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AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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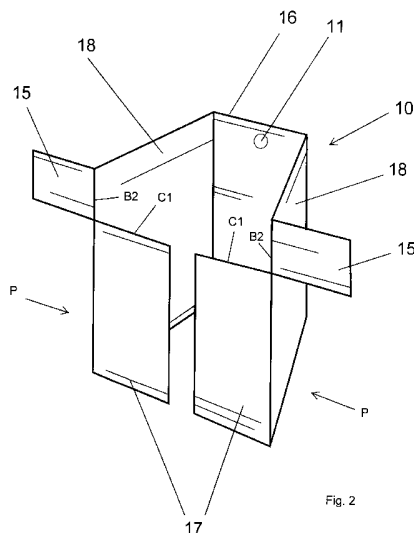
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(54) Title: CLIPS FOR THIN BRICK WALL SYSTEM



(57) Abstract: A decorative wall system comprises a supporting wall, a thin brick element with a mortise formed therein and a dovetail tenon clip with fastening means for insertion and retention in the mortise whereby the brick element is attached to the supporting wall. The dovetail tenon clip has a longitudinal space to enable the sidewalls to be pressed inwardly to collapse the space.



CLIPS FOR THIN BRICK WALL SYSTEM

Field of the Invention

The present invention relates to thin brick decorative wall systems and to specialized tenon clips for fastening the thin brick elements to a load
5 supporting wall or structure.

Background of the Invention

Thin brick products are available in the marketplace. Typically, a regular brick is split longitudinally and the front facing portion is used. The remaining or back portion is discarded. When installed, an attractive natural
10 brick appearance is presented. However, commercialization of this decorative wall facing option is slow in acceptance in part because of an inability to easily and inexpensively attach the facing brick elements to a vertical wall structure

Typically in the art, thin stone or thin brick wall systems are installed by the so-called "lick and stick" method, which involves the use of epoxy
15 adhesive to secure the thin stone or thin brick to plywood or OSB wall cladding, which involves the use of metal lath with a scratch coat of Portland mortar. Such an adhered thin stone or thin brick system is inherently less secure since improper application of the adhesive can lead to stones or bricks separating from the wall, which is both a nuisance and a safety problem.
20 Such adhered thin stone or thin brick systems are typically only used in lower floor applications of residential and commercial buildings as there is a bias

against their use on multi-floor buildings. Further, the adhered thin stone or thin brick system is not used in conjunction with other wall elements such as drainage board and weather-resistant wrap. Accordingly, thin stone or thin brick products have in the main been used primarily in commercial building applications.

Various bracket or clip systems have been developed to affix decorative veneer panels made to look like brick or stone to a vertical structural wall. Although useful in particular cases, such systems lack versatility and simplicity, requiring brackets or clips with complicated structures and/or several separate components. Such brackets or clips are difficult to secure to structural walls and require time-consuming alignment of panels. There remains a need in the art for a more versatile, secure and mechanically stronger thin stone or thin brick wall system that is less costly, easier and faster to install and requires less skilled labor.

Summary of Invention

According to one aspect of the invention, a decorative wall system comprises a supporting wall, a thin brick element with a mortise formed therein and a tenon clip having fastening means for insertion and retention in the mortise whereby the brick element is attached to the supporting wall.

According to another aspect of the invention, the tenon clip has a quadrilateral cross section comprising a fastening side having a first width, a second side having a width greater than the width of the first fastening side

and sidewalls. The mortise has a cross section which is complementary to the tenon clip cross section and is sized to receive and retain the tenon clip therein.

According to yet another aspect of the invention, the tenon and mortise
5 cross sections are dovetail shaped and the second side has a longitudinal space there between to enable the sidewalls to be pressed inwardly to collapse the space.

According to yet another aspect of the invention, the tenon clip has limiting means for engagement against the top surface of the brick element to
10 thereby limit relative movement therebetween. The limiting means may consist of an integrally formed outwardly extending tab on the tenon clip.

According to yet another aspect of the invention, the fastening side has an outwardly protruding collapsible tab to permit selective engagement of the tenon clip against the supporting wall which is a trim feature which controls
15 the space between the rear of the tenon clip and the supporting wall.

According to yet another aspect of the invention, a thin brick element having a decorative face, a top surface, a bottom surface, a thickness and a mortise aligned vertically and extending between the top and said bottom surfaces.

Brief Description of the Drawings

In order that the invention may be more clearly understood, embodiments thereof will now be described in detail by way of example, with reference to the accompanying drawings, in which:

5 **Fig. 1A** is a perspective view of a thin brick facing element used in a decorative wall system of the present invention;

Fig. 1B is a perspective view of a regular brick showing how it may be split into two thin brick elements;

Fig. 1C is a cross sectional view of the dovetail shaped mortise
10 aperture in Fig 1B;

Fig. 1D is a side view of the thin brick element;

Fig. 2 is a perspective view of an embodiment of the tenon clip;

Fig. 3 is a perspective view of another embodiment of the tenon clip;

Fig. 4 is a perspective view of yet another embodiment of the tenon
15 clip;

Fig. 5 is a top view of the tenon clip in Fig. 2;

Fig. 6 is a side view of the tenon clip in Fig. 2;

Fig. 7 is a front view of the tenon clip in Fig. 2.

Description of Preferred Embodiments

Referring to Figs. 1A – 1D, a thin brick element **1** comprises a front face **2**, rear face **3**, top face **4**, bottom face **5** and two side faces **6**. The thin brick element **1** is formed by splitting a standard brick longitudinally along line **AA** during the manufacturing process. The standard brick is manufactured with vertical dovetail shaped apertures (three apertures shown) along its centre as shown in Fig. 1A and 1C. The splitting of the standard brick will leave a set of dovetail shaped aperture mortises along rear face **3** of the thin brick element **1**. As well, it is preferable that both faces **a** and **b** of the thin brick element **1** are available for use so that the splitting of the regular brick will yield 2 thin brick elements which makes each thin brick element less costly.

A dovetail shaped mortise groove or slot **7** on the rear face **3** of a thin brick element **1** extends vertically along the entire brick height **BH** of thin brick element **1**. The thin brick element **1** has the same dimension as a traditional brick with the exception of being only one half the traditional brick depth **BD**. In one embodiment the thin brick element **1**, by way of example only, is approximately 7.625 inches long by 1.75 inches deep by 2.25 inches in height. The vertical dovetail shaped mortise **7** has a depth of approximately 0.75 inches with an opening width of between 0.75-1 inch and a bottom width of between 1-1.5 inches. The invention is not restricted to any particular brick or mortise size.

Referring to Figs. 2 - 4, a dovetail tenon clip **10** is used for attaching the thin brick element **1** to plywood, drainage board or other vertical supporting structure. A dovetail joint is created by inserting the dovetail tenon clip **10** into the dovetail shaped mortise **7** which is securely retained therein.

- 5 The dovetail tenon clip **10** acts as a flaring tenon and has a generally trapezoidal cross sectional shape. The tenon clip has a quadrilateral walled structure shape having opposing unequal parallel sides **16** and **17** to define the dovetail therebetween. The tenon clip has a shorter fastening side **16** having a first width, adjacent flared sides **18** having a length that flare
10 outwardly, and split longer side portions **17** that are connected at the vertices and complete the trapezoid leaving an open space therebetween.

- The space between the longer side **17** portions is provided to allow for a spring action to allow for easy insertion of the dovetail tenon clip **10** into the dovetail shaped mortise **7**. The installer is thus able to apply finger pressure
15 P on opposite sides of the tenon clip **10** to close the tenon clip enabling it to fit into the dovetail mortise **7** of the brick wherein it expands outwardly to fit snugly in the mortise and be retained and secured therein. The shorter fastening side **16** has an aperture **11** at the top for accepting a screw or nail or any other suitable fastening means, to fasten and secure the tenon clip **10** to
20 the supporting structure. In this fashion the thin brick element **1** is firmly secured to the supporting structure. When the tenon clip **10** is installed into the thin brick element **1**, the shorter fastening side **16** is preferably flush with the rear face **3** of the thin brick element **1**.

Referring to Fig 3, the tenon clip **10** has a top surface edge **21** which may be aligned flush with the top surface of the thin brick element **1**. As such, the next upper row of bricks will rest directly on top of the bottom row in a dry stack arrangement with no space therebetween. To automate this type of
5 installation, an engagement surface may be provided by way of outwardly extending tab **22** shown in Fig 4. The tab **22** will automatically reference the tenon clip **10** with the top surface of the thin brick element **1** by limiting relative movement between the tenon clip **10** and brick element **1** at that point.

Alternatively, the top surface edge of the tenon clip **10** may be raised
10 with reference to the top surface of the thin brick element **1** wherein the top row of bricks will rest directly on top of the top surface of the tenon clip **10** creating a mortar space therebetween.

In another embodiment of the tenon clip **10**, automatic spacing for mortar between vertically adjacent bricks is provided between the thin brick
15 elements as shown in Fig 2. The tenon clip **10** may be installed wherein a top portion thereof extends beyond the top surface of the brick to provide leveling, seating and importantly, define spacing distance between vertically adjacent bricks. Referring to Figs 5-7, the top portion of the split longer side **17** may be preferably cut away at a defined height **H** along line **C1** to form a pair of wings
20 or tabs **15** which when folded outwardly along line **B2** engage the top surface of the thin brick element **1** when the tenon clip **10** is inserted into the dovetail mortise **7** to limit the relative movement between the tenon clip **10** and brick element and create automatic leveling and spacing between vertically

adjacent thin brick elements **1**. The entire top surface of the tenon clip **10** functions to provide a raised ledge to act as spacing and support for the next overlying brick.

Referring to Figs 2 - 4, it is to be noted that an aperture **11** is located in the fastening side portion of the tenon clip **10** and permits direct horizontal access to the aperture with a fastener above the brick. The space created between the bricks is filled with mortar which additionally will flow into the dovetail joint to help secure the tenon clip **10** therein to the brick.

Referring to Fig 4, for a dry stack installation where spacing is not desired, the ledge or tab section may be folded down or eliminated for a flush fit as shown in Fig 3. Only the fastening side **16** of the tenon clip **10** will have a raised portion above the surface of the brick to allow installation via the aperture **11**. Every thin brick element **1** is individually fastened to the wall structure with a tenon clip **10** and fastener passing through aperture **11**. The dovetail joint functions to prevent the thin brick element **1** from pulling off the tenon clip **10** and off the vertical wall supporting structure.

A starter strip (not shown) is utilized to support the thin brick elements from below, from above or from one side. Starter strips may be straight or curved. Curved starter strips may be used to span archways and the like.

The starter strip has a support flange, a base flange depending from the support flange, preferably at a right angle, and a linking flange depending from the base flange, preferably at a right angle and preferably depending in

the same direction as the support flange. Preferably, the support flange of the starter strip has one or more apertures, preferably two or more apertures, for accepting fastening means for fastening the starter strip to the structural wall. The linking flange is housed within the groove on the edge of the facing
5 element. The linking flange preferably does not bottom-out in the groove. Preferably the base flange of the starter strip has one or more drainage holes for permitting moisture to escape from the behind the vertical wall structure.

The starter strip has a length long enough to span two or more thin brick elements. The starter strip has a length preferably from about 3 to 12
10 feet, more preferably about 4 or about 8 feet.

In one embodiment, the tenon clip **10** can be made by bending and cutting one single piece of metal. In one embodiment, a piece of metal with dimensions 4.25" by 2.25" can be used by way of example only. Referring to Fig 7, bend lines at **B1** form the shorter fastening side **16** (using an interior
15 angle greater than 90 degrees). Bend lines B2 form the connecting sides **18** and split longer side **17** (bent at an interior angle of 180 degrees minus the bend angle at B1 so that the **16** and **17** are parallel). If spacing is desired, the wings **15** are made by cutting along cut line **C1** from the outside edge to **B2** then folded outwardly at as shown in Fig. 2. The wings can optionally be
20 shortened to any desired length.

All common and custom bond laying patterns may be created using this system. In addition, the thin brick element and tenon clips can be

installed in both a vertical and a horizontal fashion to the walls to create row-locks, headers and soldier patterns.

In one embodiment, the tenon clip **10** has a preferred depth of 2.25 inches to run the entire brick height. The lip portion above the brick is
5 approximately 0.375 inches. The fastening side **16** of the tenon clip **10** is approximately 0.75 inches, the connecting sides **18** are approximately 1 inch each and the opposing brick side **17** is composed of two sections that extend from the connecting sides **18** of approximately 0.75 inches each with a spacing of approximately 0.25 inches in between.

10 The tenon clip offers versatility during installation. The installer may manipulate the tenon clip in situ in the thin brick element as required to vertically adjust the tenon clip. This is done by urging the tenon clip up or down with reference to the brick to thereby increase or decrease the spacing between vertically adjacent rows.

15 The tenon clip may also be shimmed with reference to the rear wall surface selectively by leaving a space between the rear of the tenon clip. In this way the thin brick element may be incrementally positioned outwardly or inwardly from the wall as required. An automatic shim feature may be provided at the rear of the tenon clip such a raised flexible indent portion or
20 tab. As such when the tenon clip is being secured to the wall, the installer can either attach the tenon clip flush with the wall by overriding the biasing tab or incrementally depressing the tab leaving space as required. Optionally, the tenon clip may be inserted in the bottom of the brick for larger installations

to prevent outwardly pivoting of the thin brick element and counter suction forces on the wall. For dry stack installation a heavier gauge may be used for the tenon clip to compensate for the lack of mortar between the adjacent vertical rows. The heavier gauge offers greater strength to compensate for
5 the absence of mortar. As well, a plurality of tenon clips may be used to attach a single thin brick element.

Other advantages which are inherent to the structure are obvious to one skilled in the art. The embodiments are described herein illustratively and are not meant to limit the scope of the invention as claimed. Variations of the
10 foregoing embodiments will be evident to a person of ordinary skill and are intended by the inventor to be encompassed by the following claims.

Claims

1. A decorative wall system comprising:

5 a supporting wall;

a thin brick element having a decorative face, a top surface, a bottom surface, a thickness and a mortise formed therein; and

10 a tenon clip having fastening means for insertion and retention within said mortise whereby said brick element is attached to said supporting wall by said fastening means.

2. The decorative wall system of claim 1, wherein said tenon clip has a quadrilateral cross section comprising a first fastening side having a width, a second side having a width greater than the width of said first fastening side and sidewalls whereby all said sides are connected at the vertices;

wherein said mortise has a cross section complementary to said tenon clip cross section and is sized to receive and retain said tenon clip therein.

3. The decorative wall system of claim 2, wherein said tenon and mortise cross sections are dovetail shaped.

4. The decorative wall system of claim 3, wherein said second side consists of two adjacent portions with a space therebetween and whereby said sidewalls may be pressed inwardly to collapse said space.
- 5 5. The decorative wall system of claim 4, wherein said tenon clip has limiting means for engagement against the top surface of the brick element to limit relative movement therebetween.
6. The decorative wall system of claim 5, wherein said limiting means is a
10 tab formed integrally with said tenon clip extending outwardly from said tenon clip.
7. The decorative wall system of claim 6, wherein said tab has a vertical height above said top surface.
- 15 8. The decorative wall system of claim 7, wherein said mortise is vertically extending between said top and bottom surfaces.
9. The decorative wall system of claim 8, wherein said fastening side has
20 an outwardly protruding collapsible shim-tab for selective engagement against said supporting wall.
10. A tenon clip for affixing brick elements to a supporting wall surface, said tenon clip having a quadrilateral cross section comprising a first fastening

side having a width, a second side having a width greater than the width of said first fastening side and sidewalls whereby all said sides are connected at the vertices;

5 wherein said fastening side has aperture means for fastening the tenon clip to the supporting wall surface.

11. A thin brick element having a decorative face, a top surface, a bottom surface, a thickness and a mortise aligned vertically and extending between
10 said top and bottom surfaces.

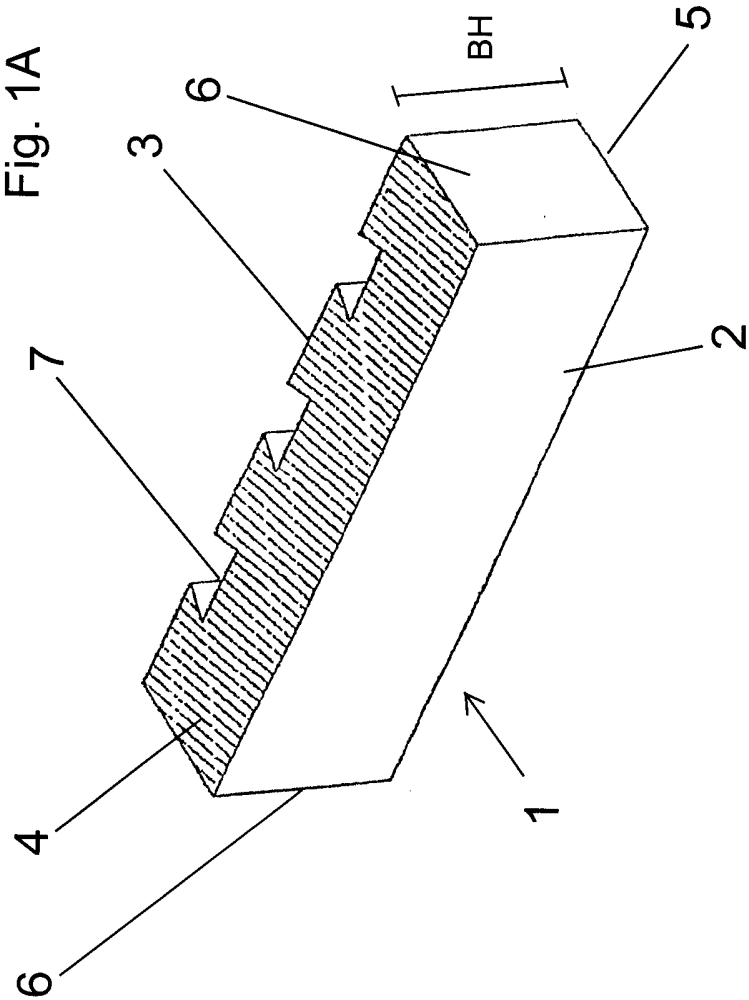


Fig. 1B

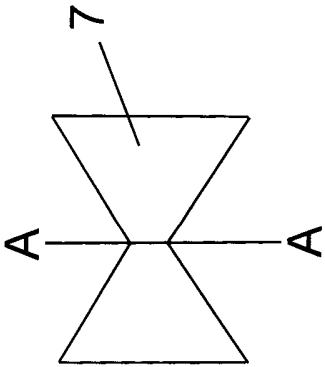
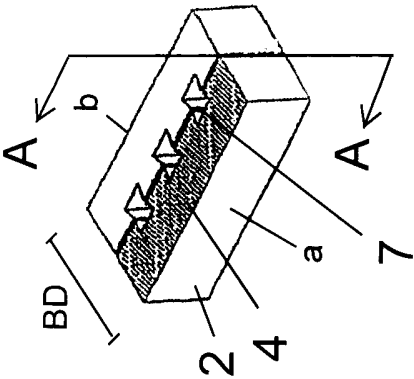


Fig. 1C

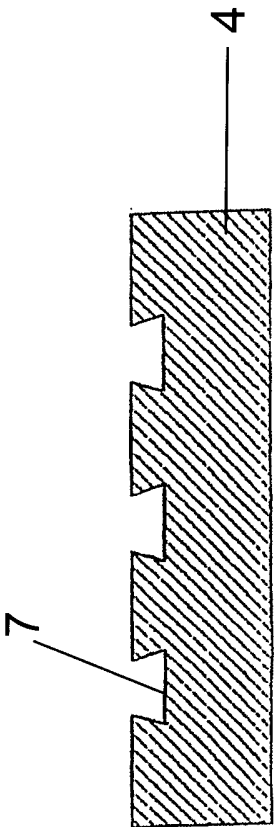


Fig. 1D

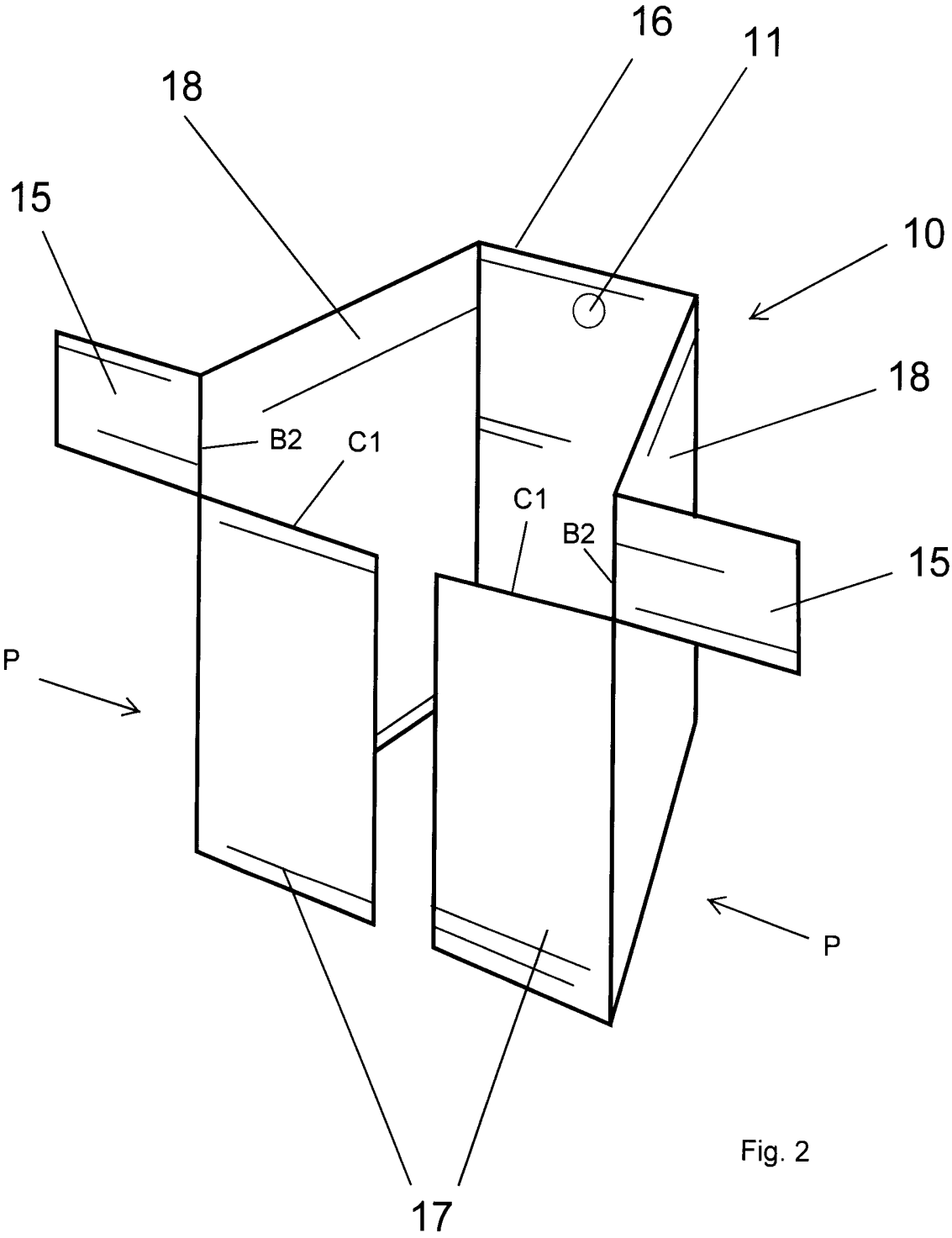


Fig. 2

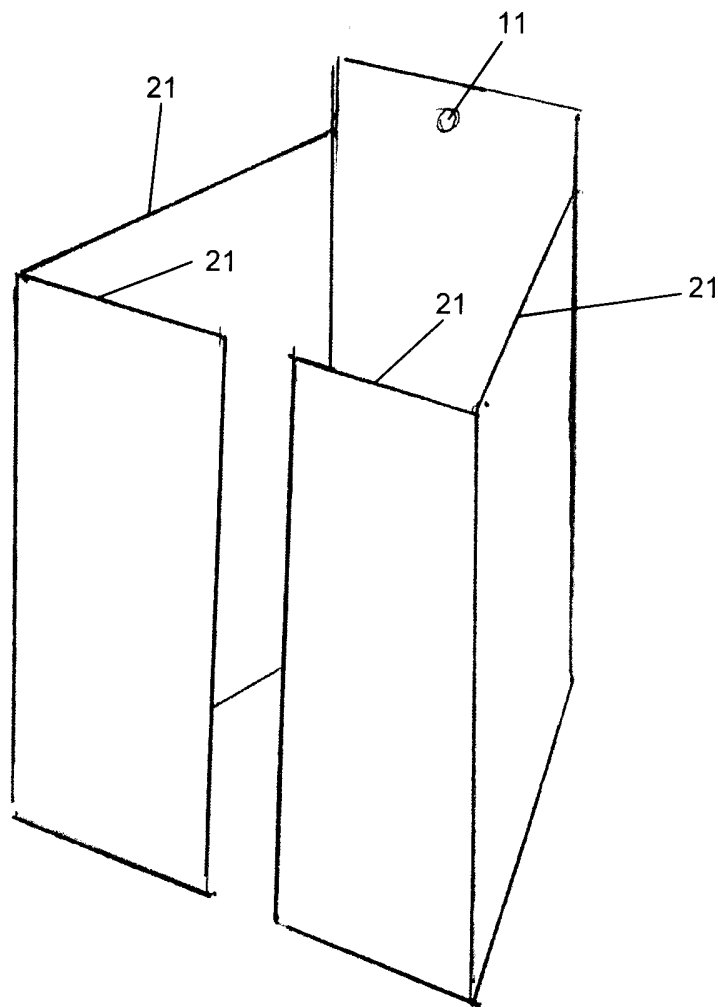


Fig. 3

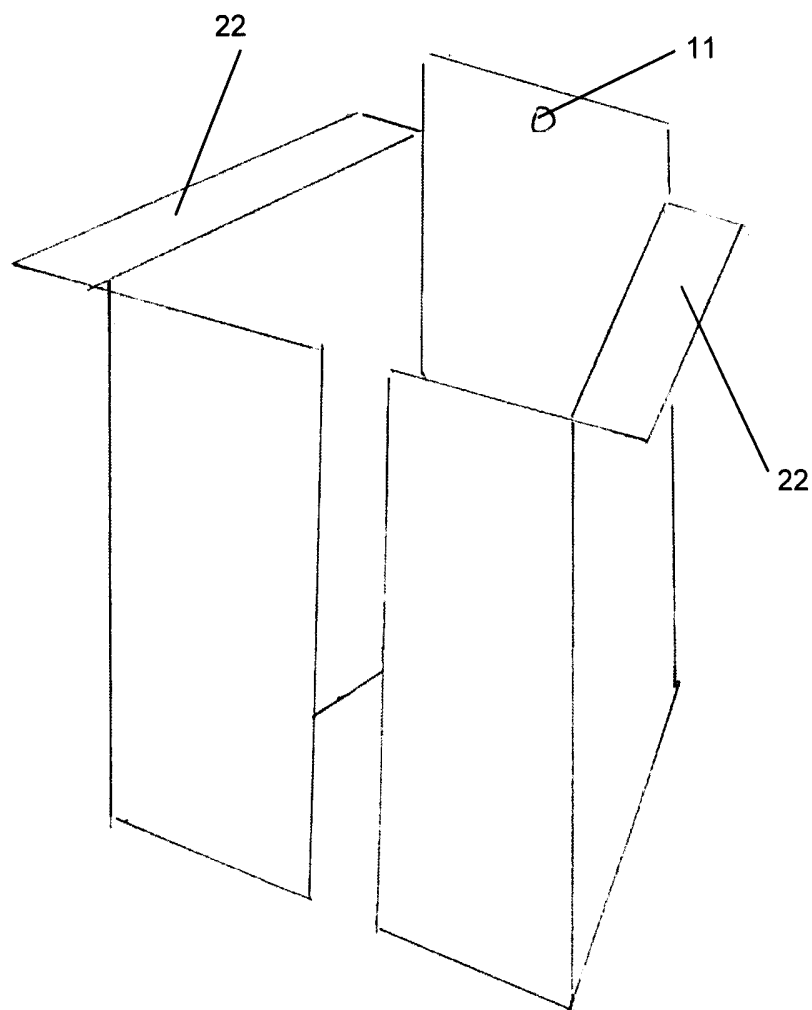


Fig. 4

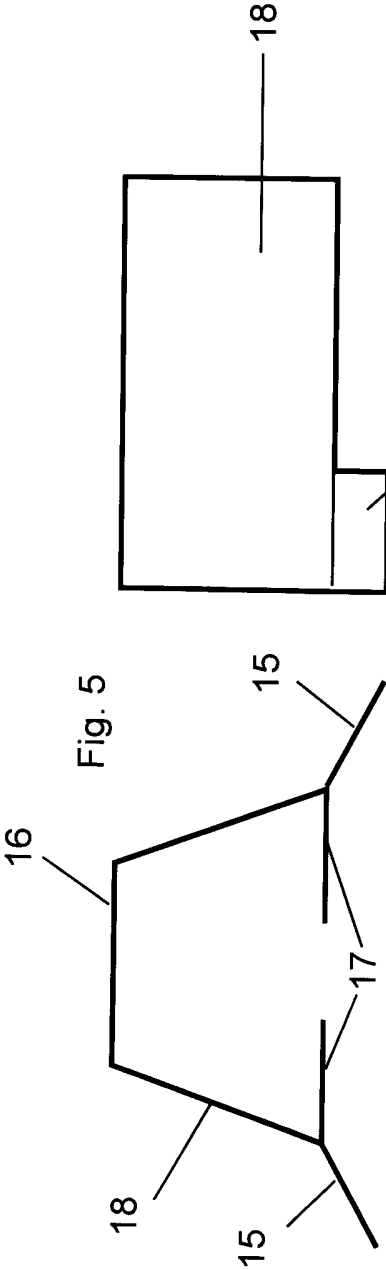


Fig. 6

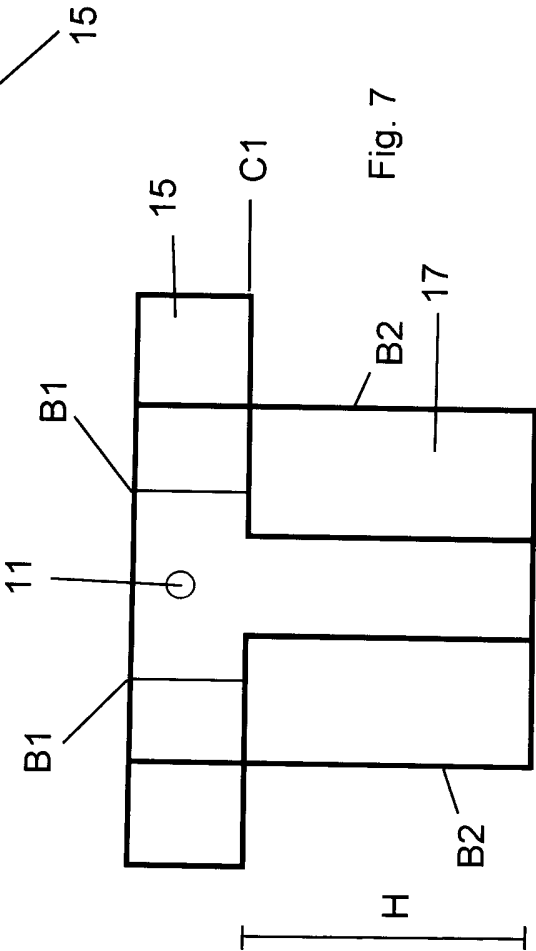


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2012/000216

<p>A. CLASSIFICATION OF SUBJECT MATTER</p> <p>IPC: E04F 13/21 (2006.01) , E04C 1/00 (2006.01) , E04F 13/24 (2006.01)</p> <p>According to International Patent Classification (IPC) or to both national classification and IPC</p>																				
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols)</p> <p>IPC (2006.01): E04F, E04F 13/21, E04C 1/00, E04F 13/14, E04F 13/26</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p> <p>Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)</p> <p>Canadian Patent Database (CPD), EPOQUE (Epodoc), Google Patents, Google Search Engine</p> <p>Keywords: brick, stone, clip, mortise, tenon, groove, wall, structure</p>																				
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>GB 2141156 A (MARCH, C. G.)12 December 1984 (12-12-1984) *Whole Document*</td> <td>1 to 4, 10, and 11</td> </tr> <tr> <td>X</td> <td>CA 2155825 A1 (BELTRAMI, P. A.) 1 September 1994 (01-09-1994) *Whole Document*</td> <td>1 to 3, and 10</td> </tr> <tr> <td>X</td> <td>CA 2526876 C (HUFF, R., et al.) 28 February 2006 (28-02-2006) *Whole Document*</td> <td>1</td> </tr> <tr> <td>X</td> <td>EP 0892125 A2 (STALL, H., et al.) 20 January 1999 (20-01-1999) *Whole Document*</td> <td>1</td> </tr> <tr> <td>X</td> <td>CA 2749337 A1 (BOUCHARD, M., et al.) 5 August 2010 (05-08-2010) *Whole Document*</td> <td>11</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	GB 2141156 A (MARCH, C. G.)12 December 1984 (12-12-1984) *Whole Document*	1 to 4, 10, and 11	X	CA 2155825 A1 (BELTRAMI, P. A.) 1 September 1994 (01-09-1994) *Whole Document*	1 to 3, and 10	X	CA 2526876 C (HUFF, R., et al.) 28 February 2006 (28-02-2006) *Whole Document*	1	X	EP 0892125 A2 (STALL, H., et al.) 20 January 1999 (20-01-1999) *Whole Document*	1	X	CA 2749337 A1 (BOUCHARD, M., et al.) 5 August 2010 (05-08-2010) *Whole Document*	11
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<p><input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.</p> <table border="1"> <tbody> <tr> <td>* Special categories of cited documents :</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"&" document member of the same patent family</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td></td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </tbody> </table>			* Special categories of cited documents :	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family	"O" document referring to an oral disclosure, use, exhibition or other means		"P" document published prior to the international filing date but later than the priority date claimed							
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<p>Name and mailing address of the ISA/CA</p> <p>Canadian Intellectual Property Office</p> <p>Place du Portage I, C114 - 1st Floor, Box PCT</p> <p>50 Victoria Street</p> <p>Gatineau, Quebec K1A 0C9</p> <p>Facsimile No.: 001-819-953-2476</p>		<p>Authorized officer</p> <p>Genevieve Scott (819) 953-1627</p>																		

INTERNATIONAL SEARCH REPORTInternational application No.
PCT/CA2012/000216**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons :

1. ☐ Claim Nos. :
because they relate to subject matter not required to be searched by this Authority, namely :
2. ☐ Claim Nos. :
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically :
3. ☐ Claim Nos. :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows :

Group A: Claims 1 to 9

A decorative wall system comprising: a supporting wall; a thin brick element having a decorative face, a top surface, a bottom surface, a thickness and a mortise formed therein; and a tenon clip having fastening means for insertion and retention within said mortise whereby said brick element is attached to said supporting wall by said fastening means.

[X] Continues on extra sheet on page 5 of 5.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claim Nos. :
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim Nos. :

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2012/000216

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
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Continuation of Box No. III

Group B: Claim 10

A tenon clip for affixing brick elements to a supporting wall surface, said tenon clip having a quadrilateral cross section comprising a first fastening side having a width, a second side having a width greater than the width of said first fastening side and sidewalls whereby all said sides are connected at the vertices.

Group C: Claim 11

A thin brick element having a decorative face, a top surface, a bottom surface, a thickness and a mortise aligned vertically and extending between said top and bottom surfaces.

The applicant's claims listed above include independent claims whose only common feature is a brick element. This feature is well known in the art, therefore any possible inventive step must be found in the additional technical elements found in the claims. However as the claim groups diverge to include different additional technical elements, unity of invention is lacking.