HOLDEN FOR A WALL TIE

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ABSTRACT

The invention relates to a holder for a wall tie (100) designed to receive and hold a wall tie (400). The holder is provided with a first open-ended slot (208) and with a second open-ended slot. The first open-ended slot has a first open end and the second open-ended slot has a second open end. The first open-end and the second open-end are oriented in different directions. The holder according to the present invention allows quick and easy introduction of a wall tie in the holder. Furthermore the invention relates to a method to install a wall tie in a holder for a wall tie.
HOLDER FOR A WALL TIE

TECHNICAL FIELD

[0001] The invention relates to an improved holder for a wall tie. The invention also relates to a wall tie and to an assembly comprising a holder for a wall tie and a wall tie.

[0002] Furthermore the invention relates to a method to install a wall tie in a holder for a wall tie.

BACKGROUND ART

[0003] It is common practice to secure masonry walls, such as façades or load-bearing walls to a structural or supporting element such as a load-bearing wall or a column as for example a reinforced concrete column or any structural or supporting element known in the art. Securing a masonry wall to a structural or supporting element may be achieved by anchoring the wall to the structural or supporting element at regular vertical and horizontal intervals. To secure a wall to a structural or supporting element, the use of wall anchors is known in the art. Various embodiments of wall anchors are known in the art.

[0004] Examples of wall anchors are for example known from ES 1070021, US2007/0062138 and GB2395497.

[0005] ES1070021 describes a wall anchor comprising a holder for a wall tie having a rear portion and two side portions whereby both side portions are provided with an opening to hold the legs of a wall anchor tie. US2007/0062138 describes a holder for a wall tie comprising a rear portion (backing member) and a projection member defining a first and a second slot between the rear portion and the projection member.

[0006] For the holders for a wall tie described in ES 1070021 and US2007/0062138 the wall tie is introduced in the holder by first sliding the wall tie laterally through the first opening or slot and subsequently through the second opening or slot. This way of inserting the wall tie in the anchor is requiring time-consuming efforts from a mason.

[0007] GB2395497 describes a wall anchor comprising a holder for a wall tie having partially circular slots for receiving a correspondingly shaped portion of a wall tie made of a sheet of steel.

DISCLOSURE OF INVENTION

[0008] It is an object of the present invention to provide a holder for a wall tie avoiding the drawbacks of the prior art.

[0009] It is also an object of the present invention to provide a holder for a wall tie allowing quick and easy installing of a wall tie in the holder.

[0010] It is another object of the present invention to provide a method to install a wall tie in a holder for a wall tie.

[0011] It is a further object of the present invention to provide a holder for a wall tie that may be used to insert wall ties provided with at least one spacer element.

[0012] It is furthermore an object to provide an assembly comprising a holder for a wall tie and a wall tie.

[0013] According to a first aspect of the present invention a holder for a wall tie is provided. The holder is provided with at least a first open-ended slot and a second open-ended slot. The first open-ended slot and the second open-ended slot are designed for receiving and holding a wall tie.

[0014] The first open-ended slot has a first open end and the second open-ended slot has a second open end. The first open end of the first open-ended slot and the second open end of the second open-ended slot are orientated in different directions.

[0015] When the wall tie is installed in the holder, the wall tie is installed in both the first open-ended slot and the second open-ended slot.

[0016] The wall tie comprises preferably a wire.

[0017] The wall tie is preferably introduced in the holder by sliding the wall tie, for example the central portion of the wall tie, through the first open end in the first open-ended slot and through the second open end in the second open-ended slot.

[0018] More preferably, the wall tie is introduced in the holder by frontally sliding the wall tie through the first open end in the first open-ended slot and subsequently through the second open end in the second open-ended slot.

[0019] The easiness of installation of a wall tie in a holder according to the present invention is an important advantage of the holders according to the present invention compared to holders known in the art. Holders known in the art as described in ES 1070021 and US2007/0062318 require that the wall tie is introduced in the holder by laterally sliding the wall tie through a first opening and subsequently sliding the wall tie through a second opening. The introduction of a wall tie in the conventionally known holders is considered by a mason as a difficult, time-consuming and labour-consuming operation.

[0020] For the purpose of this invention, with “frontally sliding” is meant positioning the wall tie in front of the holder, for example against the front of the holder; and subsequently sliding the wall tie in the open-ended slots, either simultaneously or subsequently. The wall tie is thereby slid through the open end of an open-ended slot in the open-ended slot.

[0021] With “laterally sliding” is meant sliding the wall tie through an opening or slot from one side of the holder.

[0022] It is important to notice that “frontally sliding” is not possible in case the slots or openings do not have an open end.

[0023] With “slot” is meant an opening, preferably a narrow opening or a groove. With “open-ended slot” is meant a slot having an open end, i.e. a slot having an end with an opening that is allowing an object, such as a wire to be slid through the open end in the open-ended slot.

[0024] With “the first open end of the first open-ended slot and the second open end of the second open-ended slot being orientated in different directions” is meant that in case a first vector having a direction parallel to the longitudinal axis of the first open-ended slot and pointing towards the first open end is drawn in the first open-ended slot; and a second vector having a direction parallel to the longitudinal axis of the second open-ended slot and pointing towards the second open end is drawn in the second open-ended slot, either the direction or the orientation of the first and the second vector is different.

[0025] In a preferred embodiment the holder comprises a rear portion, a first side portion and a second side portion. The first side portion and the second side portion are preferably transverse to the plane of the rear portion. In this way the rear portion, the first side portion and the second side portion may define a channel, preferably a U-shaped channel.

[0026] For receiving a wall tie, the holder is provided with at least a first open-ended slot and a second open-ended slot.

[0027] Preferably, the first side portion is provided with the first open-ended slot and the second side portion is provided with the second open-ended slot. The wall tie can be introduced in the holder by sliding the wall tie, for example the central portion of the wall tie, in the first and the second open-ended slot.
In such embodiment the wall tie can for example be introduced by frontally sliding the wall tie through the first open end in the first open-ended slot and through the second open end in the second open-ended slots.

As mentioned above, the first open end (of the first open-ended slot) and the second open end (of the second open-ended slot) are oriented in different directions. In a preferred embodiment the first open end and the second open end are oriented in mutual opposite directions. The first open end is for example oriented to the upper side of the holder whereas the second open end is oriented to the lower side of the holder. A wall tie can be introduced in such an embodiment of a holder by sliding, preferably frontally sliding, one end of a wall tie downwards in the first open end slot and another end of a wall tie upwards in the second open end.

In a preferred embodiment the holder has a first side portion provided with a first open-ended slot with its open end (the first open end) oriented towards the upper side of the holder and a second side portion provided with a second open-ended slot with its open end (the second open end) oriented towards the lower side of the holder.

The open-ended slot or slots may have any shape. Preferably, the shape of the open-ended slots allows easy introduction of a wall tie in the holder. In addition it is preferred that the shape of the open-ended slots does not allow easy removal of the wall tie from the holder once the wall tie is introduced in the holder.

By using open-ended slots having a shape that at the one hand allows easy introduction of the wall tie in the holder and at the other hand makes it difficult to remove the wall tie from the holder once introduced, complex, toilsome and time-consuming operations to introduce the wall tie in the holder are avoided and at the same time the risk that the wall tie is removed or slipped out of the holder for example by accident is reduced to a minimum.

For a person skilled in the art it is clear that the open-ended slots may be provided with any kind of means to hold the wall tie in the open-ended slots once the wall tie is introduced in the slot. In preferred embodiments the open-ended slots can be provided with extensions as for example barbs to hold the wall tie in the open-ended slots once the wall tie is introduced in the slot.

The holder can be fixed to the structural element by any means known in the art, such as any anchoring means known in the art.

In a preferred embodiment the rear portion of a holder is provided with at least one slot for accepting at least one anchoring means. The slot of the rear portion is preferably an elongated slot allowing adjustable mounting of the holder to the structural element.

The holder according to the present invention is designed to receive and to hold a wall tie. The wall tie preferably comprises a wire, for example a bent or deformed wire.

The wall tie comprises for example a wire comprising at least a central portion, a first leg and a second leg, each of said first and second leg extending from the central portion. In some embodiments the first and second leg may have further legs (side legs) extending from the first and second leg.

The wall tie is preferably introduced in the holder by sliding the wall tie through the first open end in the first open-ended slot and through the second open end in the second open-ended slot.

Preferably, the wall tie is installed in the holder by sliding the wall tie frontally in the first open end and the second open end.

The wall tie can for example be introduced in the holder by sliding the central portion in the first open-ended slot and in the second open-ended slot.

The wire of the wall tie is preferably a steel wire. In particular embodiments the steel comprises stainless steel.

Possibly, the steel wire is coated, for example with a zinc or zinc alloy coating and/or with a polymer coating.

The wire may have any type of cross-section. Preferred wires have a circular cross-section, a rectangular or a square cross-section.

The reinforcement wires are preferably drawn wires, although wires made of sheet material and profiled wire can also be considered.

The equivalent diameter of the wire is preferably ranging between 2 and 6 mm, for example between 3 and 5 mm as for example 4 mm or 4.5 mm.

In a preferred embodiment a wall tie is provided with at least one spacer element. Examples of spacer elements comprise any kind of protuberance, extension or deformation of a wall tie or of part of a wall tie or any kind of clip such as a plastic clip that can be installed on a wall tie or on part of a wall tie.

In a particular embodiment, the wall tie is provided with one or more spacer element by bending the wire of the wall tie, for example by bending the first leg, the second leg, by bending the first and the second leg or by bending one or more of the further legs (side legs). The bent section or sections may for example have a sinusoidal form.

The spacer element keeps the wire of the wall tie at a specific distance from the layer of masonry below or from the layer of masonry above or from both the layer of masonry below and above in order to guarantee the complete embedding of the wall tie in the mortar.

The spacer element may create a specific distance at one or at both sides of the plane of the wall tie, for example at the upper side, at the lower side or at both the upper and the lower side of the wall tie.

A great advantage of a holder for a wall tie according to the present invention is that it allows the installation of wall ties provided with one or more spacer elements such as one or more protuberance(s), extension(s) or deformation(s) of a wall tie or part of a wall tie or any kind of clip.

The installation of wall ties provided with a spacer element in the holders known in the art is very difficult and complicated and is in some case even impossible. Wall ties provided with a spacer element can for example not or only with high difficulties be introduced in holders described in ES1070021.

According to a second aspect of the present invention an assembly comprising a holder for a wall tie and a wall tie is provided. The holder corresponds with a holder described above. The holder is designed to receive and hold the wall tie. The wall tie is introduced in the holder by sliding (preferably frontally sliding) the wall tie in the first open-ended slot and the second open-ended slot.

The wall tie comprises a wire, for example a bent or deformed wire.

The wall tie has preferably a central portion for being introduced and held in the holder. Preferably, the wall tie additionally has a first and a second leg each of said legs extending from the central portion.
In some embodiments the first and second leg may have further legs (side legs) extending from the first and second leg.

According to a third aspect of the present invention a wall tie suitable to be introduced in a holder for a wall tie as described above is provided. Preferably, the wall tie comprises at least a central portion, a first leg and a second leg, each of the first and the second leg extending from the central portion.

In a preferred embodiment a wall tie is provided with at least one spacer element. Examples of spacer elements comprise any kind of protruberance, extension or deformation of a wall tie or of part of a wall tie or any kind of clips such as a plastic clip that can be installed on a wall tie or on part of a wall tie.

In a particular embodiment, the wall tie is provided with one or more spacer element by bending the wire of the wall tie, for example by bending the first leg, the second leg, by bending the first and the second leg or by bending one of more of the further legs (side legs). The bent section or sections may for example have a sinusoidal form.

According to a fourth aspect of the present invention a method to install a wall tie in a holder for a wall tie is provided.

The method comprises the steps of

- providing a holder for a wall tie, said holder for a wall tie being provided with at least a first open-ended slot and a second open-ended slot, said first open-ended slot having a first open end and said second open-ended slot having a second open end;
- providing a wall tie;
- introducing said wall tie in said holder by sliding said wall tie through said first open end in said first open-ended slot and through said second open end in said second open-ended slot.

The sliding preferably comprises frontally sliding.

In case the holder has a first open-ended slot and a second open-ended slot with open ends oriented in opposite directions, the wall tie is introduced by sliding (preferably frontally sliding) one part of the wall tie downwards through the first open end in the first open-ended slot and another part of the wall tie upwards through the second open end in the second open-ended slot.

BRIEF DESCRIPTION OF FIGURES IN THE DRAWINGS

The invention will now be described into more detail with reference to the accompanying drawings where

- FIG. 1 and FIG. 2 are illustrations of holders for a wall tie according to the present invention;
- FIG. 3, FIG. 4, FIG. 5, FIG. 6 and FIG. 7 are illustrations of different embodiments of wall ties;
- FIG. 8, FIG. 9 and FIG. 10 are illustrations of assemblies comprising a holder for a wall tie and a wall tie.

MODE(S) FOR CARRYING OUT THE INVENTION

The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The drawings described are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated and not drawn on scale for illustrative purposes. The dimensions and the relative dimensions do not correspond to actual reductions to practice of the invention.

The terms first, second and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequence, either temporally, spatially, in ranking or in any other manner.

The following terms are provided solely to aid in the understanding of the inventions.

Masonry: all building systems that are constructed by stacking relatively small units of stone, clay, or concrete, joined by for example mortar or glue into the form of walls, columns, arches, beams or domes;

Equivalent diameter of a wire: the diameter of an imaginary wire having a circular radial cross-section, which cross-section has a surface identical to the surface area of the particular wire.

FIG. 1 is an illustration of a holder for a wall tie 100 according to the present invention. The holder 100 comprises a rear portion 102, a first side portion 104 and a second side portion 106. The first side portion 104 and the second side portion 106 are transverse to the plane of the rear portion 102. The first side portion 104 is provided with a first open-ended slot 108 having a first open end 109 and the second side portion 106 is provided with a second open-ended slot 110 having a second open end 111. In the embodiment shown in FIG. 1 the first open end 109 and the second open end 111 are oriented in mutual opposite directions, i.e. open-ended slot 108 has its first open end 109 oriented towards the upper side of the holder 100 whereas open-ended slot 110 has its open end 111 oriented towards the lower side of the holder 100.

The rear portion 102 of the holder 100 is preferably provided with a slot 120 allowing adjustably mounting of the holder 100 to the structural element.

FIG. 2 is a further illustration of a holder for a wall tie 200 according to the present invention. The holder 200 comprises a rear portion 202, a first side portion 204 and a second side portion 206. The first side portion 204 and the second side portion 206 are transverse to the plane of the rear portion 202. The first side portion 204 is provided with a first open-ended slot 208 having a first open end 209 and the second side portion 206 is provided with a second open-ended slot 210 having a second open end 211. As in the embodiment shown in FIG. 1, the first open end 209 and the second open end 211 are oriented in mutual opposite directions, i.e. open-ended slot 208 has its open end 209 oriented towards the upper side of the holder 200 whereas open-ended slot 210 has its open end 211 oriented towards the lower side of the holder 200.

To increase the strength of the holder 200, the rear portion may be provided with extensions 212, the extensions are preferably located close to the open-ended slots 208, 210.

Additionally or instead of the extensions 212, the side portions 204, 206 may be strengthened, for example by providing the side portions 204, 206 with ribs 216, 218.

The rear portion 202 of the holder 200 is provided with a slot 220 allowing adjustably mounting of the holder 200 to the structural element.

FIG. 3 shows a first embodiment of a wall tie 300. The wall tie 300 has a triangular shape and comprises a central portion 302 and at least two legs 304, 306.

FIG. 4 shows a second embodiment of a wall tie 400. The wall tie 400 has a shape similar to the shape of the wall tie of FIG. 3 and comprises a central portion 402, a first leg 404.
and a second leg 406. The first leg 404 and the second leg 406 are both provided with a spacer element 408, 410. In the embodiment shown in FIG. 4 the spacer elements 408, 410 comprise clips, such as plastic clips. The clips can be installed easily on the wall tie 400.

[0083] FIG. 5 shows a third embodiment of a wall tie 500. The wall tie 500 comprises a central portion 502, a first leg 504 and a second leg 506. The central portion 502 may comprise a straight section or—as the embodiment shown in FIG. 5—may comprise a bent structure.

[0084] FIG. 6 shows a fourth embodiment of a wall tie 600. The wall tie 600 comprises a central portion 602 and at least a first leg 604 and a second leg 606. The embodiment shown in FIG. 6 is similar to the embodiment shown in FIG. 5. Compared to the embodiment shown in FIG. 5, the first and second legs 604, 606 are provided with spacer elements 608, 610. The spacer elements are protruberances 608, 610, obtained by bending the first and second legs 604, 606.

[0085] FIG. 7 shows a further embodiment of a wall tie 700. The wall tie 700 comprises a central portion 702 and at least a first leg 704 and a second leg 706. The first leg 704 and the second legs 706 are provided with extensions 705, 707. These extensions 705, 707 are provided with a spacer element 708, 710. As spacer element any spacer element can be considered. In the embodiment shown in FIG. 7, the spacer elements are bent portions. Both bent sections 708, 710 shown in FIG. 7 are sections that are bent in the same direction, more particular sections 708, 710 are bent downwards. It is clear for a person skilled in the art that embodiments having a bent sections that are bent in mutual different directions can be considered as well. In particular an embodiment having a first bent section being bent upwards and another bent section being bent downwards can be considered.

[0086] FIG. 8 shows a first embodiment of an assembly comprising a holder for a wall tie 800 comprising a holder for a wall tie 200 and a wall tie 700. The holder 200 corresponds with the holder shown in FIG. 2 and the wall tie 600 corresponds with the wall tie shown in FIG. 6.

[0087] The wall tie 600 is introduced in the holder 200 by frontally sliding the wall tie 600, more particularly the central portion 602 in the first and second open-ended slots 208, 210. One end of the central portion 602 is slid downwards in open-ended slot 208, another end of the central portion 602 is slid upwards in open-ended slot 210.

[0088] FIG. 9 shows a second embodiment of an assembly comprising a holder for a wall tie 900 comprising a holder for a wall tie 100 and a wall tie 300. The holder 100 corresponds with the holder shown in FIG. 1; the wall tie 300 corresponds with the wall tie shown in FIG. 3.

[0089] The wall tie 300 is introduced in the holder 100 by frontally sliding the wall tie 300, more particularly the central portion 302 in the first and second open-ended slots 108, 110. One end of the central portion 302 is slid upwards in open-ended slot 108, the other end of the central portion 302 is slid downwards in open-ended slot 110.

[0090] FIG. 10 shows a further embodiment of an assembly comprising a holder for a wall tie 1000 comprising a holder for a wall tie 200 and a wall tie 700. The holder 200 corresponds with the holder shown in FIG. 2; the wall tie 700 corresponds with the wall tie shown in FIG. 7. The wall tie 700 is introduced in the holder 200 by frontally sliding the wall tie 700, more particularly the central portion 702 in the first and the second open-ended slots 208, 210. One end of the central portion 202 is slid downwards in open-ended slot 208, the other end of the central portion 202 is slid downwards in open-ended slot 210.

1-14. (canceled)
15. A holder for a wall tie, said bidder being provided with a first open-ended slot and a second open-ended slot, said first open-ended slot having a firm open end and said second open-ended slot having a second open end and said second open end being oriented in different directions, whereby said wall tie when installed in said holder is installed both in said first open-ended slot and in said second open-ended slot.
16. A holder for tie according to claim 15, wherein said wall tie comprises a wire.
17. A holder for a wall tie according to claim 15, wherein said first open end of said first open-ended slot and said second open end of said second open-ended slot are oriented in mutual opposite directions.
18. A holder for a wall tie according to claim 15, wherein said holder comprises a rear portion, a first side portion and a second side portion, said first side portion and said second side portion being transverse to the plane of the rear portion, said first side portion being provided with said first open-ended slot and said second side portion being provided with said second open-ended slot.
19. A holder for a wall tie according to claim 18, wherein said rear portion is provided with at least one slot for accepting at least one anchoring means for adjustably mounting said holder to said structural element.
20. An assembly comprising a holder for a wall tie as defined in claim 15 and a wall tie, said holder being designed to receive and hold said wall tie.
21. An assembly according to claim 20, wherein said wall tie comprises a wire.
22. An assembly according to claim 21, wherein said wall tie comprises a central portion and at least two legs.
23. An assembly according to claim 21, wherein said wall tie is provided with at least one spacer element.
24. An assembly according to claims 21, wherein said spacer element comprises at least one protruberance, extension, deformation or clip.
25. A wall tie suitable to be introduced in a holder for a wall tie as defined in claim 15, said wall tie comprising a wire, said wire comprising a central portion and at least two legs, whereby at least one of said legs is provided with at least one spacer element.
26. A method to install a wall tie in a holder for a wall tie as defined in claim 15, said method comprising the steps of providing a holder for a wall tie as defined in claim 15; said holder being provided with a first open-ended slot and a second open-ended slot, said first open-ended slot having a first open end and said second open-ended slot having a second open end; providing a wall tie; introducing said wall tie in said holder by sliding said wall tie through said first open end and in said first open-ended slot and through said second open end in said second open-ended slot.
27. A method according to claim 26, wherein said sliding comprises frontally sliding.
28. A method according to claim 27, wherein said wall tie is introduced in said holder by sliding one part of said wall tie downwards through said first open end in said first open-ended slot and by sliding another part of said wall tie upwards through said second open end in said second open-ended slot.