from in the first and/or the second bed surface to the second header for discharging binding mortar from the top of the first/and or the second bed surface via the second recess to the second header. For instance, this second recess, which extends into a second header, can have a wall which is at an angle to a bed surface, which angle is 20° to 80°, preferably 30° to 70°, in particular 45°, and this at a distance from the second header, which distance is 5% to 50%, preferably 10% to 20% of the length L of the building brick. These recesses can thus be connected to each other via a recess.

Claims

1. A building brick, more particularly a facing brick for brickwork with courses of building bricks stacked on top of each other which are bonded by means of a binding mortar whereby the building bricks are separated from each other, wherein this building brick has at least a first full stretcher (1) with a length which corresponds with the length (L) of the building brick and a height which corresponds with the height (H) of the building brick, wherein this stretcher (1) is visible in the brickwork, **characterized in that**, at least in a first bed surface (5), this building brick has a recess (7) which leads to at least a first header (3) of the building brick, wherein this recess allows the binding mortar to be guided from the first bed surface (5) via the recess (7) to the first header (3) when laying the building brick in brickwork.

2. A building brick according to claim 1, wherein this is a building brick formed in a moulding tray, such as a hand-formed brick or a moulded brick.

3. A building brick according to claim 1 or 2, wherein the depth (D) of the recess (7), along a direction perpendicular to the bed surface (5), decreases according as the distance to the header (3) increases.

4. A building brick according to claim 1 or 2, wherein the depth (d) of the recess (7), along a direction parallel to the bed surface (5) with respect to the header (3), is substantially equal along the entire height (H) of the building brick.

5. A building brick according to any one of claims 1 – 4, wherein said recess (7) extends over

- at least 50%, preferably at least 70%, in particular at least 90% of the width (B) of the building brick;
- at least 10%, preferably at least 20%, in particular at least 50% of the length (L) of the building brick;

- at least 50%, preferably at least 90%, in particular 100% of the height (H) of the building brick.

6. A building brick according to any one of claims 1 – 5, wherein the recess (7) extends over

- at least 20%, preferably at least 50%, in particular at least 80% of the surface of the first bed surface (5) of the building brick;

- at least 20%, preferably at least 50%, in particular 90% of the surface of the first header (3) of the building brick.

7. A building brick according to any one of claims 1 – 6, wherein the recess (7) is bounded by at least a wall which is at an angle to said bed surface (5), which angle is between approximately 20° and 80°, preferably between approximately 30° and 70°, and in particular in the order of 45°.

8. A building brick according to any one of claim 1 – 7, wherein the wall of the recess (7) is at an angle to the first bed surface (5) which increases from a middle of the building brick as far as the first header (3).

9. A building brick according to any one of claims 1 – 8, wherein the recess (7) has at least a wall which is at an angle to a bed surface (5, 6), which angle is 20° to 80°, preferably 30° to 70°, in particular 45°, and this at a distance from the first header (3), which distance is 5% to 50%, preferably 10% to 20%, of the length (L) of the building brick.

10. A building brick according to any one of the preceding claims, wherein parallel to the first stretcher (1), the brick has a second, full stretcher (2) with a length which corresponds with the length (L) of the building brick and a height which corresponds with the height (H) of the building brick.

11. A building brick according to any one of the preceding claims, wherein the cross section of the recess (7) parallel to the first header (3) decreases according as the distance to the first header (3) increases.

12. A building brick according to any one of the preceding claims, wherein from at least one of the first bed surface (5) or a second bed surface

located opposite thereto, an upstanding edge (18) extends, which edge extends substantially along the two stretchers.

13. A building brick according to claim 12, wherein the upstanding edges along the respective stretchers are interconnected by a further upstanding edge (18') which extends along the second header.

14. A building brick according to any one of the preceding claims, wherein from the second header, a projection (17) extends, which projection is designed to cooperate in use with the recess in the first header of a building brick located opposite thereto.

15. A building brick according to any one of the preceding claims, wherein on at least one of the first and the second stretcher (1, 2) a further recess (27) is provided, which preferably leads into the first bed surface (5) and/or into the second bed surface located opposite thereto or wherein at least from one of the first and the second stretcher (1, 2), a projection extends.

16. A building brick according to any one of the preceding claims, wherein the recess (7) has a binding zone for binding the binding mortar, and an adjacent overflow zone which is recessed in the recess in the building brick, for discharging excess binding mortar in the building brick.

17. A building brick according to claim 16, wherein

the binding zone has a horizontal surface which is 50% to 70% of the surface of the bed surface (5),

the overflow zone has a horizontal surface which is 30% to 20% of the surface of the bed surface (5),

the binding zone is recessed in the building brick to a depth which is 0% to 30% of the height (H) of the building brick, and

the overflow zone is recessed in the building brick to a depth which is 30% to 70% of the height (H) of the building brick.

18. A building brick, more particularly a facing brick for brickwork with courses of building bricks stacked on top of each other which are bonded by means of a binding mortar whereby the building bricks are separated from

each other, wherein this building brick has at least a first full stretcher (1) with a length which corresponds with the length (L) of the building brick and a height which corresponds with the height (H) of the building brick, wherein this stretcher (1) is visible in the brickwork, **characterized in that** this building brick has at least in a first bed surface (5) a recess (7) which preferably extends from a middle of the first bed surface (5) towards the second bed surface (6), preferably through the building brick, wherein this building brick is designed to be halved in use such that half a building brick can be used as end brick in brickwork built up from building bricks according to any one of the preceding claims.

19. A building brick according to claim 18, wherein the recess comprises a first recess part (7a) in correspondence with the recess of the building brick according to any one of claims 1 – 12, wherein the recess further comprises a second recess part (7b) which is defined by contours of the first recess part mirrored with respect to the middle plane (M) which extends parallel between both headers.

20. A building brick according to claim 18 or 19, wherein from the first bed surface (5) an upstanding edge (18) extends, which edge extends at least along a stretcher and a header, more particularly along both stretchers and both headers.

21. Brickwork with building bricks according to any one of the preceding claims which form courses (11, 12) stacked on top of each other, wherein these building bricks are bonded to each other by means of a binding mortar (10), such as glue or mortar, which binding mortar (10) also separates the building bricks from each other, wherein the first header (3) of a building brick stands opposite a header or a stretcher of an adjacent building brick from the same course and forms a head joint (9) located therebetween which is filled with binding mortar (9).

22. A method for laying building bricks, preferably according to any one of claims 1 – 17, with two parallel stretchers (1, 2), two parallel bed surfaces

(5, 6) and two headers (3, 4), wherein a recess (7) is provided in a first bed surface (5), which recess (7) leads to a first header (3), wherein a first course of building bricks (11) is placed such that said stretchers (1) extend in line with each other, wherein over an overlying bed surface of the first course of building bricks (11) an excess of a binding mortar (10) is spread and thereupon, on this binding mortar (10), a next, second course of building bricks (12) is placed, wherein the building bricks are pressed on the binding mortar (10) such that a joint with a predetermined thickness (V) is obtained between the building brick and the underlying, first course of building bricks (11), characterized in that the excess of binding mortar (10) is forced to move via the recess (7) of the first bed surface (5) beyond the first header (3).

23. A method according to claim 22 for laying a building brick and effecting brickwork, wherein an amount of binding mortar (10) is applied to a first bed surface (5) of a first building brick which is in line with a first bed surface (5) of a second building brick in a first course of building bricks (11), characterized in that the binding mortar (10) flows partly to a first header (3) of the first building brick through at least a recess (7) in the first building brick, which extends from in the first bed surface (5) into the first header (3), so that binding mortar (10) partly fills a head joint (9) between the first header (3) of the first building brick and a header (4) located opposite thereto of the adjacent, second building brick.

24. A method according to claim 23, wherein a bed surface (6) of a third building brick is provided on the binding mortar (10) which is applied to the first course of building bricks (11), wherein the third building brick overlaps at least partly with the first building brick, whereupon the third building brick is pressed on until a desired joint thickness (V) of a horizontal joint between the third building brick and the first course of building bricks (11) is achieved, wherein the binding mortar (10) is partly pressed to the first header (3) of the first building brick through the recess (7) in the first building brick.

25. A method according to claim 22 for laying a building brick and effecting brickwork, wherein an amount of binding mortar (10) is applied to a first course of building bricks (11), and a first bed surface (5) of a first building brick is provided thereon, whereupon the first building brick is pressed on until a desired joint thickness (V) of a horizontal joint is achieved between the first building brick and the first course of building bricks (11), characterized in that the binding mortar (10) is partly pressed to a first header (3) of the first building brick through at least a recess (7) in the first building brick which extends from in the first bed surface (5) into the first header (3), so that the first header (3) is provided with binding mortar (10).

26. A method according to claim 25, wherein a following amount of binding mortar (10) is applied to the first course of building bricks (11), next to the first header (3) of the first building brick, and a first bed surface (5) of a second building brick is provided hereon in line with the first bed surface (5) of the first building brick, whereupon the second building brick is pressed on until the desired joint thickness (V) of the horizontal joint is achieved between the second building brick and the first course of building bricks,

wherein the binding mortar is partly pressed to a first header (3) of the second building brick through at least a recess (7) in the second building brick which extends from in the first bed surface (5) into the first header (3), so that the first header (3) is provided with binding mortar (10),

and wherein the second building brick is further also pressed on until a desired joint thickness of a butt (9) is obtained between the first header (3) of the first building brick and a second header (4) of the second building brick, so that the binding mortar (10) at the first header (3) of the first building brick fills up the butt (9) at least partly, over the entire height (H) of the first building brick.

27. A method according to any one of claims 22 – 26, wherein a building brick according to claims 18 – 20 is halved so that a building brick is obtained with a shorter stretcher length than the stretcher length of the building bricks

according to any one of claims 1 – 17 of the brickwork, wherein an upstanding edge extends from the first bed surface along both stretchers and the header remote from the header with the recess formed through halving, wherein the halved building brick is placed next to a building brick according to any one of claims 1 – 17 in order to obtain a corner finishing.

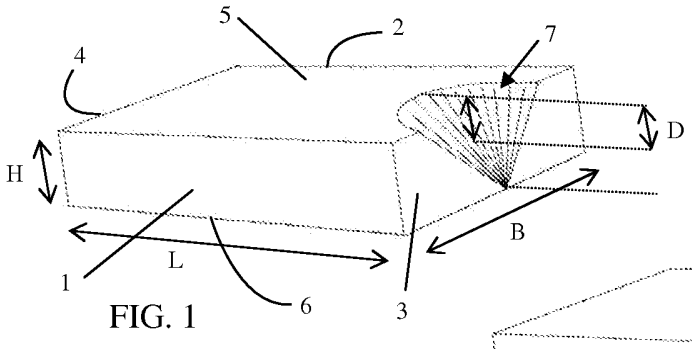

FIG. 1

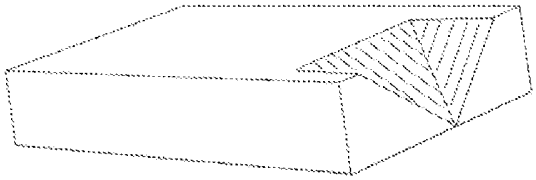

FIG. 2

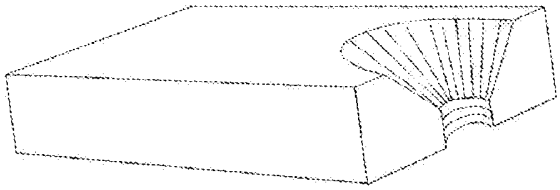

FIG. 3

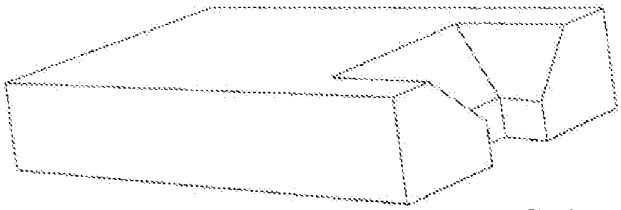

FIG. 4

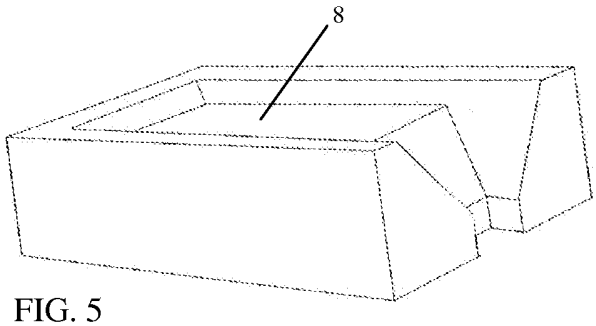

FIG. 5

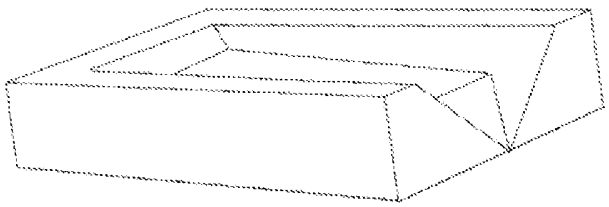

FIG. 6

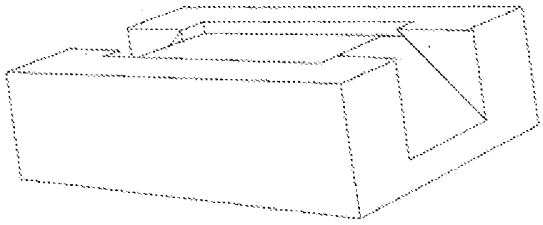

FIG. 7

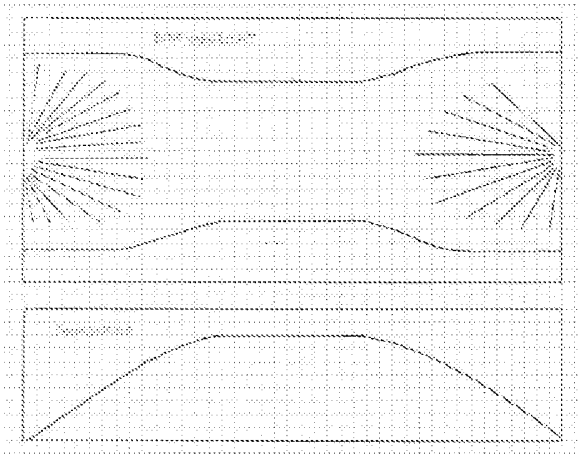

FIG. 8

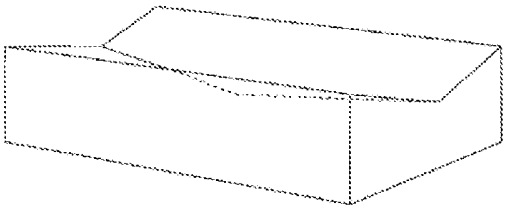

FIG. 9

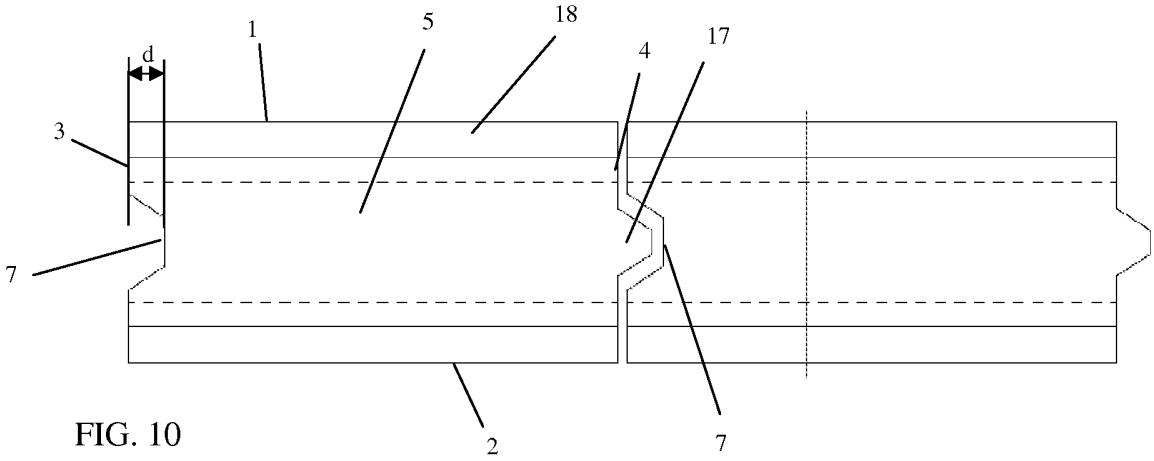

FIG. 10

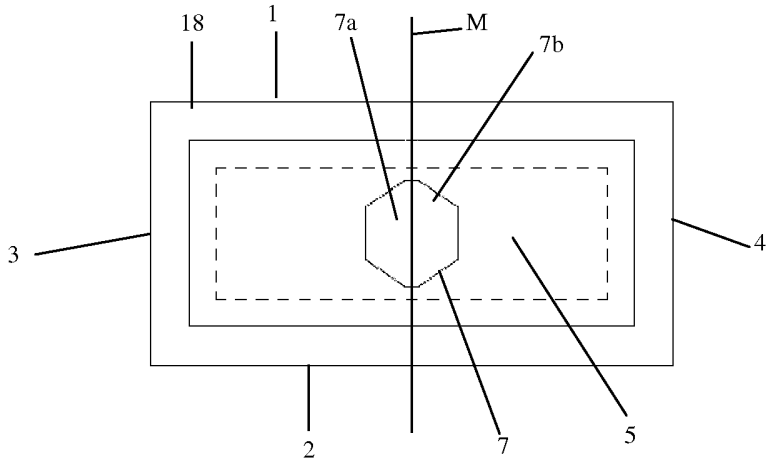

FIG. 11

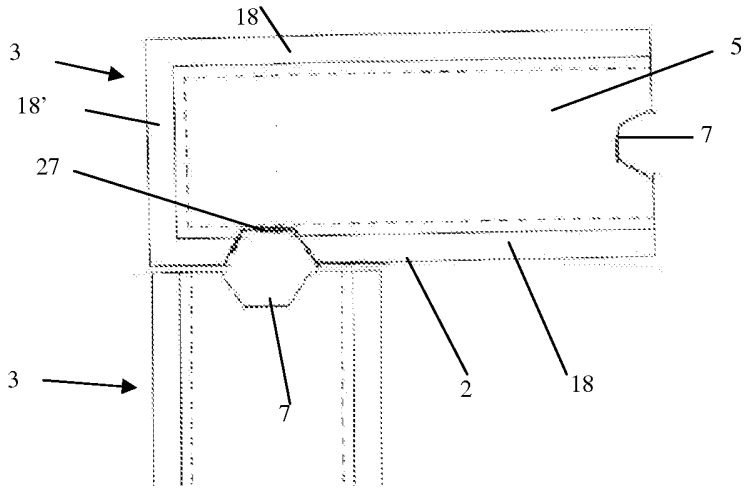

FIG. 12

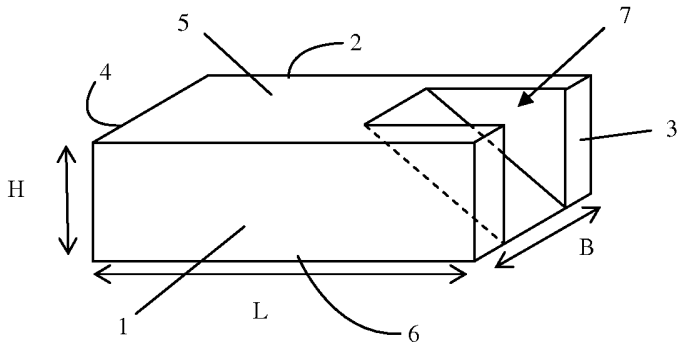

FIG. 13

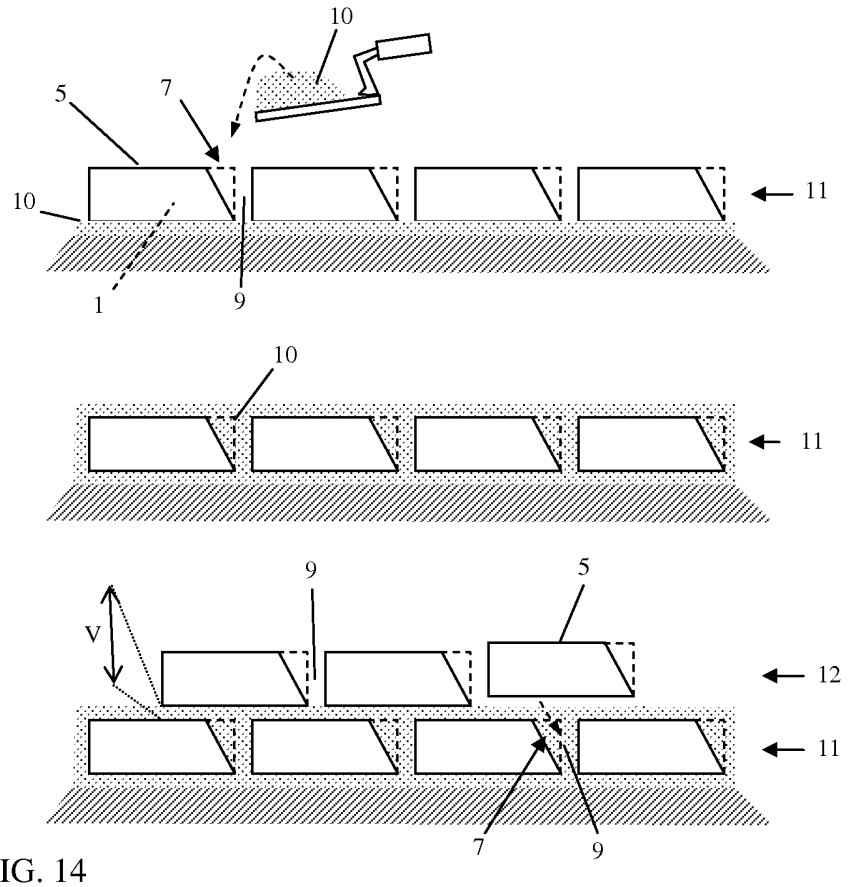

FIG. 14

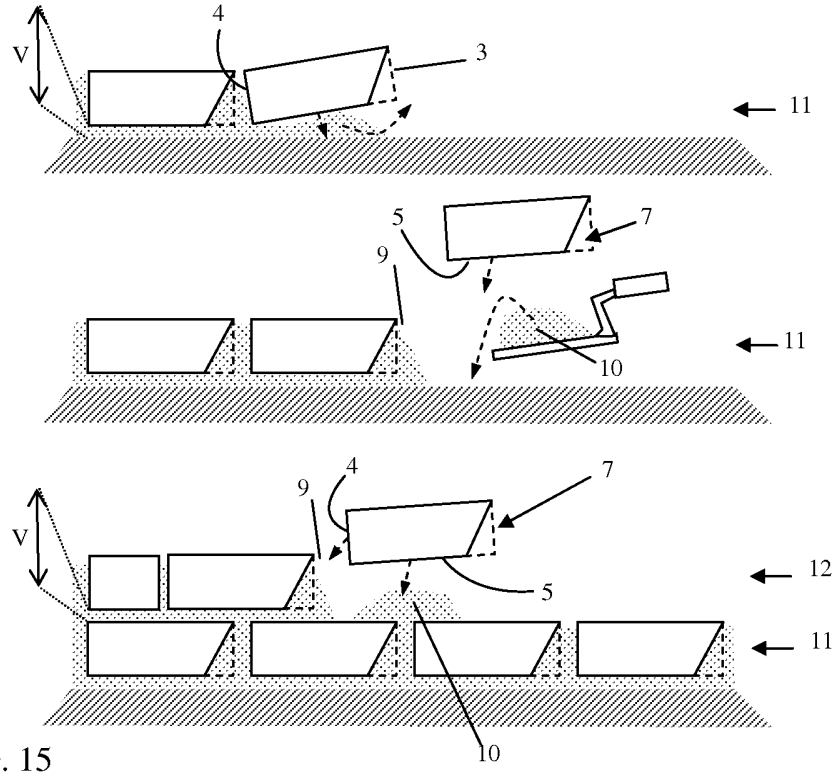

FIG. 15

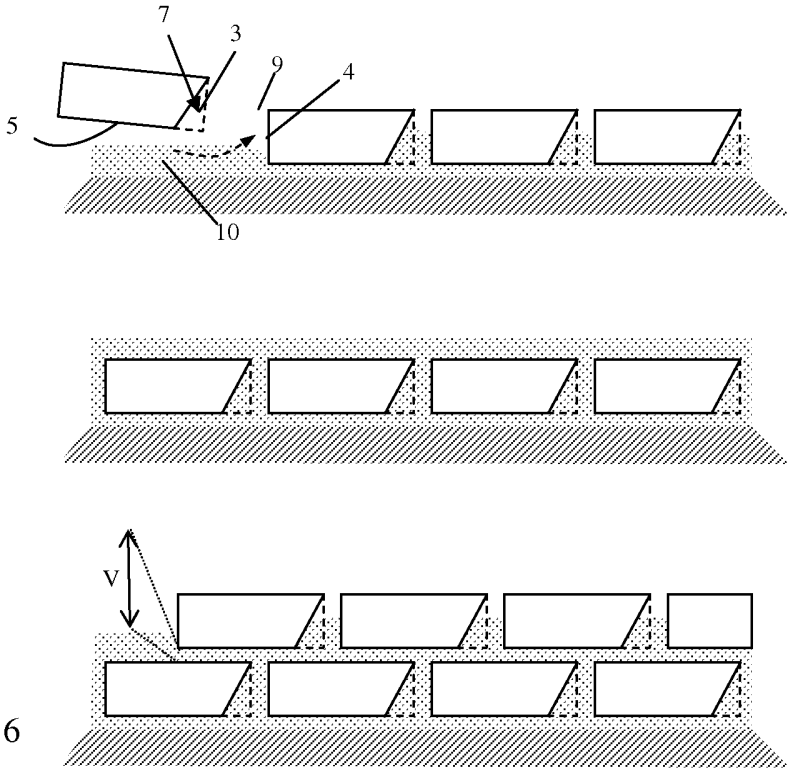

FIG. 16

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2011/050340

A. CLASSIFICATION OF SUBJECT MATTER
INV. E04B2/10
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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 603 202 A (HUGGETT J P) 18 November 1981 (1981-11-18)	1-3, 5-10, 21-26
Y	page 1, line 55 - page 2, line 35; figures 1-3	4,7, 11-17,27

X	DE 827 859 C (WILLY MESSERSCHMITT DR ING; NEUE TECHNIK G M B H) 14 January 1952 (1952-01-14)	1
Y	figures 1-3	4,7, 11-17

X	GB 2 381 016 A (CHAN KWOK PUN [GB]) 23 April 2003 (2003-04-23)	1
A	figures 1-3, 5-7	4,7

	-/--	

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
15 June 2011	24/06/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Mysliwetz, Wolfgang

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2011/050340

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1 597 670 A (HABEGGER C INGWERSEN A J; AHEARN T G) 9 September 1981 (1981-09-09) figures 2-4	12,13,20
A	BE 766 727 A1 (BENDER AUGUST H) 1 October 1971 (1971-10-01) figures 1-3	14,15
X	FR 1 388 068 A (DELOUPY) 5 February 1965 (1965-02-05)	18,19
Y	figures 1,2,5	27

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2011/050340

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GB 1597670 A	09-09-1981	NONE	
BE 766727 A1	01-10-1971	NONE	
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