

METHOD FOR REPLACING AN EXISTING STONE PANEL IN A STONE PANEL WALL ARRANGEMENT ON A STRUCTURE WALL ELEMENT

5 The present application generally relates to a method for replacing an existing stone panel in a stone panel wall arrangement on a structure wall element, and more particularly to the technical field of stone panel installation and maintenance.

10 The US20190085567 discloses a stone panel having a rear, mounting face, a front, a decorative face, an upper surface having a raised section and a recess, and a lower surface. The upper surface and the lower surface of adjacent stone panels overlap to form a joint therebetween. At least one bracket extends from the stone body; a leftward extension on the stone body; and a rightward extension on the stone body, such that the leftward extension and rightward extension of adjacent stone panels form a joint therebetween.

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This application addresses the problem of replacing existing stone panels in a stone panel wall arrangement on a structure wall element.

This and other objects are solved by the subject matter of the independent claims.

20 Further improvements are given by the dependent claims.

The application provides solutions for securely inserting and securing new stone panels into the existing arrangement, while ensuring proper alignment and flushness with neighboring panels. The application also addresses the need for retaining anchors and
25 brackets to effectively connect the new panels to the structure wall element.

Embodiments of the invention are associated with various advantages and/or technical effects.

30 There is disclosed a method for replacing an existing stone panel in a stone panel wall arrangement on a structure wall element, the method comprising the following steps:

- providing a retaining anchor in the structure wall element, the retaining anchor being located in a first area of a gap in the stone panel wall arrangement,
 - inserting a new stone panel into the gap, wherein the new stone panel is provided with a first groove at the top of the new stone panel and second groove at the bottom
- 5 of the new stone panel,
- securing the new stone panel to the structure wall element,
- wherein the step of securing the new stone panel to the structure wall element comprises the following steps:
- inserting a first bracket into the first groove, and
- 10 - connecting the first bracket with the retaining anchor, by
- providing a connector element in the retaining anchor.

The provision of a retaining anchor in the structure wall element enhances the stability of the new stone panel, ensuring that it remains securely in place once installed. The

15 use of grooves in the new stone panel for inserting brackets allows for a streamlined installation process, reducing the time and labor required for mounting the panel. The connector element in the retaining anchor offers a reliable means of attachment, which can be easily engaged and disengaged, facilitating maintenance and potential future panel replacements.

20 The method provides the advantage of easily replacing an existing stone panel in a stone panel wall arrangement on a structure wall element. The method allows for secure attachment of the new stone panel to the structure wall element using retaining anchors and brackets. The method enables adjustment of the position of the new stone

25 panel to ensure it is flush with neighboring existing stone panels.

The method includes the use of a safety wire to enhance the stability and safety of the stone panel wall arrangement. The method provides a simple and efficient process for replacing stone panels, reducing time and cost compared to traditional methods.

In a development, the method further provides the second groove being positioned on a second bracket that is provided at the structure wall element, the second bracket being located in a second area of the gap, wherein the step of securing the new stone panel to the structure wall element comprises the following steps:

- inserting a second bracket into the second groove, and connecting the second bracket with a retaining anchor, providing a connector element in the retaining anchor.

The addition of a second groove and bracket increases the contact points between the stone panel and the structure wall element, distributing the load more evenly and improving the overall structural integrity of the wall. The second bracket also provides redundancy in the mounting system, which serves as a safety feature in case one of the brackets fails or becomes loose over time. By utilizing two brackets, the new stone panel can be aligned more precisely within the gap, ensuring a consistent and aesthetically pleasing appearance of the stone panel wall arrangement.

In a further embodiment, a total of at least four retaining anchors is provided in the structure wall element, two of the retaining anchors being located in a first area of a gap in the stone panel wall arrangement, at a horizontal distance from each other, and two of the retaining anchors are located in a second area of the gap, at a horizontal distance from each other. This is followed by providing a connector element in each retaining anchor, followed by providing an adjustment element on each one of the connector elements, and followed by inserting a new stone panel into the gap. It follows the inserting two first brackets into the first groove of the new stone panel, at a horizontal distance from each other, and inserting two second brackets into the second groove of the new stone panel, at a horizontal distance from each other.

The use of at least four retaining anchors, with two in each area of the gap, allows for a balanced distribution of forces exerted on the stone panel, reducing the risk of stress concentration and potential damage. The horizontal spacing of the retaining anchors

provides additional support for the stone panel, especially in larger panels where a single anchor point may be insufficient to maintain stability. Multiple anchors also facilitate the alignment and leveling of the stone panel during installation, ensuring that the panel is properly positioned within the wall arrangement.

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In a further method for replacing an existing stone panel in a stone panel wall arrangement on a structure wall element the new stone panel is provided with a second groove at the bottom of the new stone panel, with a first groove at the top of the new stone panel, wherein a safety wire is provided in the second groove, the method further comprising the step of connecting the safety wire with the structure wall element.

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The connection of a safety wire to the structure wall element acts as a fail-safe mechanism, preventing the stone panel from falling in the event of anchor or bracket failure, thereby enhancing safety for passersby and property. The safety wire provides an additional layer of security during the installation process, protecting workers from accidents associated with panel slippage or detachment. The integration of a safety wire into the mounting system allows for easy inspection and replacement, as it can be visually checked for integrity and tension without the need for disassembling the panel or the anchors.

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The safety wire can be connected with the structure wall element, and especially with a second bracket of another existing stone panel of the stone panel wall arrangement. Connecting the safety wire to a second bracket of another existing stone panel creates an interlocking system that distributes the load across multiple panels, reducing the likelihood of individual panel failure. This interconnection of panels via the safety wire can help maintain the structural integrity of the entire wall arrangement, as the load is shared and not solely borne by the new panel's anchors and brackets. The use of existing stone panel brackets for safety wire attachment minimizes the need for additional drilling or modifications to the structure wall element, preserving the original wall's integrity and appearance.

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The new stone panel comprises a first side groove at a first side of the new stone panel and a second side groove at a second side of the new stone panel, the safety wire being provided in the first side groove and/or in the second side groove.

- 5 The incorporation of first and second side grooves in the new stone panel for housing the safety wire enhances the structural integrity of the wall arrangement by providing additional anchoring points especially for the safety wire, which can prevent the stone panel from dislodging and improve overall safety. The use of side grooves for the safety wire allows for a more streamlined and aesthetically pleasing design, as the safety
- 10 features are integrated within the panel itself rather than being externally attached, leading to a cleaner finish on the wall surface. The flexibility to place the safety wire in either the first side groove or the second side groove, or both, provides adaptability in the installation process, accommodating various wall configurations and ensuring that the safety wire can be optimally positioned for maximum effectiveness.

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According to one option, the following steps can be provided:

- providing an adjustment element on the connector element,
- followed by inserting a protruding end of the connector element into a mounting hole of the first bracket and into a mounting hole of the second bracket,
- 20 - this can be followed by providing a holding element on the protruding end of the connector element,
- this can be followed by tightening the holding element or the holding elements against the the adjustment element or the adjustment elements, by using a racking key tool that is inserted into a gap between the new stone panel and a neighboring existing stone
- 25 panel.

- The provision of an adjustment element on the connector element allows for precise alignment of the new stone panel with the existing panels, ensuring a uniform appearance and structural consistency across the stone panel wall arrangement. The
- 30 use of a racking key tool to tighten the holding and adjustment elements through a gap between panels offers a non-invasive and efficient means of securing the new panel in

place without damaging the surrounding structure or panels. The method's ability to achieve a flush outer surface between the new and existing stone panels not only enhances the visual continuity of the wall but also prevents uneven surfaces that could collect debris or water, potentially leading to maintenance issues.

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When the the adjustment element on the connector element are arranged such that the outer surface of the new stone panel is flush with the outer surface of a neighboring existing stone panel, then the outer surfaces of the new and existing stone panels ensures a seamless integration of the replacement panel, preserving the aesthetic integrity of the wall. This method facilitates the restoration of the wall's original design features and patterns, which is particularly beneficial for heritage or architecturally significant structures. Achieving a flush outer surface alignment reduces the risk of creating ledges or protrusions that could pose safety hazards or contribute to the accumulation of dirt and moisture, thereby maintaining the wall's durability and cleanliness.

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Another optional method for replacing an existing stone panel in a stone panel wall arrangement on a structure wall element comprises the following steps:

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- providing a first lower bracket element at the structure wall element, in the second area of the gap,
- providing a second lower bracket element at the first lower bracket element,
- adjusting the second lower bracket element with respect to the first lower bracket element,
- securing the position of the second lower bracket element with respect to the first lower bracket element.

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The provision of a first and second lower bracket element allows for a robust and stable support system for the new stone panel, which can effectively distribute the panel's weight and reduce stress on the structure wall element. The adjustability of the second lower bracket element relative to the first provides a customizable support mechanism that can be tailored to the specific dimensions and requirements of the new stone panel,

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ensuring a secure fit. The ability to secure the position of the second lower bracket element relative to the first ensures that once the optimal alignment is achieved, it will be maintained over time, preventing any shifting or settling that could compromise the wall's integrity.

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In a development, the method further comprises a step of adjusting the second lower bracket element with respect to the first lower bracket element being done such that the outer surface of the new stone panel is flush with the outer surface of a neighboring existing stone panel. The adjustment of the second lower bracket element to align the new stone panel's outer surface with that of the neighboring panels allows for a consistent and even load distribution across the wall, which can enhance the structural stability of the entire arrangement. By ensuring that the outer surfaces are flush, the method minimizes the risk of water ingress and the potential for freeze-thaw cycles to cause damage, thereby extending the lifespan of the wall. The precise alignment facilitated by this method contributes to a visually appealing and uniform facade, which is important for both aesthetic value and the preservation of property value, especially in commercial or residential buildings where appearance is a key consideration.

In a development, the method further comprises the following steps:

- 20 - providing a retaining anchor in the structure wall element, the retaining anchor being located in a first area of a gap in the stone panel wall arrangement,
- inserting a new stone panel into a gap in the stone panel wall arrangement, wherein the new stone panel is provided with a second groove at the bottom of the new stone panel, with a first groove at the top of the new stone panel, and with a first side groove at a first side of the new stone panel, and with a second side groove at a second side of the new stone panel,
- 25 - the second groove being positioned on a second bracket that is provided at the structure wall element, the second bracket being located in a second area of the gap,
- inserting an first bracket into the first groove, and
- 30 - connecting the first bracket with the retaining anchor,

wherein the step of connecting the first bracket with the retaining anchor and/or the step of connecting the second bracket with the retaining anchor comprises the following steps:

- screwing a bolt into the retaining anchor,
- 5 - putting a piece-A element on the bolt and secure it with a element against the structure wall element,
- mounting a piece-B element to the piece-A element, using a second bolt -element element,
- fixing the piece-A element with respect to the structure wall element,
- 10 -fixing the piece-B element with respect to the piece-A element.

The provision of a retaining anchor in the structure wall element enhances the stability of the stone panel wall arrangement by securely anchoring the new stone panel in place, thereby reducing the risk of displacement or damage due to external forces. The method of inserting a new stone panel with grooves on all sides and connecting it to the retaining anchor via brackets ensures a precise and firm fit within the gap, contributing to the overall structural integrity and aesthetic continuity of the wall. The use of bolts to connect the brackets to the retaining anchor allows for a strong and adjustable connection, which can be easily assembled or disassembled for maintenance or replacement of the stone panels.

In a development, the method further comprises the step of adjusting the piece-A element with respect to the structure wall element and the piece-B element with respect to the piece-A element such that the outer surface of the next existing stone wall panel is flush with the outer surface of the new stone wall panel. The step of adjusting the piece-A and piece-B elements ensures that the outer surface of the new stone panel aligns with the existing panels, resulting in a seamless and visually appealing finish. The ability to adjust the position of the piece-A and piece-B elements allows for compensation of any irregularities in the structure wall element or the stone panels, ensuring a uniform appearance across the wall. The adjustment feature provides flexibility during installation, accommodating for variations in stone panel thickness or

wall surface irregularities, which can reduce the need for custom fabrication of stone panels.

In a development, the method further comprises a step of providing a retaining anchor for the first bracket and/or the first bracket comprising the steps of

- 5 - providing a first retaining element in the retaining anchor,
- providing a coupler element at the first retaining element, wherein the coupler element can be at least partially provided in the structure wall element during the installation of the new stone panel,
- providing a second retaining element in the coupler element.

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The use of a first retaining element within the retaining anchor and a coupler element provides a multi-component anchoring system that enhances the versatility and adaptability of the anchor to different stone panel configurations and wall conditions.

- 15 The incorporation of a second retaining element within the coupler element allows for additional adjustability and fine-tuning of the stone panel positioning, ensuring a precise fit within the wall arrangement. The multi-component anchoring system facilitates the distribution of load across multiple points, which can improve the overall load-bearing capacity of the stone panel wall arrangement and enhance its durability.

- 20 In a development, the method further comprises a step of inserting a new stone panel into a gap in the stone panel wall arrangement comprising a step of turning the second retaining element such that a retaining pin of the second retaining element engages in a first groove and/or in a second groove of the new stone panel.

- 25 The step of turning the second retaining element to engage a retaining pin in the grooves of the new stone panel provides a secure locking mechanism that prevents the panel from shifting, thereby enhancing the safety and stability of the wall. The engagement of the retaining pin in the grooves allows for a quick and efficient installation process, as it reduces the need for additional fastening hardware or
30 adhesives. The ability to engage the retaining pin in either the first or second groove of

the new stone panel offers flexibility in the positioning of the panel, accommodating for variations in the gap size or alignment with adjacent panels.

- In a development, the method further comprises steps of providing a coupler element at the first retaining element and providing a second retaining element in the coupler element comprising a step of adjusting the position of the second retaining element in the coupler element such that an outer surface of the new stone panel is flush with the outer surface of a neighboring existing stone panel.
- 10 The step of adjusting the position of the second retaining element within the coupler element ensures that the new stone panel can be precisely aligned with neighboring panels, which is critical for maintaining a consistent and professional appearance of the wall. The adjustability of the second retaining element allows for on-site customization to the unique dimensions and conditions of the installation space, reducing the need for
- 15 pre-measurement and pre-fabrication. The method provides a systematic approach to achieving flush alignment between panels, which not only enhances the visual appeal but also ensures that there are no protruding edges that could pose a safety hazard or collect debris.
- 20 In a development, the method further comprises a step of connecting the first bracket with the retaining anchor comprising the following steps:
- Providing a hole into the structure wall element,
 - inserting the retaining anchor into the hole,
 - screwing a retaining screw assembly into the retaining anchor,
 - 25 -cutting the retaining screw assembly in order to create a first retaining element and a second retaining element with a retaining pin,
 - screwing a coupler sleeve on the threaded end of the first retaining element such that the coupler sleeve is flush with the first retaining element or similar,
 - holding a threaded end of the second retaining element near the coupler sleeve and
 - 30 the threaded end of the first retaining element,

-unscrewing the coupler sleeve from the threaded end of the first retaining element and onto the threaded end of the second retaining element such that the coupler sleeve connects the first retaining element with the second retaining element.

- 5 The provision of a hole and insertion of a retaining anchor ensures a secure and stable connection between the structure wall element and the bracket, which is critical for the long-term durability and safety of the installation. The step of cutting the retaining screw assembly to create two retaining elements with a retaining pin allows for a customizable length of the retaining elements, accommodating various thicknesses of structure wall
- 10 elements and ensuring a versatile application of the method. The use of a coupler sleeve to connect the first and second retaining elements provides a strong and reliable joint that can withstand significant loads, reducing the risk of failure in the bracket-anchor assembly.
- 15 In a development, the method further comprises a step of connecting the second bracket with the retaining anchor comprising the following steps:
- providing a hole into the structure wall element,
 - inserting the retaining anchor into the hole,
 - screwing a first retaining element into the retaining anchor,
- 20 - screwing an adjustment element on the threaded end of the first retaining element of the adjustment element such that the outer surface of the adjustment element is flush with the inner surface of the next existing stone wall panel,
- putting the new stone panel with the second bracket onto the threaded end of the first retaining element, such that it contacts the outer surface of the adjustment element
- 25 - screwing a holding element onto the threaded end of the first retaining element, such that the second bracket is held between the adjustment element and the holding element.

The inclusion of an adjustment element allows for precise alignment of the new stone

30 panel with the existing stone wall, ensuring a seamless and aesthetically pleasing finish. The method of securing the second bracket between the adjustment element and the

holding element provides a robust clamping mechanism that can accommodate natural variations in stone panel thickness and maintain the panel in the desired position. The ability to screw the holding element onto the first retaining element offers a straightforward and efficient means of fastening the bracket, which can be easily
5 adjusted or removed if necessary for maintenance or replacement of the stone panel.

In a development, the method further comprises a holding element being provided with an Allen key hole, so that the holding element can be turned in the gap between the new stone panel and the existing stone panel.

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The provision of an Allen key hole in the holding element allows for easy and secure tightening or loosening of the holding element, facilitating installation and adjustments with common tools. The Allen key hole also provides an anti-vandal feature, as it requires a specific tool for adjustment, thereby reducing the likelihood of unauthorized
15 tampering with the stone panel installation. The design of the holding element with an Allen key hole enhances the overall aesthetics of the installation by concealing the fastening mechanism, contributing to a cleaner and more polished appearance.

In a development, the method further comprises a second bracket being used as a first
20 bracket. The versatility of using the second bracket as a first bracket simplifies the inventory of components required for installation, reducing costs and streamlining the construction process. This interchangeability of brackets also allows for a more flexible installation approach, as the same bracket can be adapted to different positions and functions within the stone panel wall arrangement. The ability to use the second bracket
25 as a first bracket can lead to reduced manufacturing complexity and time, as only one type of bracket needs to be produced and stocked.

In a development, the method further comprises the following steps:

- providing a retaining anchor in the structure wall element, the retaining anchor being
30 located in a first area of a gap in the stone panel wall arrangement,

- inserting a new stone panel into a gap in the stone panel wall arrangement, wherein the new stone panel is provided with a second groove at the bottom of the new stone panel, and with a first groove at the top of the new stone panel , and with a first side groove at a first side of the new stone panel, and with a second side groove at a second side of the new stone panel,
- the second groove being positioned on a second bracket that is provided at the structure wall element, the second bracket being located in a second area of the gap,
- inserting an first bracket into the first groove, and
- connecting the first bracket with the retaining anchor.

The method of locating the retaining anchor in a first area of a gap and positioning the new stone panel with corresponding grooves ensures a precise and secure fit within the stone panel wall arrangement, enhancing structural integrity. The step of inserting the first bracket into the first groove of the new stone panel provides a discrete and effective means of anchoring the panel, which is particularly beneficial for maintaining the aesthetic continuity of the wall. The connection of the first bracket with the retaining anchor after the panel is in place allows for a post-installation adjustment capability, ensuring that the panel can be aligned and secured even after it is positioned within the gap.

Bracket fastener assembly with a connector element, with an adjustment element, with a first bracket or with a second bracket for a stone panel, and with a holding element that comprises a roughened cylindrical surface for a form-locking actuation, actuation by a key racket tool.

The bracket fastener assembly with a connector element provides a secure and adjustable connection between the stone panel and the structure wall element, allowing for precise alignment and positioning of the stone panels during installation. The inclusion of an adjustment element enables fine-tuning of the stone panel's position after installation, ensuring a good fit and finish, and accommodating for any irregularities in the wall surface or the stone panels themselves. The first and second brackets offer

versatility in mounting options, catering to different stone panel designs and structural requirements, thus enhancing the adaptability of the fastener assembly to various construction scenarios.

- 5 In a development, the assembly further comprises a roughened cylindrical surface having a tooth height of larger than 0.1mm and smaller than 1mm or smaller than 0.3mm.

10 The holding element with a roughened cylindrical surface provides increased friction and a form-locking actuation, which ensures a more reliable and stable grip on the stone panel, reducing the risk of slippage or movement over time. The roughened texture of the cylindrical surface allows for a more secure engagement with the adjustment tools, facilitating easier and more precise adjustments during installation and maintenance. The form-locking actuation mechanism provided by the roughened
15 surface ensures that adjustments remain fixed once set, contributing to the long-term durability and integrity of the stone panel installation.

Stone panel wall arrangement on a structure wall element with a plurality of stone panels, wherein a bracket fastener assembly according to one of claims 21 to 23 is
20 provided for securing a new stone panel to the structure wall element.

The bracket fastener assembly's ability to secure new stone panels to the structure wall element with a plurality of stone panels ensures a cohesive and uniform appearance for renovations or repairs, maintaining the aesthetic integrity of the wall arrangement.

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The use of the bracket fastener assembly for attaching stone panels allows for a non-invasive installation process, preserving the structural integrity of the existing wall while providing a reliable mounting solution.

The assembly's design accommodates the secure attachment of stone panels in a variety of configurations, enabling creative and flexible design options for architects and builders when working with stone panel wall arrangements.

- 5 The application further provides a stone panel for replacing an existing stone panel in a stone panel wall arrangement on a structure wall element, with at least one groove that comprises an outer flange and an inner flange, at least a section of the outer flange on the outer side of the stone panel being longer than the inner flange on the inner side of the stone panel.

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The stone panel's groove design, featuring an outer flange longer than the inner flange, provides an improved anchoring system that enhances the stability and security of the panel when mounted to a structure wall element. The asymmetrical flange lengths facilitate easier installation and alignment of the stone panels, as the longer outer flange offers a more accessible grip point for handling and positioning the panels. The groove configuration allows for a streamlined appearance from the exterior, as the longer outer flange can be designed to align flush with the adjacent panels, minimizing visible seams and contributing to the aesthetic appeal of the wall.

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- 20 In a development, the panel further comprises a length of the inner flange being between 70% and 30% of the length of the outer flange. The specified proportion of the inner flange length relative to the outer flange allows for a balanced distribution of structural loads, which can enhance the overall stability and durability of the panel. By defining a range for the inner flange length, the design accommodates various architectural requirements and aesthetic preferences without compromising the structural integrity of the panel.

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- In a development, the panel further comprises a length of the inner flange being between 55% and 45% of the length of the outer flange. The narrower range for the inner flange length ensures a more precise control over the panel's mechanical properties, leading to predictable performance under load. This specific proportion

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between the inner and outer flange lengths can optimize the panel's weight distribution, potentially reducing material costs and facilitating easier installation.

5 In a development, the arrangement further comprises at least one new stone panel being provided with a second groove at the bottom of the new stone panel, with a first groove at the top of the new stone panel, with the second groove being positioned on a second bracket that is provided at the structure wall element such that the second bracket being located in a second area of the gap and with an first bracket being positioned in the first groove with the first bracket being connected with the retaining anchor, wherein a safety wire is provided in the second groove, wherein the safety wire is connected with the structure wall element. The structural element can be a carrier wall, a structure wall, a façade stone, or a pillar, or similar.

15 The incorporation of a second groove at the bottom of the new stone panel allows for a secure and stable attachment to the second bracket, enhancing the safety and longevity of the installation. The use of a safety wire connected to the structure wall element provides an additional fail-safe mechanism, ensuring that the panel remains in place even in the event of bracket failure or other structural compromises.

20 In a development, the arrangement further comprises at least one new stone panel being provided with a first side groove at a first side of the new stone panel, and with a second side groove at a second side of the new stone panel, wherein the safety wire is provided in the first side groove and in the second side groove.

25 Providing grooves on both sides of the new stone panel for the safety wire ensures that the panel is secured from lateral movements, which can be critical in high-wind or seismic conditions. The dual side groove configuration with the safety wire enhances the redundancy of the safety system, offering increased protection against panel dislodgement or failure.

In a development, the arrangement further comprises a safety wire being connected with a second bracket of an existing stone panel. Connecting the safety wire to the second bracket of an existing stone panel allows for an integrated safety system that ties the new and existing panels together, distributing loads and providing mutual stabilization. This connection method can simplify the installation process by utilizing the existing structure for support, potentially reducing the need for additional anchoring hardware and labor.

In a further development, the arrangement further comprises a safety wire forming a closed loop of a piece of wire with two open ends of the piece of wire being connected with each other. The inclusion of a safety wire forming a closed loop enhances the structural integrity of the stone panel, providing additional support and reducing the risk of breakage during handling or installation. The closed loop configuration of the safety wire ensures that even if one part of the wire were to fail, the continuity of the loop would maintain some level of safety feature, offering redundancy in the safety mechanism. Connecting the open ends of the wire to form a closed loop simplifies the installation process, as it eliminates the need for additional fastening elements or complex wire management.

In a development, the arrangement further comprises a safety wire being provided within openings in the new stone panel that connect the second groove with the first side groove and/or the second side groove and/or within openings in the new stone panel that connect the first groove with the first side groove and/or the second side groove. The openings can come in the form of holes or slits in the new stone panel that connect the second groove with the first side groove and/or the second side groove and/or within holes or slits in the new stone panel that connect the first groove with the first side groove and/or the second side groove.

The provision of safety wire within openings that connect various grooves on the stone panel allows for a seamless integration of the safety feature without altering the aesthetic appearance of the panel. By threading the safety wire through the internal

openings of the stone panel, the risk of external damage or tampering with the safety system is minimized, enhancing the overall durability of the safety feature. The strategic placement of the safety wire within the stone panel's openings ensures that the wire does not interfere with the panel's fit or alignment when installed alongside other panels, maintaining a uniform facade.

In a development, the panel further comprises a channel for a placing a safety wire being provided by the second groove. The channel provided by the second groove for placing a safety wire allows for a dedicated space for the wire, which can prevent interference with the stone panel's structural or decorative elements. The integration of a channel within the second groove for the safety wire ensures that the wire is adequately protected from environmental factors, potentially increasing the longevity of the safety system. This configuration allows for easier access and maintenance of the safety wire, as it is located within a specific channel, simplifying inspection and replacement procedures if necessary.

In a development, the panel further comprises a first side groove at a first side of the stone panel, and with a second side groove at a second side of the stone panel, wherein the channel for a placing a safety wire is provided by the second groove, by the first side groove, and by the second side groove, and by openings that connect the second groove with the first side groove and the second side groove and/or by openings that connect the first groove with the first side groove and the second side groove.

The incorporation of first and second side grooves, in addition to the second groove, provides a comprehensive network of channels for the safety wire, ensuring that the wire is distributed evenly across the panel for optimal support. The use of openings to connect the grooves allows for a versatile routing of the safety wire, accommodating various panel sizes and configurations while maintaining the structural benefits of the safety system. The interconnected groove system for the safety wire enhances the panel's ability to withstand lateral forces, offering improved stability and resistance to shearing or shifting when the panel is mounted.

FURTHER ADVANTAGES

5 The application provides a method for securing new stone panels to a structure wall element by inserting upper and lower brackets into grooves on the new stone panel, and connecting the brackets with retaining anchors. The method involves providing bolts, adjustment nuts, mounting holes, and holding nuts to secure the brackets to structure wall elements. Additionally, a racking key plate may be used used to tighten a holding nut against a adjustment nut by inserting it into the gap between a new stone
10 panel and a neighboring existing stone panel.

Embodiments of the invention are associated with various advantages and/or technical effects.

15 There is disclosed a method for replacing an existing stone panel in a stone panel wall arrangement on a structure wall element, the method comprising the following steps:
- providing a retaining anchor in the structure wall element, the retaining anchor being located in a first area of a gap in the stone panel wall arrangement, - inserting a new stone panel into the gap, wherein the new stone panel is provided with a bottom groove
20 at the bottom of the new stone panel and with a top groove at the top of the new stone panel,
- securing the new stone panel to the structure wall element.

25 The step of securing the new stone panel to the structure wall element comprises the following steps:
- inserting an upper bracket into the top groove, and connecting the upper bracket with the retaining anchor, by providing a bolt in the retaining anchor, followed by providing a adjustment nut on the bolt, followed by inserting a protruding end of the bolt into a mounting hole of the upper bracket, followed by providing a holding nut on the
30 protruding end of the bolt, followed by tightening the holding nut against the adjustment

nut, by using a racking key plate that is inserted into a gap between the new stone panel and a neighboring existing stone panel.

The method provides the advantage of improved attachability, allowing for secure and reliable fastening of the new stone panel to the structure wall element, even if there is a very small slit left between each stone panel of the stone panel wall arrangement. In such cases, the application provides a method of tightening the new stone panel to the structure wall element through the small slit between two neighbouring stone panels. This is facilitated by the design of a bracket fastener assembly of the application.

A further advantage ensures that the new stone panel is firmly secured in place by utilizing multiple retaining anchors and brackets, allowing for the replacement of existing stone panels with new ones without compromising the overall integrity of the structure.

The application provides an improved stone panel wall arrangement, ensuring that the new stone panel is tightly secured and does not pose any safety risks or hazards. Using the optional racking key plate for tightening the holding nuts against the adjustment nuts, resulting in a stable and durable installation, even when no other tool can be inserted through the slit between two neighboring stone panels..

The method comprises a bottom groove being positioned on a lower bracket that is provided at the structure wall element, the lower bracket being located in a second area of the gap, wherein the step of securing the new stone panel to the structure wall element comprises the following steps:

- inserting a lower bracket into the bottom groove, and connecting the lower bracket with a retaining anchor, by
- providing a bolt in the retaining anchor, followed by providing an adjustment nut on the bolt, followed by inserting a protruding end of the bolt into a mounting hole of the lower bracket, followed by providing a holding nut on the protruding end of the bolt, followed by tightening the holding nut against the adjustment nut, optionally but not necessarily,

by using a racking key plate that is inserted into a gap between the new stone panel and a neighboring existing stone panel.

5 In a development, the method further comprises a total of four retaining anchors being provided in the structure wall element, two of the the retaining anchors being located in a first area of a gap in the stone panel wall arrangement, at a horizontal distance from each other, and two of the the retaining anchors being located in a second area of the gap, at a horizontal distance from each other. Each one of the retaining anchors is provided with a bolt, followed by providing an adjustment nut on each one the bolts,
10 followed by

- inserting a new stone panel into the gap, comprising the following steps:
- inserting two upper brackets into the top groove of the new stone panel, at a horizontal distance from each other, and inserting two lower brackets into the bottom groove of the new stone panel, at a horizontal distance from each other,

15 inserting each protruding end of the bolts in the first area into a mounting hole of an upper bracket, and inserting each protruding end of the bolts in the second area into a mounting hole of a lower bracket.

A holding nut is losely provided on the protruding end of each bolt, as close as possible
20 to each bracket. The new stone panel is then pushed into the gap until each bracket reaches the respective adjustment nut. At this point, if the outer surface of the new stone panel is not flush with the surfaces of the neighboring existing stone panels, the adjustment nuts can be tuned in or out until the outer surface of the new stone panel is not flush with the surfaces of the neighboring existing stone panels. By providing the
25 bracket fastener assembly for all four brackets, the new stone panel can be pushed into the gap, while the front side is kept fully horizontally, without tilting. That allows for providing small slits between neighboring stone panels, the new stone panel slips into the gap, similar to a drawer in a cabinet furniture. In this development, the method provides a step of arranging the adjustment nut on the bolt such that the outer surface
30 of the new stone panel is flush with the outer surface of a neighboring existing stone panel.

By tightening each holding nuts against the corresponding adjustment nut, a stable and firm connection between the new stone panel and the structure wall element can be achieved. This may be achieved by using a racking key plate that is inserted into a gap
5 between the new stone panel and a neighboring existing stone panel, but any other tool for turning the adjustment nuts.

The method allows for easy replacement of an existing stone panel in a stone panel wall arrangement on a structure wall element. This eliminates the need for costly and time-
10 consuming demolition and reconstruction of the entire wall.

The use of retaining anchors and brackets provides a secure and stable attachment of the new stone panel to the structure wall element. This ensures that the panel will not become loose or dislodged over time, increasing the longevity and durability of the wall
15 arrangement.

The inclusion of adjustment nuts allows for precise alignment and leveling of the new stone panel with the neighboring existing stone panel. This ensures a seamless and aesthetically pleasing appearance of the wall arrangement.
20

The bottom groove sitting on the lower bracket provides additional stability and support to the new stone panel. This prevents any sagging or movement of the panel, enhancing the overall structural integrity of the wall arrangement.

25 The use of retaining anchors and movable brackets for both the top and bottom grooves of the new stone panel ensures a balanced and secure attachment to the structure wall element. This distributes the load evenly across the panel, reducing the risk of any localized stress or damage.

30 The method of the application allows for easy adjustment and tightening of the holding nuts against the adjustment nuts using a racking key plate. This simplifies the

installation process and ensures a tight and secure connection between the new stone panel and the retaining anchors, minimizing the risk of any loosening or detachment.

5 The provision of four retaining anchors in the structure wall element, two in each area of the gap, increases the overall stability and load-bearing capacity of the wall arrangement. This allows for the installation of larger and heavier stone panels without compromising the structural integrity. The use of multiple upper and lower brackets, each connected to a retaining anchor, provides a secure and balanced movable attachment of the new stone panel. This ensures that the panel is evenly supported and
10 prevents any tilting or misalignment.

The method allows for simultaneous installation of multiple new stone panels, reducing the overall installation time and labor required. This increases efficiency and productivity, making the method suitable for large-scale projects.

15 The arrangement of the adjustment nut on the bolt ensures that the outer surface of the new stone panel is flush with the neighboring existing stone panel. This creates a seamless and visually appealing transition between the panels, enhancing the overall aesthetic quality of the wall arrangement.

20 The use of a racking key plate to tighten the holding nuts against the adjustment nuts allows for precise control and adjustment of the panel's position. This ensures that the new stone panel is aligned and leveled with the neighboring existing stone panel, maintaining a uniform and cohesive appearance.

25 The method also allows for easy removal and replacement of the new stone panel if necessary. This provides flexibility and adaptability to the wall arrangement, allowing for future modifications or repairs without significant disruption or cost.

30 In a development, the method further comprises the step of connecting a safety wire of the stone panel with the structure wall element. The method allows for a secure

connection between the safety wire and the structure wall element, ensuring the stability and safety of the stone panel wall arrangement, even if the bracket fastener assembly should become loosened. This provides an additional layer of support and reinforcement to the stone panel wall arrangement, reducing the risk of detachment or collapse. The method facilitates easy installation and removal of the stone panels, despite having the safety wire, allowing for flexibility in design and maintenance of the structure wall element.

In a development of the bracket fastener assembly, the roughened cylindrical surface with a tooth height of larger than 0.1mm and smaller than 1mm provides enhanced grip and friction between the holding nut and tool for turning the holding nut, ensuring a secure and stable attachment of the holding nut against the corresponding adjustment nut. The roughened cylindrical surface increases the locking between the holding nut and the tool, allowing to transmit higher forces and pressures without failure. The roughened cylindrical surface improves the overall durability and longevity of the holding nut, reducing the need for replacements if the holding nut is loosened and tightened more than once.

In a development, the assembly further comprises a roughened cylindrical surface having a tooth height of larger than 0.1mm and smaller than 1mm. The roughened cylindrical surface with a tooth height of larger than 0.1mm and smaller than 0.3mm provides an improved grip, ensuring a secure and stable attachment without excessive roughness. The specific tooth height range of the roughened cylindrical surface strikes a balance between grip and ease of installation, making it easier to attach and detach the stone panels when necessary. In a further development, the assembly further comprises a roughened cylindrical surface having a tooth height of larger than 0.1mm and smaller than 0.3mm. The bracket fastener assembly provides a reliable and efficient means of securing the new stone panel to the structure wall element, ensuring a strong and durable connection. The bracket fastener assembly allows for easy and quick installation of the new stone panel, reducing the time and effort required for construction or renovation projects. The bracket fastener assembly offers versatility in

design and compatibility, accommodating different sizes and types of stone panels for a wide range of applications.

5 Stone panel wall arrangement on a structure wall element with a plurality of stone panels, and with the bracket fastener assembly of the application ensures the stability and structural integrity of the new stone panel, minimizing the risk of displacement or damage. The bracket fastener assembly provides an effective solution for securing stone panels to structure wall elements, eliminating the need for complex or costly attachment methods. The stone panel wall arrangement with the bracket fastener
10 assembly further offers improved resistance to external forces, such as wind or seismic activity, enhancing the overall safety and durability of the structure.

In a development of the application, the panel further comprises at least a section of the groove or the entire groove where the bracket fastener assembly is provided with length
15 of the inner flange being between 70% and 30% of the length of the outer flange. This advantage allows for a more secure and stable connection between the panel and the outer flange, reducing the risk of detachment or failure. That means that the bolt can be arranged below or above the slit between two neighbouring stone panels so that the bolt is fully covered by the new stone panel while a circular segment of the holding nut is
20 protruding into the slit. The segment is just large enough in size so that the accessible segment of the holding nut can then be turned by tool that is inserted into the slit.

In a development, the panel further comprises a length of the inner flange being between 70% and 30% of the length of the outer flange, at least at a portion of the inner
25 flange that is large enough to take up the holding nut such that it can still rotate on the bolt. This provides flexibility in design and allows for customization based on specific requirements, enabling the panel to be adapted to different sizes and shapes of outer flanges. This also enhances the overall structural integrity of the panel, as the inner flange provides additional support and reinforcement to the connection with the outer
30 flange, increasing the load-bearing capacity of the panel. In a further development, the panel further comprises a length of the inner flange being between 55% and 45% of the

length of the outer flange. This advantage allows for a more precise and controlled fit between the panel and the outer flange, minimizing any gaps or misalignments that could compromise the performance of the assembly, especially of the bolt and the holding nut. This simplifies the installation process, as the reduced length of the inner
5 flange facilitates easier alignment and positioning of the panel onto the outer flange, saving time and effort during assembly. This improves the overall efficiency of the assembly, as the reduced length of only a section the inner flange minimizes material usage and waste, resulting in cost savings and a more sustainable manufacturing process. This enhances also the overall stability and rigidity of the panel, as the
10 remaining longer sections of the inner flange provides additional support and reinforcement to the stone panel, reducing the risk of deformation or distortion under load.

In the following, further embodiments of the application are described.

15

The method comprises the following steps:

- providing a retaining anchor in the structure wall element, the retaining anchor being located in a first area of a gap in the stone panel wall arrangement,
- inserting a new stone panel into a gap in the stone panel wall arrangement.

20

The method of the application is safe, as compared with the prior art. There is no danger that a replaced stone panel can fall out from the stone panel wall arrangement.

25

In a development, the step of connecting the safety wire with the structure wall element comprises connecting a safety wire with a bottom bracket of another existing stone
panel of the stone panel wall arrangement.

In a development, the step of connecting the safety wire with the structure wall element comprises forming a closed loop of a piece of wire by connecting two open ends of the piece of wire are connected with each other. is put into its final position.

30

At least one new stone panel is provided with a bottom groove at the bottom of the new stone panel, with a top groove at the top of the new stone panel, and with a first side groove at a first side of the new stone panel, and with a second side groove at a second side of the new stone panel, with the bottom groove being positioned on a lower bracket that is provided at the structure wall element such that the lower bracket being located in a second area of the gap and with an upper bracket being positioned in the top groove with the upper bracket being connected with the retaining anchor, wherein a safety wire is provided in the bottom groove, in the first side groove, and in the second side groove, wherein the safety wire is connected with the structure wall element.

In a development, the safety wire is connected with a lower bracket of an existing stone panel. That makes it easy to connect the safety wire with the structure wall element. In a development, the safety wire forms a closed loop of a piece of wire with two open ends of the piece of wire being connected with each other, which makes it easy to mount that safety wire.

In a further development, the safety wire is provided within holes in the new stone panel that connect the bottom groove with the first side groove and the second side groove. In a development, a channel for a placing a safety wire is provided by the bottom groove, by the first side groove, and by the second side groove, and by holes that connect the bottom groove with the first side groove and the second side groove and/or that connect the top groove with the first side groove and the second side groove. That channel makes with holes sure that the safety wire is always tightly connected with the new stone panel. This prevents detaching and falling of the new stone panel.

The application provides a method for replacing an existing stone panel in a stone panel wall arrangement on a structure wall element in the form of a carrier wall, a structure wall, a façade stone, a pillar, or similar.

Providing a retaining anchor, for example in the form of a wall anchor, in the structure wall element, wherein the retaining anchor being located in a first area, the upper area,

of a gap in the stone panel wall arrangement, has an advantage of creating a secure connection with the structure wall element.

- According to a further step, inserting a new stone panel into a gap in the stone panel wall arrangement, wherein the new stone panel is provided with a pre-cut bottom groove at the bottom of the new stone panel, with a pre-cut top groove at the top of the new stone panel, and with a first side groove at a first side of the new stone panel, and with a second side groove at a second side of the new stone panel, has an advantage of increasing the speed and ease of installation of the stone panel wall arrangement.
- 5 The pre-cut grooves on the new stone panel allow for a precise and secure fit with the adjacent panels, reducing the need for additional cutting and shaping during installation. This results in less time and effort required for the installation process, leading to increased efficiency and cost-effectiveness. Additionally, the precise fit of the new panel can enhance the overall appearance and structural integrity of the stone panel wall arrangement.
- 10 15

- The bottom groove being positioned on a Piece-A) lower bracket that is provided at the structure wall element, the lower bracket being located in a second area, a lower area, of the gap has an advantage of providing a secure and stable support for the structure wall element by allowing the bottom groove to securely engage with a corresponding top groove on the upper bracket that is positioned in a first area, the upper area, of the gap. This ensures proper alignment and prevents the structure wall element from shifting or dislodging, even under heavy loads or external forces. Additionally, the positioning of the lower bracket and bottom groove in the lower area of the gap enables easy access for installation and maintenance, without the need for complicated or time-consuming procedures.
- 20 25

- Inserting an upper bracket into the top groove has an advantage of providing additional stability and support to the structure.

Connecting the upper bracket with the retaining anchor has an advantage of providing increased stability and support to the object being secured.

- 5 A safety wire, e.g. a steel wire, is provided in the bottom groove, in the first side groove, and in the second side groove with an advantage of providing additional safety and security by ensuring that the components held in the grooves remain in place, even if there is sudden impact or vibration. The safety wire adds an extra layer of protection, preventing disengagement or accidental release of the components.
- 10 Connecting the safety wire with the structure wall element has an advantage of increased stability and rigidity of the overall structure, providing improved safety and durability.

- 15 In the case that a step of creating a gap by removing an existing stone panel from the structure wall element is provided, that makes sure that residues of earlier existing stone panels are properly removed before the step of filling that gap follows.

- 20 Barricading an area of work under the gap to ensure sufficient space has an advantage of improving safety by preventing unauthorized persons or equipment from entering the work area, reducing the risk of accidents or injuries.

- 25 Covering the area of work, the ground right below the stone panels, with protective panels, e.g. polyfoam and plywood, has an advantage of providing a cushioning effect that absorbs impact energy and reduces the risk of damage to the underlying surface, thereby increasing the longevity and durability of the stone panels. Additionally, the protective panels prevent moisture and debris from penetrating the subfloor, which helps maintain a clean and stable working environment.

- 30 Assigning a traffic marshall to control a ground traffic for safety purpose has an advantage of reducing the likelihood of accidents and improving the overall efficiency of ground traffic management.

Carefully approach the building maintenance unit “BMU” working platform for identifying the location of the damaged existing stone panel that needs to be replaced has an advantage of reducing time and costs associated with identifying and replacing damaged stone panels, improving overall efficiency and performance of building maintenance operations.

Providing a safety catch netting between by one side of a façade surface of the structure wall element, e.g. by suction cups, and by the other side a BMU platform, a cradle, right below the area of work has an advantage of reducing the risk of falling debris or tools from the work area, thereby increasing worker safety and preventing damage to property below.

Providing, installing and securing at least one suction cup to the existing stone panel has an advantage of allowing for quick and easy installation and removal of the panel without the need for drilling or damaging the underlying surface.

Removing, e.g. cutting away, existing sealant around the existing stone panel thoroughly, thereby exposing existing holding elements, e.g. brackets or pins, of the existing stone panel has an advantage of providing a clear view of the condition of the holding elements, allowing for easier maintenance and replacement of any damaged or weakened elements. Additionally, it ensures a secure and stable hold for the stone panel, improving overall building safety and longevity.

Installing a safety belt, a tie-in belt, around the existing stone panel has an advantage of increasing the overall stability and security of the stone panel, reducing the risk of dislodgement or collapse in the event of seismic activity or other external forces.

Connecting the safety belt with a structure wall element, e.g. tighten securely to the roof structure, has an advantage of increasing the stability and strength of the safety belt, ensuring better protection for the wearer in case of an impact or sudden stop.

Additionally, it reduces the likelihood of the safety belt becoming disconnected or slipping out of place, providing a more reliable and secure seatbelt system.

5 Connecting the safety belt with the BMU platform has an advantage of providing real-time monitoring and alerting of safety belt usage, ensuring compliance with safety regulations and reducing the risk of accidents in the workplace.

10 Using a cutting tool for removing the existing holding elements has an advantage of increased efficiency and precision in the removal process, resulting in reduced labor costs and improved product quality.

15 Moving the existing stone panel carefully to the BMU platform has an advantage of facilitating the replacement of damaged or worn out panels without the need for expensive and time-consuming scaffolding or building maintenance equipment.

20 Lowering the BMU platform to a ground has an advantage of making it easier and more efficient to load and unload heavy equipment or materials without the need for additional machinery or personnel. This can result in significant time and cost savings, as well as increased safety and reduced risk of damage to the equipment or materials being moved.

Disconnecting the safety belt from the BMU platform has an advantage of allowing the user to easily and quickly exit the platform in case of an emergency or danger.

25 Unloading the damaged existing stone panel from the BMU platform has an advantage of allowing for efficient and safe replacement of the panel, reducing the risk of injury to workers and minimizing downtime for the building's façade maintenance.

30 Loading the new stone panel to a BMU platform has an advantage of reducing the risk of worker injury and improving efficiency in building maintenance operations. The platform can be easily raised to the desired level, providing a stable and safe working

surface for workers to install the panel, without the need for manual lifting or scaffolding. Additionally, the use of the platform minimizes the time required to replace panels, resulting in faster turnaround times for building maintenance tasks.

- 5 Installing a safety belt around the new stone panel has an advantage of increasing the structural stability of the panel, thereby preventing any possible accidents or damages caused by its displacement or dislodgement.

- 10 Connecting the safety belt with the BMU platform has an advantage of increasing the safety and stability of workers while performing maintenance tasks at heights.

Bringing the BMU platform up to the gap, the location for replacement, has an advantage of reducing the risk of injury to maintenance personnel by eliminating the need for them to access the gap area.

- 15 Disconnecting the safety belt from the BMU platform has an advantage of eliminating the risk of the worker being suspended in the air while trying to unfasten the belt, thus increasing the overall safety and efficiency of the work process.

- 20 Connecting the safety belt with a structure wall element, e.g. tighten securely to the roof structure of the building, has an advantage of providing increased stability and strength in case of sudden movements or impacts.

- 25 Installing a first lower bracket element, a Piece-B bracket, at the structure wall element, in the second area of the gap has an advantage of increasing the stability and load-bearing capacity of the structure wall element by creating a secure connection point for the second upper bracket element, the Piece-A bracket, to be attached.

- 30 Installing a second lower bracket element, a Piece-A bracket, at the first lower bracket element to link with a piece-B bracket has an advantage of increasing the stability and

weight-bearing capacity of the entire bracket system, allowing for larger and heavier objects to be securely mounted.

5 Adjusting the second lower bracket element with respect to the first lower bracket element, making any necessary adjustment by moving through the bracket slots, has an advantage of providing precise alignment and stability in supporting a load-bearing structure.

10 Securing the position of the second lower bracket element with respect to the first lower bracket element, once the position of the bracket is finalized, by spot-weld the two brackets together has an advantage of providing a sturdy and durable connection between the first and second lower bracket elements, which enhances the overall stability of the structure and ensures that the components remain in place during use. This feature also helps to prevent any unwanted movement or shifting of the brackets, 15 which can improve the safety and performance of the device. Additionally, the use of spot-welding provides a cost-effective and efficient means of securing the brackets, reducing production time and minimizing the need for additional hardware or assembly steps.

20 The application provides a method comprising the step of fixing in place a rubber element, a rubber pad, to the lower bracket, e.g. the bottom piece-A bracket, to achieve a cushion connection.

25 The application provides a method comprising the step of fixing in place a rubber element, a rubber pad, to the lower bracket, a bottom piece-A bracket, to achieve a cushion connection.

By providing a rubber element to the lower bracket, the application improves shock absorption and creates a cushion connection between components, reducing the likelihood of damage or wear to the construction.

The use of a rubber pad in the lower bracket also reduces the transmission of vibration and noise through the system, enhancing overall performance and user comfort.

- 5 The application provides a method comprising the step of providing a retaining anchor for the upper bracket. The retaining anchor for the upper bracket provides enhanced stability and strength to the overall structure.

- 10 Providing a first retaining element in the retaining anchor, a drill hole on reinforced concrete structure wall/column, and insert drop in anchor to receive the “Part A” of a new retaining element has an advantage of enhancing the stability and longevity of the retaining element, as it securely anchors it to the concrete structure and prevents it from slipping, loosening or breaking away over time. This ensures the safety and reliability of the structure, especially in high-stress situations or harsh environmental conditions. Additionally, the use of a single retaining anchor with multiple retaining elements
15 reduces the overall cost and complexity of installation, maintenance and repair, while also minimizing the impact on the structure and the surrounding environment.

- 20 Providing a coupler element at the first retaining element, install in position, the Part A of a new retaining anchor with a 40mm long coupler for securing Part B of new retaining pin, wherein the coupler element is at least partially provided in the structure wall element turned in the reinforced concrete rc structure has an advantage of providing a secure and durable joining of the first and second retaining elements, thereby ensuring the stability and strength of the reinforced concrete structure.

- 25 Providing a second retaining element in the coupler element, mark 20mm from the rc surface and cut the Part A rod Install the Part B of new retaining pin and adjust the coupler outwards to ensure both parts of the new retaining pin to be anchored 20mm, has an advantage of improving the overall strength and stability of the coupler element, thereby reducing the risk of detachment or failure during use.

Providing structural non-shrink grout to the hole in the structure wall element of the rc structure after turning the coupler outwards) has an advantage of improving the load transfer and enhancing the overall stability and strength of the structure.

- 5 Inserting a new stone panel into a gap in the stone panel wall arrangement comprising a step of turning the second retaining element such that a retaining pin of the second retaining element engages in the top groove has an advantage of allowing for quick and easy replacement of damaged or worn panels without the need to dismantle and rebuild the entire stone panel wall arrangement. This can save time and money in maintaining
10 and repairing the wall, as well as minimizing disruption to the surrounding area.

- Fixing the new stone panel into position, the new stone panel having a pre-cut slot at the top to allow the Part B of new retaining pin to secure it for permanently securing the new stone panel by turning the retaining pin 90 degree face down with Allen key has an
15 advantage of providing a secure and long-lasting installation of the stone panel, without the need for specialized tools or equipment. Additionally, the pre-cut slot and retaining pin system provide a seamless and aesthetically pleasing finish to the installation.

- Providing sealant to a slot around the new stone panel to prevent stagnat water has an
20 advantage of reducing the risk of water infiltration and potential damage to underlying structures.

- The step of connecting the safety wire with the structure wall element comprising connecting the safety wire with a bottom bracket of another existing stone panel of the
25 stone panel wall arrangement has an advantage of providing additional support and stability to the stone panel wall arrangement by utilizing the existing structural elements, thereby reducing the need for additional hardware and enhancing the overall efficiency of the installation process.

- 30 The step of connecting the safety wire with the structure wall element comprises forming a closed loop of a piece of wire by connecting two open ends of the piece of

wire are connected with each other, by using a wire end connector clamp, make the loop long enough so that the ends can be closed before the new stone panel is put into its final position, has an advantage of ensuring the secure attachment of the stone panel to the structure wall element, preventing any potential safety hazards caused by the panel's detachment due to harsh weather conditions or other external factors. The closed loop design of the safety wire provides a strong and durable connection between the panel and the structure, increasing the longevity and safety of the building's facade.

The step of connecting the safety wire with the structure wall element comprises providing holes in the new stone panel that connect the lower groove with the first groove and the second groove has an advantage of providing a secure and reliable attachment of the stone panel to the structure wall element, ensuring stability and safety against potential detachment or failure. Additionally, the use of holes in the stone panel enables easy installation and maintenance of the safety wire, reducing the cost and effort of regular inspections and replacements. The configuration of grooves also facilitates the alignment and positioning of the panel during installation, ensuring precise fit and aesthetic appeal. Overall, this feature enhances the performance and durability of the stone panel system, reducing the risk of damage, injury, and liability for the users and owners.

The use of backer rod before sealant application to the stone joints provides an advantage of improving the sealant's performance and longevity. The backer rod serves as a filler, preventing the sealant from being squeezed too deeply into the joint and ensuring that it adheres properly to the surfaces. This reduces the risk of sealant failure due to inadequate adhesion or movement, which can lead to water penetration, air leakage, and structural damage over time. The masking of joints and application of sealant to the perimeter further enhances the water-tightness and durability of the stone panel wall arrangement. The post-con photos and lowering of the BMU platform to ground allow for easy inspection and maintenance of the installation, ensuring that any issues can be quickly identified and addressed.

The application provides a stone panel wall arrangement on a structure wall element, a carrier wall, a structure wall, a façade stone, a pillar, with a plurality of existing stone panels and new stone panels, wherein at least one new stone panel is provided with a pre-cut bottom groove at the bottom of the new stone panel, with a pre-cut top groove at the top of the new stone panel, and with a first side groove at a first side of the new stone panel, and with a second side groove at a second side of the new stone panel, with the bottom groove being positioned on a Piece-A lower bracket that is provided at the structure wall element such that the lower bracket being located in a second area, e.g. lower area, of the gap and with an upper bracket being positioned in the top groove with the upper bracket being connected with the retaining anchor, wherein a safety wire, steel wire, is provided in the bottom groove, in the first side groove, and in the second side groove, wherein the safety wire is connected with the structure wall element.

This provides several advantages for the stone panel wall arrangement. Firstly, the pre-cut grooves on the new stone panels and the lower and upper brackets on the structure wall element enable a precise and secure fit of the panels, reducing the need for additional cutting and shaping during installation. This results in less time and effort required for the installation process, leading to increased efficiency and cost-effectiveness.

Secondly, the safety wire included in the grooves of the new stone panels provides additional reinforcement and support for the structure. This helps to prevent the panels from shifting or falling out of place, ensuring the safety and stability of the installation.

Finally, the use of retaining anchors and steel wires connected to the structure wall element enhances the overall durability and longevity of the stone panel wall arrangement. These components help to absorb any stress or movement in the panels caused by environmental factors such as wind or seismic activity, reducing the risk of damage or failure of the installation over time.

In the case that a stone panel wall arrangement is provided, wherein the safety wire is connected with a lower bracket of an existing stone panel, this has an advantage of providing enhanced stability and security against potential dislodging or damage caused by external factors such as wind, earthquakes, or vibrations. The safety wire acts as a reliable anchor, ensuring that the stone panels remain securely in place for long-lasting durability and protection. Additionally, the use of a lower bracket allows for easy installation and adjustment of the safety wire for optimal customization and flexibility in design. Overall, this feature greatly improves the overall performance and longevity of stone panel wall arrangements, making them a more reliable and safe solution for various applications.

In the case that the safety wire forms a closed loop of a piece of wire with two open ends of the piece of wire being connected with each other, this has an advantage of providing a secure and tamper-proof connection, ensuring even greater safety and reliability of the system.

By incorporating safety wires within the holes that connect the bottom groove with the first side groove and the second side groove on the new stone panel, the installation of the stone panel gains an added advantage of enhanced security and stability. The safety wire acts as a reinforcement, ensuring that the panel remains securely fastened to the mounting surface even under conditions of high wind, seismic activity, or other external stress factors. By being embedded within the stone panel itself, the safety wire also avoids any unsightly external attachment points or detracting from the aesthetic qualities of the panel design.

25

The application provides a stone panel with several advantages for the stone panel wall arrangement. It can be used to close gaps left by missing existing stone panels, providing a convenient and efficient solution for repair or replacement of damaged or deteriorated panels. This can help to restore the appearance and functionality of the stone panel wall arrangement, improving the overall aesthetics and value of the structure.

30

The stone panel can be easily installed onto the structure wall element, reducing the time and cost required for repair or replacement work. This can lead to increased efficiency and cost-effectiveness of the repair or replacement process.

5

The stone panel is durable and long-lasting, ensuring the longevity and stability of the stone panel wall arrangement. This can help to minimize the need for future repairs or replacements, saving time and money in the long run.

- 10 The new stone panel being provided with a pre-cut bottom groove at the bottom of the new stone panel has an advantage of facilitating easy installation and reducing installation time as it allows for easier alignment and placement of the stone panel during installation.

- 15 The new stone panel being provided with a pre-cut top groove at the top of the new stone panel has an advantage of easier installation as it allows for quick and accurate alignment with the preceding panel, reducing installation time and cost.

- 20 The new stone panel being provided with a first side groove at a first side of the new stone panel has an advantage of allowing for interlocking engagement with a correspondingly shaped tongue on a neighboring stone panel, thereby enhancing the overall structural stability and resistance to movement or shifting when installed in a building or other structure.

- 25 The new stone panel being provided with a second side groove at a second side of the new stone panel has an advantage of allowing for easy installation and secure attachment to other stone panels, thereby providing a more stable and durable overall structure.

- 30 The new stone panel being provided with the bottom groove being provided for being positioned on a piece-A lower bracket has an advantage of improved stability and

secure installation of the stone panels, preventing any potential slipping or dislodging, thereby ensuring long-lasting durability and safety.

- 5 The new stone panel being provided with the top groove being provided for being positioned in an upper bracket has an advantage of easier installation and enhanced stability, as it ensures a secure fit and prevents the panel from slipping or moving out of place. Additionally, the top groove provides a seamless appearance without visible brackets or hardware, enhancing the aesthetic appeal of the stone panel installation.
- 10 A channel for a placing a safety wire, a steel wire, provided by the bottom groove, by the first side groove, and by the second side groove has an advantage of ensuring secure fastening and protection against accidental detachment or dislodging of the wire during use, thereby increasing the overall safety and reliability of the device or system in which it is employed.
- 15 Holes that connect the bottom groove with the first side groove and the second side groove has an advantage of allowing for easy installation and removal of the invention's components.
- 20 The application provides the advantage of attachability, as the retaining anchor is attachable to the structure wall element, allowing for easy installation and removal.
- 25 The application ensures the retainment of the retaining anchor in the structure wall element, which enhances the stability and durability of the stone panel wall arrangement.
- The application offers the advantage of triplication, as the process of connecting the upper bracket with the retaining anchor is triplicated, ensuring a robust and secure connection.

The application introduces the advantage of a tunnel, as the retaining anchor is tunnelized into the structure wall element, providing a secure and firm hold.

5 The application presents the advantage of augmentation, as the retaining anchor is augmented into the structure wall element, enhancing the strength and stability of the stone panel wall arrangement.

In a development, the step of connecting the upper bracket with the retaining anchor comprises the following steps:

- 10 -Providing a hole into the structure wall element,
-inserting the retaining anchor into the hole,
-screwing a retaining screw assembly into the retaining anchor,
-cutting the retaining screw assembly in order to create a first retaining element and a second retaining element with a retaining pin,
15 -screwing a coupler sleeve on the first retaining element,
-holding a threaded end of the second retaining element near the coupler sleeve and the threaded end of the first retaining element,
-unscrewing the coupler sleeve from the threaded end of the first retaining element and onto the threaded end of the second retaining element such that the coupler sleeve
20 connects the first retaining element with the second retaining element.

In a development, the step of connecting the lower bracket with the retaining anchor comprises the following steps:

- 25 -Providing a hole into the structure wall element,
-inserting the retaining anchor into the hole,
-screwing a first retaining element into the retaining anchor,
-screwing an adjustment nut on the first retaining element is flush with the inner surface of the next existing stone wall panel),
-putting the new stone panel with the lower bracket onto the first retaining element, such
30 that it contacts the outer surface of the adjustment nut

-screwing a holding nut onto the first retaining element, such that the lower bracket is held between the adjustment nut and the holding nut.

5 In a development, the holding nut is provided with an Allen key hole, so that the holding nut can be turned in the gap between the new stone panel and the existing stone panel.

In a development, the lower bracket is used as upper bracket.

10 In a development, the step of connecting the lower bracket with the retaining anchor comprises the following steps:

- providing a hole into the structure wall element,
- inserting the retaining anchor into the hole,
- screwing a bolt into the retaining anchor,
- 15 -putting a piece-A element on the bolt and secure it with a nut against the structure wall element,
- mounting a piece-B element to the piece-A element, using a second bolt-nut element,
- adjusting the piece-A element with respect to the structure wall element and the piece-B element with respect to the piece-A element such that the outer surface of the next existing stone wall panel is flush with the outer surface of the new stone wall panel,
- 20 -fixing the piece-A element with respect to the structure wall element,
- fixing the piece-B element with respect to the piece-A element.

25 The retaining anchor provides a secure and stable connection between the structure wall element and the new stone panel, preventing any potential movement or detachment of the panel.

The retaining screw assembly allows for easy installation and adjustment of the retaining anchor, ensuring precise positioning of the new stone panel.

The coupler sleeve provides a strong and durable connection between the first and second retaining elements, ensuring the stability and longevity of the stone panel wall arrangement.

- 5 The retaining anchor provides a secure and stable connection between the structure wall element and the lower bracket, preventing any potential movement or detachment of the bracket and the new stone panel.

- 10 The adjustment nut allows for easy and precise adjustment of the position of the new stone panel, ensuring a flush and seamless appearance with the existing stone wall panels.

- 15 The holding nut with an Allen key hole allows for easy and convenient tightening and loosening of the nut, facilitating any necessary adjustments or maintenance.

- The lower bracket can be used as an upper bracket, providing versatility and flexibility in the installation process.

- 20 The bolt and nut elements provide a strong and durable connection between the retaining anchor and the piece-A and piece-B elements, ensuring the stability and longevity of the stone panel wall arrangement.

- 25 The adjustable piece-A and piece-B elements allow for precise positioning and alignment of the new stone panel, ensuring a flush and seamless appearance with the existing stone wall panels.

DEFINITIONS

- 30 The term "retaining anchor" refers to an element that is provided at the structure wall element in order to hold the new stone panel to the structure wall element.

The term "gap" refers to a gap in the stone panel wall arrangement.

The term "second groove" may refer to a groove in which the second bracket is located.

5

The term "first side groove" may refer to a groove at a side of the stone panel and/or a groove at a side of the stone panel.

The term "second side groove" may refer to a groove at a side of the stone panel, wherein the safety wire is provided therein.

10

A "safety catch netting" designates a netting that is provided in the gap between the stone panel and the structure wall element, and that is provided with a retaining element, which is used to secure the stone panel to the structure wall element.

15

A "BMU platform" designates a platform that is used for mounting a retaining anchor.

A "suction cup" designates a suction cup that is used for attaching a stone panel to a structure wall element.

20

An "existing sealant" designates a sealant that is used to seal the gap between the stone panel and the structure wall element.

An "existing holding element" designates a retaining anchor that is already present in the structure wall element.

25

A "safety belt" designates a belt that is used to secure a person to a seat in a vehicle.

The "ground" designates the ground of the structure wall element.

30

A building maintenance unit ("BMU") can be an automatic, remote-controlled, or mechanical device, often suspended from the roof, which moves systematically over some surface of a structure while carrying human window washers or mechanical robots to maintain or clean the covered surfaces. Other types of BMU include vehicles
5 with wheeled platforms that can be moved on a ground next to the building.

The safety wire, also called "SS Safety Wire", can be made of metal, such as steel or stainless steel, or of plastic or composite.

10 The term "stone panel wall arrangement" is used herein to refer to a wall arrangement on a structure wall element. The term "existing stone panel" is used herein to refer to a stone panel that has not yet been replaced. The terms "retaining anchor" or "retainer anchor" are used herein to refer to an element that enables the insertion of a retaining element into a gap in the structure wall element. The term "gap" designates an opening
15 that implies a breach or defect, for example in the sense that an existing wall element has been partly removed. The term "new stone panel" is used herein to refer to a new stone panel that is installed on a structure wall element for closing such a gap. The term "bottom groove" refers to a groove in the bottom of the stone panel, whereas the term "bottom of the stone panel" may refer to the bottom of the stone panel. Replacing stone
20 panels in existing stone panel wall arrangements is a dangerous task, because of the heavy weight of the stone panels that present a danger to persons that walk underneath the replacement work site.

A "suction cup" designates a cup made of flexible material, such as rubber, that uses suction as an adhesive means. A "safety wire", in the sense of a locking-wire designates
25 a type of positive locking device that prevents stone wall panels from falling out due to vibration and other forces.

The specification and the claims use different, and sometimes more general terms for designating features of the application. A "bottom groove" can be a "second groove" and a "second groove" can means a "bottom groove". The same applies to a "top
30 groove" that can be a "first groove", and a "first groove" can be a "top groove".

A “second bracket” in the claims can be a “lower bracket”, and a “first bracket” can mean an “upper bracket”.

- 5 A “connector element” can be a “bolt”, a “coupler element” can be a “coupler sleeve”, and a “second retaining element” can be a “retaining pin”.

A “holding element” can be a “holding nut”, while an “adjustment element” can be an “adjustment nut”.

10

A “racking key plate” is one form of a “racking key tool”.

An “opening” can be provided in the form of a “slit” or a “hole”.

15 BRIEF DESCRIPTION OF DRAWINGS

The present disclosure is illustrated by way of example and not limited in the accompanying figures in which like reference numerals indicate similar elements. Embodiments of the application will now be described with reference to the attached
20 drawings:

Figure 1 shows a perspective view of a work area for replacing an existing stone panel in a stone panel wall arrangement on a structure wall element,

Figure 2 shows a front view of the stone panel wall arrangement of Fig. 1,

- 25 Figure 3 shows a front view that illustrates the use of a safety wire in a new panel that is used to close a gap in the stone panel wall arrangement of Fig. 2.,

Figure 4 shows a cross-sectional view of an upper bracket of Fig. 2,

Figure 5 shows a cross-sectional view of a lower bracket of Fig. 2,

Figure 6 shows a perspective view of the lower bracket of Fig. 5,

- 30 Figure 7 shows another perspective view of the upper bracket of Fig. 5,

Figure 8 shows several views of another embodiment of a lower bracket,

Fig. 9 illustrates a further method for providing a retaining anchor in a structure wall element,

Figure 10 shows a view of details of the retaining anchor 4 in the structure wall element of Fig. 9

5 Figure 11 shows another view of the embodiment of Fig. 10,

Figure 12 shows another view of the embodiment of Figs. 10 and 11;

Figure 13 shows another view of the embodiment of Figs. 10, 11 and 12,

Figure 14 shows another embodiment of a method for providing a retaining anchor in a structure wall element,

10 Figure 15 shows another embodiment of a method for providing a retaining anchor in a structure wall element,

Figure 16 shows another embodiment of a stone panel according to the invention;

Figure 17 shows a bracket of another bracket fastener assembly of the invention;

15 Figure 18 shows another embodiment of mounting a stone panel to a structure wall element;

Figure 19 shows a further mounting step of the embodiment of Fig. 18;

Figure 20 shows a bracket of another bracket fastener assembly of the invention;

Figure 21 shows another embodiment of mounting a stone panel to a structure wall element;

20 Figure 22 shows another embodiment of mounting a stone panel to a structure wall element,

Figure 23 shows a step in another embodiment of mounting a stone panel in a stone panel wall arrangement on a structure wall element,

Figure 24 shows another step of mounting the stone panel of Fig. 23,

25 Figure 25 shows another step of mounting the stone panel of Figs. 23 and 24,

Figure 26 shows a side view of a racking key plate of Fig. 25,

Figure 27 shows the result of mounting the stone panel of Figs. 23 to 25 on the structure wall element,

Figure 28 shows the bracket fastener assembly of Fig. 27 in a schematic view, and

30 Figure 29 shows another embodiment of a safety wire.

Detailed Description of Figures

Figure 1 illustrates a method for replacing a damaged stone panel on a building's façade 1. The process involves barricading an area of work under a gap 6 to ensure sufficient space and covering the area of work ground 24 right below the stone panels 2 with protective panels made of polyfoam and plywood (not shown in Fig. 1). A traffic marshal is assigned to control the ground traffic for safety purposes.

To safely remove an existing stone panel 2, a safety catch netting (not shown in Fig. 1) is installed between the surface of a structure wall element 3 and a BMU platform 19 of a BMU 100 right below the area of work. At least one suction cup is attached to the existing stone 2 panel to secure it in place. Existing sealant 21 (not shown in Fig. 1) around the existing stone panel 2 is cut away to expose the existing holding elements 22 in the form of brackets or pins of the existing stone panel 2.

A safety belt (not shown in Fig. 1) is installed around the existing stone panel 2 and is connected to both the structure wall element 3 and the BMU platform 19. The existing holding elements 22 are then removed, using a cutting tool (not shown in Fig. 1). The existing stone panel 2 is moved to the BMU platform 19 and lowered to the ground 24. The safety belt is disconnected from the BMU platform 19, and the existing stone panel 2 is unloaded.

To replace the damaged existing stone panel 2, a new stone panel 7 (not shown in Fig. 1) is loaded onto the BMU platform 19 and a safety belt is installed around it. The safety belt is connected to the BMU platform 19 and brought up to the gap 6 for replacement. The safety belt is then disconnected from the BMU platform 19 and connected to the structure wall element 3 to secure the new stone panel 7 in place, as can be seen for example in Figs. 2 to 8.

The new stone panel 7 is then fixed to the structure wall element 3, as described in particular with reference to Figs. 3 to 29. After that, new sealant 101 is installed around

the new stone panel 7 to prevent water collection behind the stone panel arrangement 1.

Figures 2 to 8 illustrate a method for replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3, such as a carrier wall, a façade stone, or a pillar. The method comprises the following steps.

One step is to provide a retaining anchor, also referred to as a wall anchor 4, in the structure wall element 3, which is located in a first area, referred to as the upper area, of a gap 6 in the stone panel wall arrangement 1.

10

Next, a new stone panel 7 is inserted into the gap 6 in the stone panel wall arrangement. The new stone panel 7 is provided with a pre-cut bottom groove 8 at the bottom 9 of the new stone panel 7, a pre-cut top groove 10 at the top 11 of the new stone panel 7, a first side groove 12 at a first side of the new stone panel 7, and a second side groove 13 at a second side of the new stone panel 7. The bottom groove 8 is positioned on a lower bracket 28, also referred to as “piece-A” in some of the Figures, provided at the structure wall element 3. The lower bracket 28 is located in a second area, referred to as the lower area 26, of the gap.

15

Then, an upper bracket 29 is inserted into the top groove 10, and connected to the retaining anchor 4. A safety wire, also called “SS Safety Wire”, made of steel wire 27, is provided in the bottom groove 8, in the first side groove 12, and in the second side groove 13. The method further includes connecting the safety wire 27 with the structure wall element 3, for example by slinging it around existing holding elements 22 of other existing stone panels 2.

25

Figure 2 shows a stone panel wall arrangement on a structure wall element. The method depicted in Figure 2 is for replacing an existing stone panel in the stone panel wall arrangement.

In the figure, a retaining anchor (not shown) is provided in the structure wall element, located in a first area of a gap in the stone panel wall arrangement. A new stone panel is inserted into the gap, which is provided with a first groove and a second groove. The new stone panel is secured to the structure wall element using a first bracket and a second bracket. The first bracket is inserted into the first groove of the new stone panel and connected with the retaining anchor using a connector element provided in the retaining anchor. Similarly, the second bracket is inserted into the second groove of the new stone panel and connected with the retaining anchor using a connector element. In this embodiment, a total of at least four retaining anchors are provided in the structure wall element. Two retaining anchors are located in the first area of the gap, at a horizontal distance from each other, and two retaining anchors are located in the second area of the gap, also at a horizontal distance from each other. This allows for a secure attachment of the new stone panel to the structure wall element. To ensure proper alignment and adjustment of the new stone panel, adjustment elements are provided on the connector elements of each retaining anchor. These adjustment elements allow for fine-tuning the position of the new stone panel to ensure it is flush with the neighboring existing stone panels.

Additionally, the new stone panel may be provided with a second groove at the bottom, a first groove at the top, and a safety wire may be inserted into the second groove. The safety wire is then connected with the structure wall element, providing an extra level of stability and security for the stone panel wall arrangement.

Overall, Figure 2 illustrates a method for replacing an existing stone panel in a stone panel wall arrangement using retaining anchors, brackets, and connector elements to securely attach the new stone panel to the structure wall element. The use of adjustment elements and safety wires further enhances the stability and alignment of the stone panel wall arrangement.

Fig. 3 illustrates the provision of the safety wire 27 in the bottom groove 8, in the first side groove 12, and in the second side groove 13. The step of connecting the safety wire 27 with the structure wall element 3 can have one or more steps:

- Connecting the safety wire 27 with a lower bracket 22 of another existing stone panel 2 of the stone panel wall arrangement 1,
 - Forming a closed loop of a piece of wire 27 by connecting two open ends of the piece of wire 27 with each other, using a wire end connector clamp. The loop should be long enough so that the ends can be closed before the new stone panel 7 is put into its final position 6,
 - Openings in the form of holes 102 or additional slanted slits are provided in the new stone panel 7, the openings connecting the bottom groove 8 with the first side groove 12 and the second side groove 13 and/or that connect the top groove 10 with the first side groove 12 and the second side groove 13.
- Figure 3 shows a stone panel wall arrangement on a structure wall element according to the present invention. The arrangement includes a plurality of existing stone panels (not shown) and a new stone panel (7). The new stone panel is used to replace an existing stone panels in the wall arrangement. It is provided with a second groove at the bottom and a first groove at the top. The second groove is positioned on a second bracket (not shown) provided at the structure wall element. The first groove is positioned in a first bracket (not shown) that is connected with a retaining anchor (not shown) in the structure wall element. Stone panel 7 is also inserted into a gap in the stone panel wall arrangement. It is provided with a second groove at the bottom, a first groove at the top, and a first side groove at a first side. The second groove is positioned on a second bracket (not shown) provided at the structure wall element. The first groove is positioned in a first bracket (not shown) that is connected with a retaining anchor (not shown) in the structure wall element. The first side groove is used to hold a safety wire (not shown) that is connected with the structure wall element. Stone panel 7 is inserted into a gap in the stone panel wall arrangement. It is provided with a second groove at the bottom, a first groove at the top, a first side groove at a first side, and a second side groove at a second side. The second groove is positioned on a second bracket (not

shown) provided at the structure wall element. The first groove is positioned in a first bracket (not shown) that is connected with a retaining anchor (not shown) in the structure wall element. The first side groove and the second side groove are used to hold a safety wire (not shown) that is connected with the structure wall element.

5

The safety wire forms a closed loop, with the two open ends of the wire connected with each other. The safety wire is placed within openings in the stone panels that connect the grooves, ensuring that the stone panels are securely held in place.

- 10 The stone panel wall arrangement shown in Figure 3 provides a secure and aesthetically pleasing replacement for existing stone panels in the wall arrangement. The use of brackets, retaining anchors, and safety wires ensures that the new stone panels are securely attached to the structure wall element, while maintaining the overall appearance of the wall arrangement.

15

Fig. 4 further illustrates a detail of the method for replacing an existing stone panel in a stone panel wall arrangement 1 on a structure wall element, such as a carrier wall 3, a structure wall, a façade stone, or a pillar, as shown in Figs. 2 to 8. The method includes the following steps: providing a retaining anchor in the form of , e.g. the wall anchor 4, in the structure wall element 3, the retaining anchor 4 being located in a first area, the upper area of the gap 6 in the stone panel wall arrangement 1; inserting the new stone panel 7 into the gap 6 in the stone panel wall arrangement 1, wherein the new stone panel 7 is provided with a pre-cut top groove 10 at the top 11, a first side groove 12 at a first side 14, and a second side groove 13 at a second side 14. After positioning the bottom groove 9 on a lower bracket 28 provided at the structure wall element 3, there is the step of inserting the upper bracket 29 into the top groove 10. A step of connecting the upper bracket 29 with the retaining anchor 4 follows, wherein safety wire in the form of a steel wire 27 is provided in the bottom groove 8, in the first side groove 12, and in the second side groove 13. The safety wire 27 is then connected with the structure wall element 3.

30

Figure 4 shows a bracket fastener assembly for securing a new stone panel to a structure wall element in a stone panel wall arrangement. The bracket fastener assembly includes a connector element, an adjustment element, a first bracket or a second bracket for the stone panel, and a holding element. The holding element is designed with a roughened cylindrical surface that provides form-locking actuation.

This bracket fastener assembly provides a reliable and efficient method for replacing an existing stone panel in a stone panel wall arrangement. It ensures a secure attachment of the new stone panel to the structure wall element, allowing for a seamless integration with the existing stone panels.

Figure 4 shows a bracket fastener assembly for securing a new stone panel 7 to a structure wall element 3 in a stone panel wall arrangement 1. The bracket fastener assembly includes a connector element, an adjustment element, a first bracket 29 for the stone panel 7, and a holding element. This bracket fastener assembly provides a reliable and efficient method for replacing an existing stone panel 2 in a stone panel wall arrangement 1. It ensures a secure attachment of the new stone panel 7 to the structure wall element 3, allowing for a seamless integration with the existing stone panels.

Fig. 5 shows the new stone panel 7 with a pre-cut bottom groove 8 at the bottom 9 of the new stone panel 7 being positioned on a lower bracket 28 that is provided at the structure wall element 3, the lower bracket 28 being located in a second area, a lower area of the gap 6. One can see here that the steel wire 27 is provided in the bottom groove 8, in the first side groove 12, and in the second side groove 13.

Fig. 6 and Fig. 7 show perspective views of the lower bracket 28 in greater detail. The lower bracket 28 has a horizontal basis 49, that extends vertically upwards into an upper wing 50 on one lateral edge and vertically downwards into a lower wing 51 on the opposite lateral edge. A mounting hole 52 is centrally provided in the lower wing 51. The horizontal basis 49, the upper wing 50, and the lower wing 51 have each a rectangular

shape. The lower bracket 28 is bent from one single sheet of stainless steel with a thickness of a few millimeters, preferably 3mm.

5 The lower bracket 28 of Figs. 6 and 7 can also be used as an upper bracket 29, simply by turning it upside down.

Fig. 8 shows another embodiment of a lower bracket 28 that is provided in a retaining anchor 4 in the structure wall element 3, with the retaining anchor 4 being located in a second area 26, the lower area of the gap 6 in the stone panel wall arrangement 1.

10 The bottom groove 8 is positioned on the lower bracket 28, which comprises a piece-A element 60 provided at the structure wall element 3 by a bolt 63 that is provided in the retaining anchor 4, and a piece-B element 61 provided at the bottom groove 8. The piece-A element 60 and the piece-B element 61 are interconnected by a bolt-nut-element 62.

15 The piece-A element 60 is made from an L-shaped stainless steel profile that comprises an elongated hole 64 that is arranged longitudinally, while the piece-B element 61 has essentially the same shape as the piece-A element 60, but it comprises an elongated hole 65 that is arranged in a transverse direction. The bolt-nut-element 62 is taken up in
20 the elongated hole 64 and in the elongated hole 65, allowing the piece-A element 60 and the piece-B element 61 to be moved against each other longitudinally and transversely before the bolt-nut-element 62 being tightened.

25 The lower bracket 28 of Fig. 8 can also be used as an upper bracket 29, simply by turning it upside down.

Fig. 9 depicts a further method for providing a retaining anchor 4 in the structure wall element 3, the retaining anchor 4 being located in a first area 5, the upper area of a gap 6 in the stone panel wall arrangement 1; and inserting a new stone panel 7 into the gap
30 6. The new stone panel 7 is provided with a pre-cut top groove 10 at the top 11. After having positioned the bottom groove 8 on a lower bracket 28 provided at the structure

wall element 3, an upper bracket 29 is inserted into the top groove 10, and the upper bracket 29 being connected with the retaining anchor 4 as described in the following. The upper bracket 29 comprises a first retaining element in the form of a threaded screw 70, a threaded coupler sleeve 71, and a second retaining element 72 that is provided with a retaining pin 73. An outer end 103 of the threaded second retaining element 72 is provided with a hexagonal keyhole. In Fig. 9, the retaining pin 73 is shown in an "Open Position", being turned horizontally.

After inserting the new stone panel 7 into the gap 6 in the stone panel wall arrangement 1, the second retaining element 72 is turned such that the retaining pin 73 engages in the top groove 10. The new stone panel 7 has a pre-cut slot 10 at the top to allow the of the retaining pin 73 to secure it. The new stone panel 7 is permanently secured by turning the retaining pin 73 by 90 degrees facing down into "Closed Position" with an Allen key that is inserted into the hexagonal hole.

The first retaining element in the form of a threaded screw 70, the threaded coupler sleeve 71, and the second retaining element 72 can be turned with respect to each other such that a distance 104 between the new stone panel 7 and the structure wall element 3 can be adjusted such that the outer surfaces of the new stone panel 7 and the next existing stone panel 2 are essentially flush, i.e. that the outer surface of the stone panel wall arrangement 1 looks even.

Figures 10 to 13 provide details about providing the retaining anchor 4 in the structure wall element 3 of Fig. 9. The retaining anchor 4 is located in a drilled hole 76 in the structure wall element 3. The first retaining element in the form of a threaded screw 70 with a threaded coupler sleeve 71 is screwed into the retaining anchor 4. In a further step shown in Fig. 12, the second retaining element 72 is provided at such a distance from the threaded screw 70 that a distance 104 between the new stone panel 7 and the structure wall element 3 can be adjusted such that the outer surfaces of the new stone panel 7 and the next existing stone panel 2 are essentially flush, i.e. that the outer surface of the stone panel wall arrangement 1 looks even.

As shown with dotted lines in Fig. 13, the threaded coupler sleeve 71 is turned from the position in Fig. 12 such that it engages with the threading of the second retaining element 72. After that, the the second retaining element 72 is turned such that the retaining pin 73 is facing horizontally, in an “Open Position”.

After inserting the new stone panel 7 into the gap 6 in the stone panel wall arrangement 1, the second retaining element 72 is turned such that the retaining pin 73 engages in the top groove 10, as shown in Fig. 9.

Fig. 14 shows a further embodiment for providing a lower bracket 28 at the structure wall element 3, the lower bracket 28 being located in a second area of the gap 6. The retaining anchor 4 is provided with a threaded first retaining element 70 that comes with an adjustment nut 92. The lower bracket 28 is secured between the adjustment nut 92 and a holding nut 90, that comes with an Allen key hole 76.

The adjustment nut 92 is provided at such a distance from the the structure wall element 3 that a distance 104 between the lower bracket 28 and the structure wall element 3 that the outer surfaces of the new stone panel 7 and the next existing stone panel 2 are essentially flush, i.e. that the outer surface of the stone panel wall arrangement 1 looks even.

Before or after inserting the new stone panel 7 into the gap 6 in the stone panel wall arrangement 1, the holding nut 90 is turned against the lower bracket 28 and the adjustment nut 92 such that the new stone panel 7 is fixed with respect to the structure wall element 3.

Figure 15 shows the new stone panel 7 into a gap 6 in the stone panel 2 wall arrangement 1 of Fig. 8 in greater detail. As one can see here, the retaining anchor 4 and the bolt 63 form an M10 expansion bolt assembly. The bolt-nut-element 62 in the elongated hole 64 and in the elongated hole 65 allow the piece-A element 60 and the

piece-B element 61 to be moved against each other longitudinally and transversely until the outer surfaces of the new stone panel 7 and the next existing stone panel 2 are essentially flush, i.e. that the outer surface of the stone panel wall arrangement 1 looks even. After that, the bolt-nut-element 62 being tightened, such that the new stone panel 7 is fixed with respect to the structure wall element 3.

Figure 16 shows a perspective view representation of a new stone panel 7 for replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3 (not shown here). The length of an inner flange 95 of the top groove 10 or the bottom groove 8 is shorter than the length of an outer flange 96 of the top groove 10 or the bottom groove 8. The new stone panel 7 can be used for the embodiments shown in Figs. 4, 5, 9, 18, 19, 21, 22, 23, 24, 25, 27, and 29.

When installed at the structure wall element, the lower bracket 28 and the upper bracket 29 are arranged approximately at distances from each other as shown in Fig. 1. The overall length and height of the new stone panel 7 can about 1.2 meters, and they can greatly vary from 0.5 meters to 2 meters and also be different from each other.

Figure 17 shows the the upper bracket 29 in greater detail. The upper bracket 29 is inserted into the top groove 10 of the new stone panel 7 and connected to the retaining anchor 4 located in a first area 5 of the gap 6.

As one can see, the upper bracket 29 is made of a metal sheet, bent in the form of a straight Z, with a mounting hole in one of the two legs of the upper bracket 29. Dimensions of the upper bracket 29 are given in the Fig. 17.

Figure 18 shows a schematic representation of a step of the method for replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3. The figure illustrates the step involved in securing a new stone panel 7 into the gap 6 of the stone panel wall arrangement 1. A new stone panel 7 is inserted into the gap 6, which is equipped with a top groove 10 at the top 11. The new stone panel 7 is then

secured to the structure wall element 3 using an upper bracket 29. To secure the new stone panel 7, an upper bracket 29 is inserted into the top groove 10 and connected to the retaining anchor 4. The bottom groove 8 is positioned on a lower bracket 28 located in a second area 26 of the gap 6, which is not shown here. The method for securing the new stone panel 7 to the structure wall element 3 in this case can be similar to the method described above for the upper bracket 29, but using a lower bracket 28 instead.

Figure 19 shows a schematic representation of one of the final steps of the method for replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3. The figure illustrates the state after securing a new stone panel 7 into the gap 6 of the stone panel wall arrangement 1. In the figure, a retaining anchor 4 is provided in the structure wall element 3, located in a first area 5 of the gap 6. A new stone panel 7 which is equipped with a bottom groove 8 at the bottom 9 and a top groove 10 at the top 11 was inserted into the gap 6.

The new stone panel 7 is then secured to the structure wall element 3 using an upper bracket 29 and a lower bracket 28. To secure the new stone panel 7, an upper bracket 29 is inserted into the top groove 10 and connected to the retaining anchor 4. This connection is achieved by providing a bolt 63 in the retaining anchor 4, followed by placing an adjustment nut on the bolt 63. The protruding end of the bolt 63 is inserted into a mounting hole 52 of the upper bracket 29, and a holding nut 90 is provided on the protruding end of the bolt 63. The holding nut 90 is tightened against the adjustment nut 92 using a racking key plate (not shown here) inserted into the gap between the new stone panel 7 and a neighboring existing stone panel 2.

Additionally, it is mentioned that the bottom groove 8 is positioned on a lower bracket 28 located in a second area 26 of the gap 6. The method for securing the new stone panel 7 to the structure wall element 3 in this case is similar to the method described above for the upper bracket 29. A lower bracket 28 is inserted into the bottom groove 8, and it is connected to the retaining anchor 4 using a bolt 63, an adjustment nut 92, a mounting hole 52, a holding nut 90, and a racking key plate 94.

Figure 19 provides a visual representation of result of the steps involved in replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3.

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Figure 20 shows a schematic representation of the method for replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3, as described in claim 6. The figure illustrates the steps involved in securing the new stone panel 7 to the structure wall element 3 using an upper bracket 29. The upper bracket 29 is inserted into the top groove 10 of the new stone panel 7 and connected to the retaining anchor 4 located in the first area 5 of the gap 6. This connection is achieved by providing a bolt 63 in the retaining anchor 4, followed by placing a adjustment nut 92 on the bolt 63. The protruding end of the bolt 63 is then inserted into a mounting hole 52 of the upper bracket 29, and a holding nut 90 is provided on the protruding end of the bolt 63. Finally, the holding nut 90 is tightened against the adjustment nut 92 using a racking key plate 94 inserted into the gap 6 between the new stone panel 7 and a neighboring existing stone panel 2.

As one can see, the lower bracket 28 is made of a metal sheet, bent in the form of a straight Z, with a mounting hole in one of the two legs of the lower bracket 28 and with two reinforcement triangles beeing welded in between its other leg and the middle part. Dimensions of the lower bracket 28 are given in the Fig. 20.

Figure 21 shows a schematic representation of one step of the method for replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3, The figure illustrates one step of securing a new stone panel 7 into the gap 6 of the stone panel wall arrangement 1. The new stone panel 7, which has a bottom groove 8 at the bottom 9 and a top groove 10 at the top 11, is inserted into the gap 6. The bottom groove 8 of the new stone panel 7 is positioned on a lower bracket 28 located in the second area 26 of the gap 6.

Figure 22 shows a schematic representation of the result of replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3. The figure illustrates the steps involved in securing a new stone panel 7 into the gap 6 of the stone panel wall arrangement 1. The figure depicts a structure wall element 3 with a gap 6 in the stone panel wall arrangement 1. A retaining anchor 4 is provided in the structure wall element 3, located in the first area 5 of the gap 6. The new stone panel 7, which has a bottom groove 8 at the bottom 9 and a top groove 10 at the top 11, is inserted into the gap 6. The bottom groove 8 of the new stone panel 7 is positioned on a lower bracket 28 provided at the structure wall element 3, located in the second area 26 of the gap 6. The method for securing the new stone panel 7 to the structure wall element 3 in this case involves inserting a lower bracket 28 into the bottom groove 8 and connecting it to the retaining anchor 4 using a bolt 63, an adjustment nut 92, a mounting hole 52, a protruding end of the bolt 63, a holding nut 90, and a racking key plate 94, similar to the steps described above. Figure 22 provides a visual representation of the steps involved in replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3.

Figures 23 to 27 show a schematic representation of the method for replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3.

As one can see in Fig. 23, a new stone panel 7 is secured to the structure wall element 3 using an upper bracket 29. The upper bracket 29 is inserted into the top groove 10 of the new stone panel 7 and connected to the retaining anchor 4 located in the first area 5 of the gap 6.

As one can see in Figure 24, the upper bracket 29 is inserted into the top groove 10 of the new stone panel 7 and going to be connected to the retaining anchor 4 located in the first area 5 of the gap 6. This connection is achieved by providing a bolt 63 in the retaining anchor 4, followed by placing an adjustment nut 92 on the bolt 63.

Figure 25 shows the bolt 63 being provided in the retaining anchor 4, followed by placing an adjustment nut 92 on the bolt 63. The protruding end of the bolt 63 is then inserted into a mounting hole 52 of the upper bracket 29, and a holding nut 90 is provided on the protruding end of the bolt 63. Finally, the holding nut 90 is tightened against the adjustment nut 92 using a racking key plate 94 inserted into the gap 6 between the new stone panel 7 and a neighboring existing stone panel 2.

Figure 26 shows a side view of the racking key plate 94 of Fig. 25. The toothed area of the racking key plate 94 is depicted by providing a dotted line which stands for the valleys of the teeth in the toothed area, while the tips of the teeth are located at the bottom area of the racking key plate 94 of Fig. 25.

Figure 27 shows a schematic representation of one of the final steps of the method for replacing an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3. The holding nut 90 is tightened against the adjustment nut 92 using a racking key plate 94 inserted into the gap 6 between the new stone panel 7 and a neighboring existing stone panel 2. Not shown here is a lower bracket 28 that is positioned in the second area 26 of the gap 6, with the bottom groove 8 of the new stone panel 7 located on the lower bracket 28. The lower bracket 28 is connected to the retaining anchor 4 using a similar process as described for the upper bracket 29. Figure 27 provides a visual representation of the steps involved in replacing an existing stone panel 2 in a stone panel wall arrangement 1, highlighting the use of retaining anchors, upper and lower brackets, bolts, adjustment nuts, holding nuts, and a racking key plate 94.

Fig. 28 shows the bracket fastener assembly with a bolt 63 of Fig. 27 in a schematic view. The holding nut 90 is tightened against the adjustment nut 92 using the racking key plate 94 inserted into the gap 6, between the new stone panel 7 and a neighboring existing stone panel 2. As one can see in Fig. 28, the holding nut 90 comprises a roughened cylindrical surface for a form-locking in the form of a toothed area. The toothed area of the racking key plate 94 is depicted by providing a dotted line which

stands for the valleys of the teeth in the toothed area, while the tips of the teeth are located at the bottom area of the racking key plate 94 of Fig. 25. The toothed area of the racking key plate 94 meshes with a roughened cylindrical surface of the holding nut 90, thereby providing a form-locking connection that allows a movement of the holding nut 90 that is hidden behind the outer flange 96 on the outer side of the stone panel.

As shown partly in Fig. 29, to replace an existing stone panel 2 in a stone panel wall arrangement 1 on a structure wall element 3, the following method can be used:

Placement of Retaining Anchors: Install four or more retaining anchors 4 in the structure wall element 3. Position these anchors within the gap 6 of the stone panel wall arrangement 1, with two in a first area 5 and two in a second area 26, each set spaced horizontally.

Bolt and Adjustment Nut Installation: Insert a bolt 63 into each retaining anchor 4. Then, attach an adjustment nut 92 to each bolt 63.

Inserting the New Stone Panel 7 involves several steps.

Upper and Lower Brackets: Insert two upper brackets 29 into the top groove 10 of the new stone panel 7, spaced horizontally. Similarly, place two lower brackets 28 in the bottom groove 8 of the new stone panel 7, also spaced horizontally.

Attaching to Bolts: Insert the protruding ends of the bolts 63 in the first area 5 into a mounting hole 52 of each upper bracket 29. Insert the protruding ends of the bolts 63 in the second area 26 into a mounting hole 52 of each lower bracket 28.

Securing with Holding Nuts: Provide a holding nut 90 on the protruding end of each bolt 63.

Panel Placement and Tightening:

Push the new stone panel 7 into the gap 6 until the upper and lower brackets contact their corresponding adjustment nuts 92.

Tighten each holding nut 90 against its respective adjustment nut 92.

Optional Step – Using a Racking Key Plate: Optionally, use a racking key plate 94.

5 Insert it into the gap 6 between the new stone panel 7 and a neighboring existing stone panel 2. This or another suitable method may be employed for turning the holding nuts 90.

10 As one can see in Fig. 29, the safety wire 27 is provided in the bottom groove 8, in the first side groove 12, and in the second side groove 13, wherein the safety wire 27 is connected with the structure wall element 3. Openings in the form of vertically inclined slits or holes connect the top groove 10 with the first side groove 12 and the second side groove 13. These slits provide a channel for a guiding the safety wire 27 to further elements that connect the safety wire 27 with the structure wall element 3 in an area above the new stone panel 7. Such channels for placing the safety wire 27 can also be
15 provided by holes or slits that connect the bottom groove 8 with the first side groove 12 and the second side groove 13.

In still other embodiments, combinations of elements of the earlier described embodiments can be used. For example, the brackets 28 and 29 in Figures 23 to 27
20 can be replaced by the brackets 28 and 29 in Figures 17 to 22 so that their profile is adapted to provide a larger space between the stone panels 2 or 7 and the structure wall element 3.

25 The distance 104 between the old stone panels to concrete structures is often wider than indicated in the drawings. It is often wider than 75mm and varies case to case. The width of the slits between neighboring stone panels can often be as small as 3mm or even smaller than that. The brackets 28 and 29 in Figures 23 to 27 are especially useful for such small slits.

30 The above mentioned embodiments and the claims can be combined with the following list of feature combinations that are provided in the form of an itemized list:

Item 1: Any Method according to the above-mentioned embodiments and the claims below, comprising a step of creating a gap (6) by removing an existing stone panel (2) from the structure wall element (3).

5

2. Method according to item 15, comprising one or more of the following steps:

- barricading an area of work (16) under the gap (6) (to ensure sufficient space), and
- covering the area of work (16) with protective panels (17).

10 3. Method according to item 1 or item 2, comprising one or more of the following steps:

- assigning a traffic marshall to control a ground traffic,
- identifying the location of the existing stone panel (2) that needs to be replaced,
- providing a safety catch netting (18) between a surface of the structure wall element (3) and a BMU platform (19) right below the area of work (16).

15

4. Method according to any of the aforementioned items, comprising one or more of the following steps:

- providing (installing and securing) at least one suction cup (20) to the existing stone panel (2),

20 - removing existing sealant (21), thereby exposing existing holding elements (22) of the existing stone panel (2),

- installing a safety belt (23) around the existing stone panel (2) and
- connecting the safety belt (23) with a structure wall element (3).

25 5. Method according to any of the aforementioned items, comprising one or more of the following steps:

- connecting the safety belt (23) with the BMU platform (19),
- removing the existing holding elements (22),
- moving the existing stone panel (2) to the BMU platform (19),

30 - lowering the BMU platform (19) to a ground (24),

- disconnecting the safety belt (23) from the BMU platform (19), and

- unloading the existing stone panel (2) from the BMU platform (19).

6. Method according to any of the aforementioned items, comprising one or more of the following steps:

- 5 - loading the new stone panel (7) to a BMU platform (19),
 - installing a safety belt (23) around the new stone panel (7),
 - connecting the safety belt (23) with the BMU platform (19),
 and
 - bringing the BMU platform (19) up to the gap (6),
10 - disconnecting the safety belt (23) from the BMU platform (19),
 - connecting the safety belt (23) with a structure wall element (3).

7. Method according to one of the aforementioned items, comprising the step of providing (fixing in place) a rubber element to the second bracket (28).

15

8. Method according to one of the aforementioned items, comprising the step of providing grout to the hole (76) in the structure wall element (3).

9. Method according to one of the items 1 to 8, wherein the step of connecting the
20 safety wire (27) with the structure wall element (3) comprises connecting the safety wire
 (27) with a second bracket of another existing stone panel (2) of the stone panel wall
 arrangement (1).

10. Method according to one of the items 1 to 9, wherein the step of connecting the
25 safety wire (27) with the structure wall element (3) comprises forming a closed loop of a
 piece of wire by connecting two open ends of the piece of wire are connected with each
 other.

11. Method according to one of the items 1 to 10, wherein the step of connecting the
30 safety wire (27) with the structure wall element (3) comprises providing holes in the new

stone panel (7) that connect the lower groove with the first groove and the second groove.

REFERENCE NUMERAL LIST

	1 stone panel wall arrangement		28 lower bracket
	2 existing stone panel		28 second bracket
5	3 structure wall element		29 upper bracket
	4 retaining anchor	35	29 first bracket
	5 first area		30 first retaining element
	6 gap		31 coupler element
	7 new stone panel		32 second retaining element
10	8 bottom groove	40	33 threaded key plate
	8 second groove		49 horizontal basis
	9 bottom		50 upper wing
	10 top groove		51 lower wing
	10 first groove		52 mounting hole
15	11 top	45	60 piece-A element
	12 first side groove		61 piece-B element
	13 second side groove		62 bolt-nut-element
	14 first side		63 bolt
	15 second side		63 connector element
20	16 area of work	50	64 elongated hole
	17 protective panels		70 threaded screw
	18 safety catch netting		70 first retaining element
	19 BMU platform		31 coupler element
	20 suction cup		31 coupler sleeve
25	21 existing sealant		32 second retaining element
	22 existing holding elements	55	32 retaining pin
	23 safety belt		75 retaining screw assembly
	24 ground		76 hole
	25 first lower bracket element		90 holding nut
30	26 second area	60	92 adjustment nut
	27 safety wire		92 adjustment element
			93 washer
			94 racking key plate

2TNN 014 SG

68

94 racking key tool

101 new sealant

95 inner flange

102 opening

96 outer flange

102 hole

97 outer surface

10 102 slit

5 98 inner surface

103 outer end

100 BMU

104 distance

Claims

1. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3), the method comprising the following steps:

- 5 - providing a retaining anchor (4) in the structure wall element (3), the retaining anchor (4) being located in a first area (5) of a gap (6) in the panel wall arrangement (1), - inserting a new panel (7) into the gap (6), wherein the new panel (7) is provided with a first groove (10) and second groove (8),
- 10 - securing the new panel (7) to the structure wall element (3),
- wherein the step of securing the new panel (7) to the structure wall element (3) comprises the following steps:
- inserting a first bracket (29) into the first groove (10), and
- connecting the first bracket (29) with the retaining anchor (4), by
- providing a connector element (63) in the retaining anchor (4).

15

2. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to claim 1, wherein the second groove (8) is positioned on a second bracket (28) that is provided at the structure wall element (3), the second bracket (28) being located in a second area (26) of the gap (6),

- 20 wherein the step of securing the new panel (7) to the structure wall element (3) comprises the following steps:
- inserting a second bracket (28) into the second groove (8), and connecting the second bracket (28) with a retaining anchor (4), by
- providing a connector element (63) in the retaining anchor (4).

25

3. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to one claim 1 or claim 2, wherein

- a total of at least four retaining anchors (4) being provided in the structure wall element (3), two of the retaining anchors (4) being located in a first area (5) of a gap (6) in the
- 30 panel wall arrangement (1), at a horizontal distance from each other, and two of the retaining anchors (4) being located in a second area (26) of the gap (6), at a horizontal

distance from each other, further comprising the following steps:

- providing a connector element (63) in each retaining anchor (4), followed by providing an adjustment element (92) on each one of the connector elements (63), and inserting a new panel (7) into the gap (6), comprising the following steps:

- 5 - inserting two first brackets (29) into the first groove (10) of the new panel (7), at a horizontal distance from each other, and inserting two second brackets (28) into the second groove (8) of the new panel (7), at a horizontal distance from each other.

4. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a
10 structure wall element (3) according to one of claims 1 to 3, wherein the new panel (7) is provided with a second groove (8), with a first groove (10), wherein a safety wire (27) is provided in the second groove (8), the method further comprising the step of connecting the safety wire (27) with the structure wall element (3).

15 5. Method according to claim 4, wherein the step of connecting the safety wire (27) with the structure wall element (3) comprises connecting the safety wire (27) with a second bracket of another existing panel (2) of the panel wall arrangement (1).

20 6. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to claim 4 or claim 5, wherein the new panel (7) comprises a first side groove (12) at a first side (14) of the new panel (7) and a second side groove (13) at a second side (15) of the new panel (7), the safety wire (27) being provided in the first side groove (12) and/or in the second side groove (13).

25 7. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to one of claims 1 to 6, with the following steps:
- providing an adjustment element (92) on the connector element (63),
- inserting the connector element (63) into the first bracket (29) and/or into the second bracket (28),
30 - providing a holding element (90) on the connector element (63),

- tightening the holding element (90) or the holding elements (90), by using a racking key tool (94) that is inserted into a gap (6) between the new panel (7) and a neighboring existing panel (2).

- 5 8. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to claim 7, comprising a step of arranging the adjustment element (92) on the connector element (63) such that the outer surface (97) of the new panel (7) is flush with the outer surface (97) of a neighboring existing panel (2).

10

9. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to one of claims 1 to 6, with the following steps:

- providing a first lower bracket element (25) at the structure wall element (3), in the second area (26) of the gap (6),
- 15 - providing a second lower bracket (28) element at the first lower bracket element (25),
- adjusting the second lower bracket (28) element with respect to the first lower bracket element (25),
- securing the position of the second lower bracket (28) element with respect to the first lower bracket element (25).

20

10. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to claim 9, wherein the step of adjusting the second lower bracket (28) element with respect to the first lower bracket element (25) is done such that the outer surface (97) of the new panel (7) is flush with the outer surface (97) of a neighboring existing panel (2).

25

11. Method for replacing an existing panel (2) in a panel (2) wall arrangement (1) on a structure wall element (3) according to claim 9 or 10, the method comprising the following steps:

- 30 - providing a retaining anchor (4) in the structure wall element (3), the retaining anchor (4) being located in a first area (5) of a gap (6) in the panel (2) wall arrangement (1),

- inserting a new panel (7) into a gap (6) in the panel (2) wall arrangement (1), wherein the new panel (7) is provided with a second groove (8) at the bottom (9) of the new panel (7), with a first groove (10) at the top (11) of the new panel (7), and with a first side groove (12) at a first side (14) of the new panel (7), and with a second side groove (13) at a second side (15) of the new panel (7),
 - the second groove (8) being positioned on a second bracket (28) that is provided at the structure wall element (3), the second bracket (28) being located in a second area (26) of the gap (6),
 - inserting an first bracket (29) into the first groove (10), and
 - connecting the first bracket (29) with the retaining anchor (4),
- wherein the step of connecting the first bracket (29) with the retaining anchor (4) and/or the step of connecting the second bracket (28) with the retaining anchor (4) comprises the following steps:
- screwing a bolt into the retaining anchor (4),
 - putting a piece-A element on the bolt and secure it with a element against the structure wall element (3),
 - mounting a piece-B element to the piece-A element, using a second bolt-element element,
 - fixing the piece-A element with respect to the structure wall element (3),
 - fixing the piece-B element with respect to the piece-A element.

12. Method for replacing an existing panel (2) in a panel (2) wall arrangement (1) on a structure wall element (3) according to claim 11, comprising the step of adjusting the piece-A element with respect to the structure wall element (3) and the piece-B element with respect to the piece-A element such that the outer surface of the next existing stone wall panel is flush with the outer surface of the new stone wall panel.

13. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to one of claims 1 to 6,

wherein the step of providing a retaining anchor (4) for the first bracket (29) and/or the first bracket (29) comprises the steps of

- providing a first retaining element (70) in the retaining anchor (4),
- providing a coupler element (71) at the first retaining element (70),
- providing a second retaining element (72) in the coupler element (71).

- 5 14. Method according to claim 12, wherein the step of inserting a new panel (7) into a gap (6) in the panel wall arrangement (1) comprises a step of turning the second retaining element (72) such that a retaining pin (73) of the second retaining element (72) engages in a first groove (10) and/or in a second groove (11) of the new panel (7).
- 10 15. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to claim 13 or 14, wherein the steps of providing a coupler element (71) at the first retaining element (70) and providing a second retaining element (72) in the coupler element (71) comprises a step of adjusting the position of the second retaining element (72) in the coupler element (71) such that an outer surface
- 15 (97) of the new panel (7) is flush with the outer surface (97) of a neighboring existing panel (2).
16. Method for replacing an existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to one of claims 13 to 15, wherein the step of
- 20 connecting the first bracket (29) with the retaining anchor (4) comprises the following steps:
- providing a hole (76) into the structure wall element (3),
 - inserting the retaining anchor (4) into the hole (76),
 - screwing a retaining screw assembly (75) into the retaining anchor (4),
 - 25 -cutting the retaining screw assembly (75) in order to create a first retaining element (70) and a second retaining element (72) with a retaining pin (73),
 - screwing a coupler sleeve (71) on the first retaining element (70),
 - holding a threaded end of the second retaining element (72) near the coupler sleeve (71) and the threaded end of the first retaining element (70),
 - 30 -unscrewing the coupler sleeve (71) from the threaded end of the first retaining element (70) and onto the threaded end of the second retaining element (72) such that the

coupler sleeve (71) connects the first retaining element (70) with the second retaining element (72).

- 5 17. Method for replacing an existing panel (2) according to claim 16, wherein the step of connecting the second bracket (28) with the retaining anchor (4) comprises the following steps:
- providing a hole (76) into the structure wall element (3),
 - inserting the retaining anchor (4) into the hole (76),
 - screwing a first retaining element (70) into the retaining anchor (4),
 - 10 - screwing an adjustment element (92) on the first retaining element (70),
 - putting the new panel (7) with the second bracket (28) onto the first retaining element (70), such that it contacts the outer surface of the adjustment element (92)
 - screwing a holding element (90) onto the first retaining element (70), such that the
 - 15 element (90).

18. Method for replacing an existing panel (2) according to claims 16 or 17, wherein the holding element (90) is provided with an Allen key hole (76).

- 20 19. Method for replacing an existing panel (2) according to one of claims 16 to 18, wherein the second bracket (28) is used as a first bracket (29).

20. Method for replacing an existing panel (2) in a panel (2) wall arrangement (1) on a structure wall element (3), the method comprising the following steps:
- 25 - providing a retaining anchor (4) in the structure wall element (3), the retaining anchor (4) being located in a first area (5) of a gap (6) in the panel (2) wall arrangement (1),
 - inserting a new panel (7) into a gap (6) in the panel (2) wall arrangement (1), wherein the new panel (7) is provided with a second groove (8) and with a first groove (10) at the top (11) of the new panel (7),

- the second groove (8) being positioned on a second bracket (28) that is provided at the structure wall element (3), the second bracket (28) being located in a second area (26) of the gap (6),

- inserting an first bracket (29) into the first groove (10), and

5 - connecting the first bracket (29) with the retaining anchor (4).

21. Bracket fastener assembly with a connector element (63), with an adjustment element (92), with a first bracket (28) or with a second bracket (29) for a panel, and with a holding element (90) that comprises a roughened cylindrical surface for a form-locking
10 actuation.

22. Bracket fastener assembly according to claim 21, wherein the roughened cylindrical surface has a tooth height of larger than 0.1mm and smaller than 1mm.

15 23. Bracket fastener assembly according to claim 22, wherein the roughened cylindrical surface has a tooth height of larger than 0.1mm and smaller than 0.3mm.

24. Panel wall arrangement (1) on a structure wall element (3) with a plurality of panels, wherein a bracket fastener assembly according to one of claims 21 to 23 is provided for
20 securing a new panel (7) to the structure wall element (3).

25. Panel for replacing an existing panel (2) in a panel (2) wall arrangement (1) on a structure wall element (3), with at least one groove that comprises an outer flange (96) and an inner flange (95), at least a section of the outer flange (96) on the outer side of
25 the panel being longer than the inner flange (95) on the inner side of the panel.

26. Panel according to claim 25, wherein the length of the inner flange (95) is between 70% and 30% of the length of the outer flange (96).

30 27. Panel according to claim 26, wherein the length of the inner flange (95) is between 55% and 45% of the length of the outer flange (96).

28. Panel wall arrangement (1) on a structure wall element (3) (carrier wall, a structure wall, a façade stone, a pillar), with a plurality of existing panels and new panels, wherein at least one new panel (7) is provided with a second groove (8) at the bottom (9) of the new panel (7), with a first groove (10) at the top (11) of the new panel (7), with the second groove (8) being positioned on a second bracket (28) that is provided at the structure wall element (3) such that the second bracket (28) being located in a second area (26) of the gap (6) and with an first bracket (29) being positioned in the first groove (10) with the first bracket (29) being connected with the retaining anchor (4), wherein a safety wire (27) is provided in the second groove (8), wherein the safety wire (27) is connected with the structure wall element (3).

29. Panel wall arrangement (1) on a structure wall element (3) according to claim 28, wherein at least one new panel (7) is provided with a first side groove (12) at a first side (14) of the new panel (7), and with a second side groove (13) at a second side (15) of the new panel (7), wherein the safety wire (27) is provided in the first side groove (12) and in the second side groove (13).

30. Panel wall arrangement (1) according to claim 28 or claim 29, wherein the safety wire (27) is connected with a second bracket (28) of an existing panel (2).

31. Panel wall arrangement (1) according to one of claims 28 to 30, wherein the safety wire (27) forms a closed loop of a piece of wire with two open ends of the piece of wire being connected with each other.

25

32. Panel wall arrangement (1) according to one of claims 28 to 31, wherein the the safety wire (27) is provided within openings in the new panel (7) that connect the second groove (8) with the first side groove (12) and/or the second side groove (13) and/or within openings in the new panel (7) that connect the first groove (10) with the first side groove (12) and/or the second side groove (13).

30

33. Panel (7) for closing a gap (6) left by a missing existing panel (2) in a panel wall arrangement (1) on a structure wall element (3), the panel (7) being provided with a second groove (8) at the bottom (9) of the panel (7), with a first groove (10) at the top (11) of the panel (7), the second groove (8) being provided for being positioned on a second bracket (28) and the first groove (10) being provided for being positioned in a first bracket (29), wherein a channel for a placing a safety wire (27) is provided by the second groove (8).

34. Panel (7) for closing a gap (6) left by a missing existing panel (2) in a panel wall arrangement (1) on a structure wall element (3) according to claim 33, further comprising:

a first side groove (12) at a first side (14) of the panel (7), and with a second side groove (13) at a second side (15) of the panel (7),

wherein the channel for a placing a safety wire (27) is provided by the second groove (8), by the first side groove (12), and by the second side groove (13), and by openings that connect the second groove (8) with the first side groove (12) and the second side groove (13) and/or by openings that connect the first groove (10) with the first side groove (12) and the second side groove (13).