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(54) **RETROFIT BRICK TIE**

(57) A retrofit brick tie comprises an elongate member having a first end and a second end. The first end includes a first aperture and a second aperture. Each of the first and second apertures is configured and arranged to receive a fastener. The second end includes a first elongated opening and a second elongated opening. Each of the first and second elongated openings is configured and arranged to receive an adhesive. A method of installing the retrofit brick tie comprises creating a bore in an interior surface of a brick structure, filling the bore with an adhesive, and inserting the second end into the bore. A stud is positioned proximate the interior surface, and a fastener is inserted through each of the first and second apertures and into the stud thereby securing the stud to the brick structure.

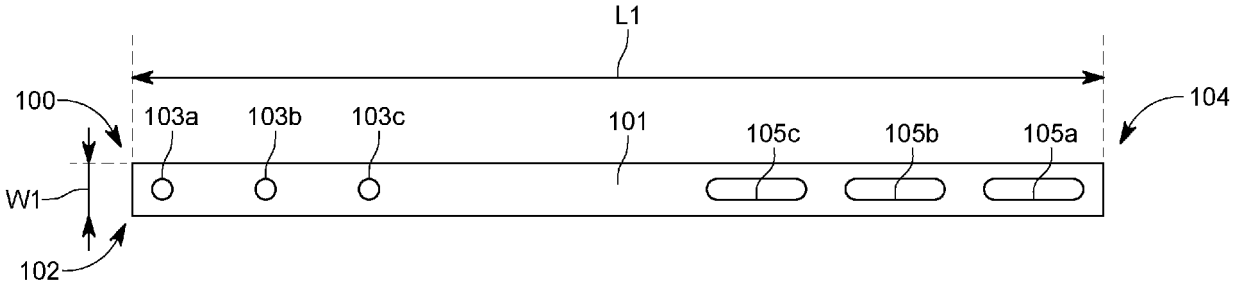

FIG. 1

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Description

BACKGROUND

[0001] When buildings deteriorate because of aging and/or are damaged by water, including flooding, the building materials (e.g., exterior walls) can become damaged and contaminated with dirt, debris, and various types of microorganisms, including bacteria and fungi (e.g., mold). If materials become damaged beyond repair or cannot be adequately cleaned and disinfected, they are typically replaced. For buildings including brick foundations or veneer, it can be difficult or impossible to secure replacement building materials using typical construction procedures.

[0002] For the reasons stated above and for other reasons stated below, which will become apparent to those skilled in the art upon reading and understanding the present specification, there is a need in the art for retrofit brick ties.

SUMMARY

[0003] The above-mentioned problems associated with prior devices are addressed by embodiments of the disclosure and will be understood by reading and understanding the present specification. The following summary is made by way of example and not by way of limitation. It is merely provided to aid in understanding some of the aspects of the invention.

[0004] In one embodiment, a retrofit brick tie includes an elongate member having a first end and a second end. The first end includes a first aperture and a second aperture. Each of the first and second apertures is configured and arranged to receive a fastener. The second end includes a first elongated opening and a second elongated opening. Each of the first and second elongated openings is configured and arranged to receive an adhesive.

[0005] In one embodiment, a method of installing a retrofit brick tie includes obtaining a retrofit brick tie, which includes an elongate member having a first end and a second end. The first end includes a first aperture and a second aperture. Each of the first and second apertures is configured and arranged to receive a fastener. The second end includes a first elongated opening and a second elongated opening. Each of the first and second elongated openings is configured and arranged to receive an adhesive. A bore is created in an interior surface of a brick structure, the bore is filled with an adhesive, and the second end is inserted into the bore so that the adhesive fills in the elongated openings and the first end extends outward from the interior surface. The adhesive is allowed to cure. A stud is positioned proximate the interior surface, and a fastener is inserted through each of the first and second apertures and into the stud thereby securing the stud to the brick structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The accompanying drawings are included to provide a further understanding of embodiments and are incorporated in and constitute a part of this specification. The drawings illustrate embodiments and together with the description serve to explain principles of embodiments. Other embodiments and many of the intended advantages of embodiments will be readily appreciated as they become better understood by reference to the following detailed description. In accordance with common practice, the various described features are not drawn to scale but are drawn to emphasize specific features relevant to the present disclosure. Reference characters denote like elements throughout the Figures and the text.

FIG. 1 is a side view of an embodiment retrofit brick tie constructed in accordance with the principles of the present invention;

FIG. 2 is a side view of another embodiment retrofit brick tie constructed in accordance with the principles of the present invention;

FIG. 3 is a top view of the retrofit brick tie shown in FIG. 2; and

FIG. 4 is a schematic partial cross section side view of a building structure to which the retrofit brick tie shown in FIG. 2 is installed.

DETAILED DESCRIPTION

[0007] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration embodiments in which the disclosure may be practiced. In this regard, directional terminology, such as "top," "bottom," "front," "back," "leading," "trailing," etc., is used with reference to the orientation of the Figure(s) being described. Because components of embodiments can be positioned in a number of different orientations, the directional terminology is used for purposes of illustration and is in no way limiting. It is to be understood that other embodiments may be utilized and structural or logical changes may be made without departing from the scope of the present invention. The following detailed description, therefore, is not to be taken in a limiting sense, and the scope of the present invention is defined by the appended claims.

[0008] It is to be understood that other embodiments may be utilized and mechanical changes may be made without departing from the spirit and scope of the present disclosure. The following detailed description is, therefore, not to be taken in a limiting sense.

[0009] Embodiments of the disclosure generally provide a retrofit brick tie comprising an elongate member

having a first end and a second end. The first end includes a first aperture and a second aperture, and each of the first and second apertures is configured and arranged to receive a fastener. The second end includes a first elongated opening and a second elongated opening, and each of the first and second elongated openings is configured and arranged to receive an adhesive. The second end is configured and arranged to be inserted into an aperture in an interior surface of a brick structure and the first end is configured and arranged to be secured to a stud with the fasteners when the stud is positioned proximate the interior surface.

[0010] In one embodiment, illustrated in FIG. 1, a brick tie 100 comprises an elongate member 101 having a first end 102 and a second end 104. The first end 102 includes apertures 103a, 103b, and 103c, and the second end 104 includes elongated openings 105a, 105b, and 105c. Although three apertures and three elongated openings are illustrated, it is recognized that any suitable number of apertures and elongated openings can be used with any suitable spacing. Preferably, at least two apertures and elongated openings are used. The elongate member 101 is preferably made of 22 gauge stainless steel 304-2b and has a length L1 of approximately 7 inches long and a width W1 of approximately 3/8 inch, however, any suitable material and dimensions can be used.

[0011] In this embodiment, the apertures 103a, 103b, and 103c in the first end 102 are round and the elongated openings 105a, 105b, and 105c in the second end 104 are oval slots. Preferably, the round apertures are 3/16 inch in diameter and are spaced approximately 3/4 inch apart from center. Preferably, the first aperture 103a is approximately 3/16 inch from an end surface of the first end 102. Preferably, the oval slots are approximately 3/16 inch by approximately 3/4 inch and are spaced approximately 1/4 inch apart. Preferably, the first elongated opening 105a is approximately 3/16 inch from an end surface of the second end 104. Preferably, the third aperture 103c and the third elongated opening 105c are approximately 2 3/8 inches apart forming a middle portion of the elongate member 101. It is recognized that any suitable dimensions can be used.

[0012] In one embodiment, illustrated in FIGS. 2 and 3, a brick tie 200 comprises an elongate member 201 having a first end 202 and a second end 204. The first end 202 includes apertures 203a, 203b, and 203c, and the second end 204 includes elongated openings 205a, 205b, and 205c. Although three apertures and three elongated openings are illustrated, it is recognized that any suitable number of apertures and elongated openings can be used with any suitable spacing. Preferably, at least two apertures and elongated openings are used. The elongate member 201 is preferably made of 22 gauge stainless steel 304-2b and is approximately 7 inches long and approximately 3/8 inch wide. Optionally, the elongated openings 205a, 205b, and 205c can include tabs or barbs extending outward from the base. In the base portions including optional tabs or barbs, the brick tie is preferably approximately 1/4 inch thick with the barbs protruding from the base. The barbs are described below. Again, any suitable dimensions can be used.

[0013] In this embodiment, the apertures in the first ends of the brick ties 100 and 200 are similarly configured. The elongated openings 205a, 205b, and 205c in the second end 204 are preferably C-shaped cuts forming the elongated openings and forming tabs or barbs extending outward from one or both sides of the second end 204. Other suitable shaped cuts can be used. Fig. 3 illustrates the barbs extending outward from one side, however, each barb can extend outward from either side. Therefore, all of the barbs can extend outward from one side or one or more of the barbs can extend outward from one side while the other barb(s) can extend outward from the other side. Preferably, the C-shaped cuts are approximately 3/16 inch by approximately 1/2 inch and are spaced approximately 1/2 inch apart. Preferably, the first elongated opening 205a is approximately 3/8 inch from an end surface of the second end 204. Preferably, the third aperture 203c and the third elongated opening 205c are approximately 2 7/16 inches apart forming a middle portion of the elongate member 201. It is recognized that any suitable dimensions can be used.

[0014] Generally, this is a retrofit brick tie that is installed from the inside of an existing building to the back side (interior surface) of the existing masonry veneer. The second end is configured and arranged to be inserted into an aperture or bore in an interior surface of a brick structure, and the first end is configured and arranged to be secured to a stud with fasteners when the stud is positioned proximate the interior surface. The brick structure includes at least first and second bricks interconnected with mortar, and the aperture or bore could be in either one of the bricks or the mortar.

[0015] The brick tie 200 is shown installed on an example building structure 300 to interconnect a brick structure and a stud 305 in FIG. 4. The brick structure includes at least first and second bricks (bricks 301a, 301b, 301c, and 301d are shown) interconnected with mortar (mortars 302a, 302b, and 302c are shown), and the aperture or bore 304 could be in either one of the bricks or the mortar. In this example, the bore 304 is in the mortar 302b, and the bore 304 is configured and arranged to receive the adhesive 303, which can also be received in voids in the bricks. Preferably, the bricks are approximately 2 1/4 inches in height and approximately 3 5/8 inches deep and the mortar is approximately 3/8 inch thick between the bricks. The stud 305 is preferably made of 2 x 4 or 2 x 6 steel or wood material.

[0016] To install an embodiment retrofit brick tie, for example brick tie 200 installed on an example building structure 300 as illustrated in FIG. 4, a bore 304 is made in an interior surface of the brick structure. Although the bore 304 is shown in the mortar 302b, it is recognized that the bore 304 could also be made in the brick. Preferably, a 3/8 inch hole is drilled approximately 3 inches deep into the mortar joint proximate the preferred stud

location. Any dust and/or debris is cleaned from the bore 304 and bore opening 304a. An adhesive 303 is positioned in the bore 304. Preferably, epoxy or any other suitable adhesive is used. The second end 204 of the brick tie 200 is inserted into the adhesive filled bore 304. The elongated openings 205a, 205b, and 205c, and the optional barbs 206a, 206b, and 206c, are configured and arranged to receive and engage the adhesive 303. The elongated openings greatly improve the holding power of the anchoring adhesive by providing a larger voids for the adhesive to occupy. The optional barbs provide additional engagement with the adhesive. After the adhesive 303 is cured, the first end 202 of the brick tie 200 is secured to the stud 305 positioned proximate the interior surface. Fasteners 306a, 306b, and 306c, for example screws, preferably 1 1/4 inch screws, are inserted through the apertures 203a, 203b, and 203c and into the stud 305 thereby securing the stud 305 to the brick structure. Brick ties are preferably installed every 16 inches vertically along the studs (every sixth course of bricks).

[0017] Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or equivalent implementations may be substituted for the specific embodiments shown and described without departing from the scope of the present invention. This application is intended to cover any adaptations or variations of the specific embodiments discussed herein. Therefore, it is intended that this invention be limited only by the claims and the equivalents thereof.

Claims

1. A retrofit brick tie, comprising:

an elongate member having a first end and a second end;
the first end including a first aperture and a second aperture, each of the first and second apertures configured and arranged to receive a fastener; and
the second end including a first elongated opening and a second elongated opening, each of the first and second elongated openings configured and arranged to receive an adhesive.

2. The retrofit brick tie of claim 1, wherein the first and second openings are oval slots.

3. The retrofit brick tie of claim 2, wherein the slots are approximately 3/16 inch by approximately 3/4 inch and spaced approximately 1/4 inch apart.

4. The retrofit brick tie of claim 1, wherein the first elongated opening is approximately 3/16 inch from an end surface of the second end.

5. The retrofit brick tie of claim 1, wherein the first and second elongated openings are C-shaped cuts forming the first and second elongated openings and barbs extending outward from one or both sides of the second end, the first and second elongated openings and the barbs configured and arranged to engage the adhesive.

6. The retrofit brick tie of claim 5, wherein the C-shaped cuts are approximately 3/16 inch by approximately 1/2 inch and spaced approximately 1/2 inch apart.

7. The retrofit brick tie of claim 1, wherein the second end is configured and arranged to be inserted into an aperture in an interior surface of a brick structure and the first end is configured and arranged to be secured to a stud with the fasteners when the stud is positioned proximate the interior surface.

8. The retrofit brick tie of claim 1, wherein the elongate member is approximately 7 inches long and approximately 3/8 inch wide.

9. A method of installing a retrofit brick tie, comprising:

obtaining a retrofit brick tie comprising an elongate member having a first end and a second end, the first end including a first aperture and a second aperture, each of the first and second apertures configured and arranged to receive a fastener, the second end including a first elongated opening and a second elongated opening, each of the first and second elongated openings configured and arranged to receive an adhesive;
creating a bore in an interior surface of a brick structure;
filling the bore with an adhesive;
inserting the second end into the bore so that the adhesive fills in the elongated openings and the first end extends outward from the interior surface;
allowing the adhesive to cure;
positioning a stud proximate the interior surface; and
inserting a fastener through each of the first and second apertures and into the stud thereby securing the stud to the brick structure.

10. The method of claim 9, wherein the brick structure includes mortar interconnecting a first brick and a second brick, the bore being created in the mortar.

11. The method of claim 9, wherein the adhesive is epoxy.

12. The method of claim 9, wherein the first and second openings are C-shaped cuts forming the first and second elongated openings and barbs, the first and

second elongated openings and the barbs configured and arranged to engage the adhesive, further comprising ensuring the barbs are extending outward from the second end prior to inserting the second end.

13. The method of claim 9, wherein the fastener is a screw.

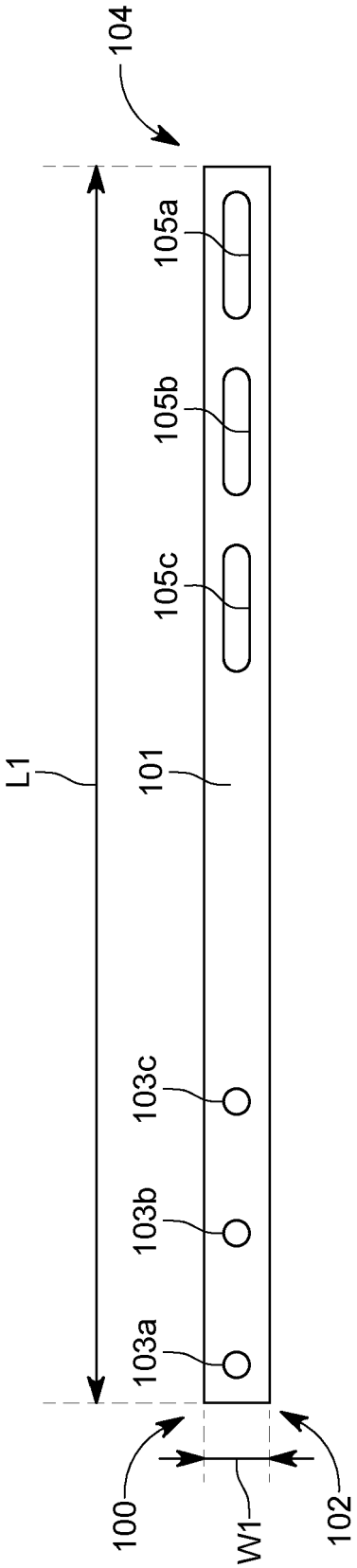


FIG. 1

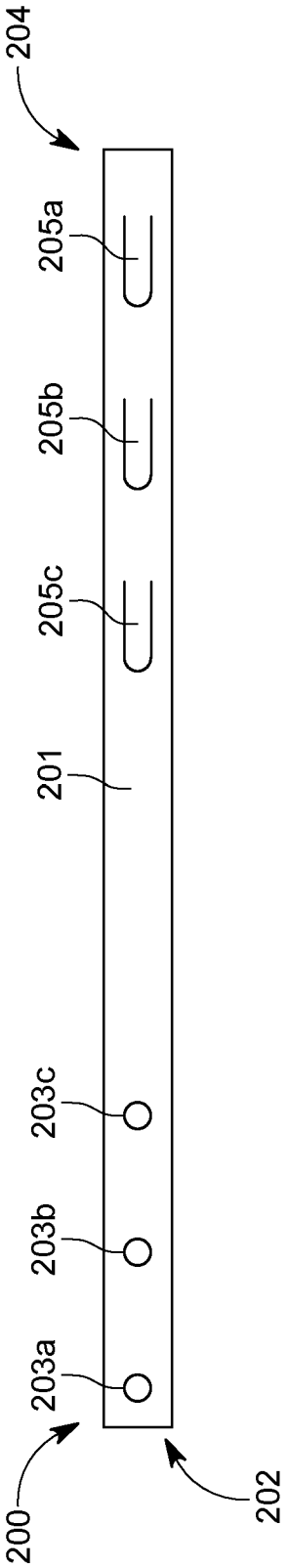
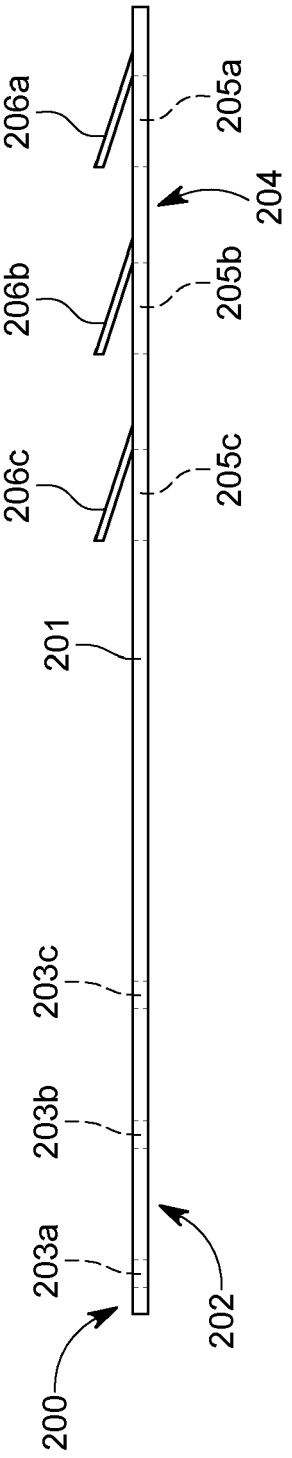

204
205a
205b
205c
201
203c
203b
203a
200
202

FIG. 2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205a
204
206b
205b
206c
205c
201
203c
203b
203a
202
200

FIG. 3

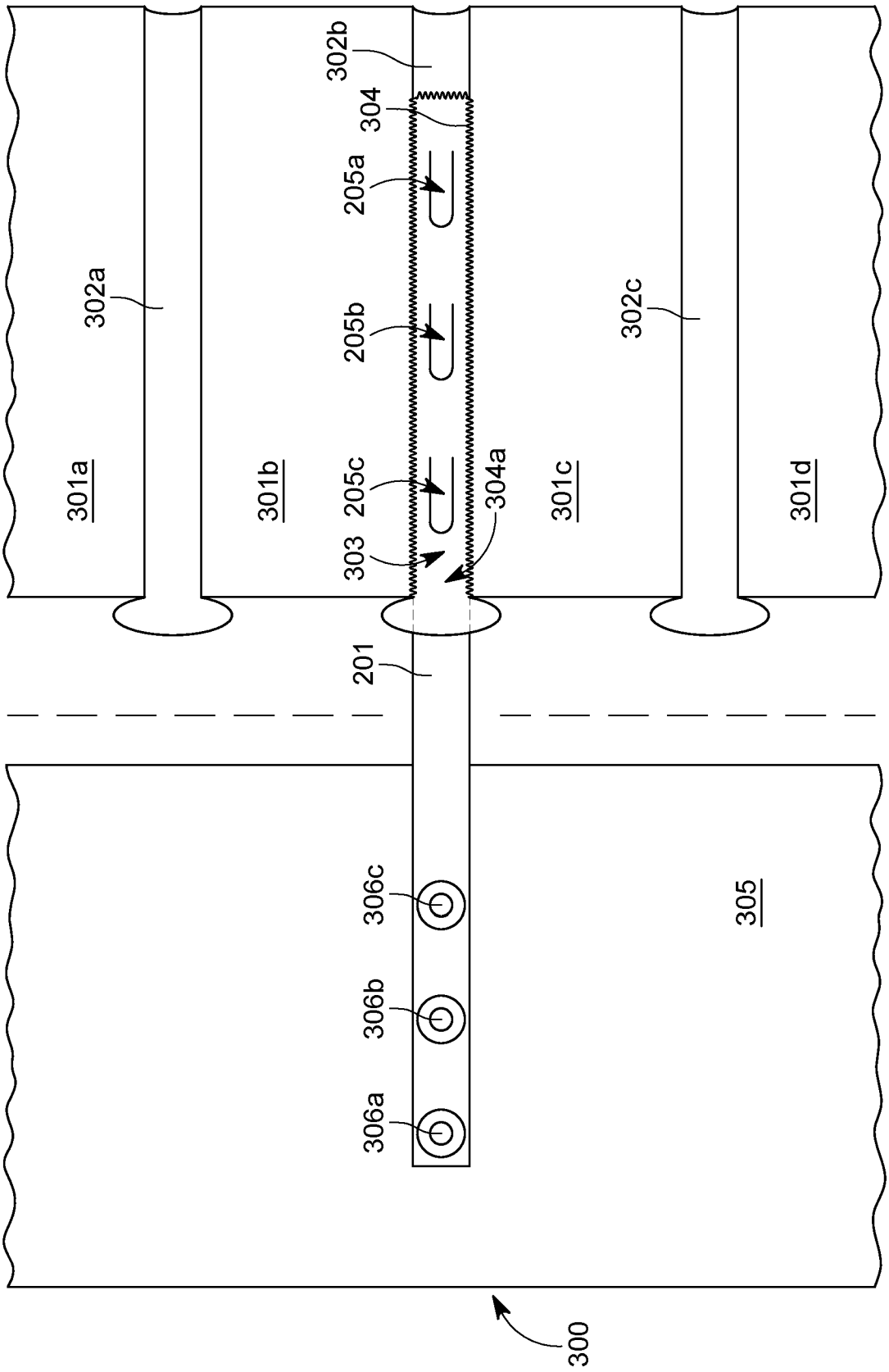
302b
304
205a
205b
205c
303
304a
302a
302c
301a
301b
301c
301d
201
306c
306b
306a
305
300

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 22 19 6637

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y A	US 2019/127971 A1 (STAUFFER TIMOTHY M [US] ET AL) 2 May 2019 (2019-05-02) * paragraph [0060]; figures 1,9 *	1-4,6-8 5 9-13	INV. E04B1/41
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A	US 2010/212249 A1 (PETTINGALE ALAN [US]) 26 August 2010 (2010-08-26) * paragraph [0023]; figures 2-4 *	9-13	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 February 2023	Topcuoglu, Sadik Cem

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 22 19 6637

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13-02-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2019127971 A1	02-05-2019	NONE	
GB 2263291 A	21-07-1993	NONE	
US 2010212249 A1	26-08-2010	NONE	

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82