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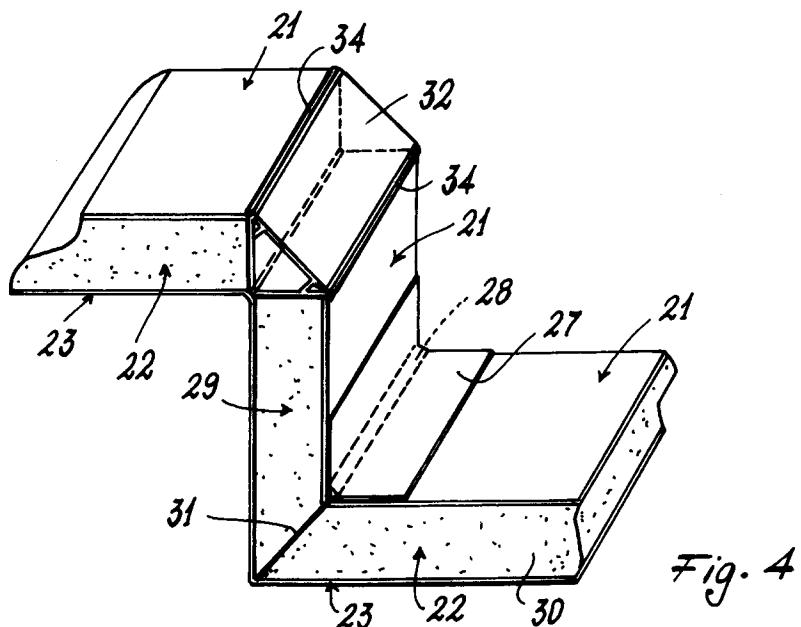
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㉒ **Prefabricated plasterboard element and a method for its production.**

㉓ A prefabricated plasterboard element of the type comprising a first (21) and a second (23) layer of cardboard or similar material and, between these, a layer (22) of plaster or similar material, comprising at

least two substantially flat parts (29, 30) forming a surface incorporating at least one angle. The element is a one-piece continuous body.



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This invention relates to a prefabricated plasterboard element for forming technical and/or decorative architectural details, and a method for producing such elements, in accordance with the introductory part of claims 1 and 13.

It has been known for some time to form architectural details using plasterboard, in rooms for both private and commercial use. Such details can for example be passages or casings for hiding cables or pipes, in which case in the present context these are defined as technical details. Architectural details can also be applied to already existing structures to modify their outer appearance, in which case in the present context these are defined as decorative details.

The formation and installation of technical and/or decorative details is a relatively lengthy and complicated operation. The details are generally formed directly on the site where they are to be installed, starting from a conventional plasterboard sheet of large dimensions (for example 3 m by 1.2 m).

Having taken all necessary measurements the operator manually cuts from the board the pieces necessary for forming the detail. Cutting is done by cutting through one of the cardboard layers of the sheet and at least partly through the underlying plaster layer using a blade. The sheet is then bent by hand until it breaks at the cut. The other layer of cardboard is then cut through to separate the required piece from the sheet. Having cut all the necessary pieces, for example (as shown in Figures 1 and 1A) two pieces 1 and 2, these are joined together and to the walls 3, 4 of the structure to which the detail is to be applied, using metal sections 5, 6, 7 and screws 9. Specifically, the metal section 5 is firstly fitted to a wall 3, then a first piece 1 of the plasterboard detail is fixed to the section, after which the sections 6 and 7 are fixed to the piece 1 and to the other wall 4 respectively. The other plasterboard piece 2 is then fixed to the first piece 1. The surface finish of the exposed corner 7 of the detail hence formed is of poor quality. The corner 7 therefore has generally to be finished manually using a rasp, after which a corner protection tape 8 has to be applied (Figure 1A). The corner 7 has finally to be carefully plastered. From the foregoing it is apparent that the operations involved in forming and installing known architectural plasterboard detail are relatively lengthy and complicated and have to be performed by expert personnel if good quality results are to be obtained.

An object of the present invention is to provide a prefabricated plasterboard element for forming architectural details which obviates the aforesaid drawbacks and in particular can be mounted easily and rapidly even by non-expert personnel.

A further object is to provide a prefabricated element which once installed does not require plastering or further finishing.

5 A further object is to provide a prefabricated element which is reliable and of low cost.

10 A further object of the present invention is to provide a method for producing prefabricated plasterboard elements for forming architectural details which simplifies and reduces the production time of said elements and enables their production to be automated.

15 These and further objects which will be apparent to the expert of the art are attained by a prefabricated element and a method for its formation, in accordance with the characterising parts of claims 1 and 13.

The present invention will be more apparent from the accompanying drawings, which are provided by way of non-limiting example and in which:

20 Figure 1 is a schematic cross-section through a known embodiment of a plasterboard element fixed to a structure (partly shown);

Figure 1A is an enlargement of that part indicated by the arrow A in Figure 1;

25 Figures 2A-D are cross-sections showing the different steps in a first method for forming an element according to the invention (shown partly);

30 Figures 3A-D are cross-sections showing the different steps in a second method for forming an element according to the invention (shown partly);

35 Figure 4 is a partial schematic perspective view of an element according to the invention;

Figures 5-10 are partial schematic perspective views of different differently shaped elements according to the invention;

40 Figure 11 is a schematic cross-section through an element according to the invention fixed to a structure (partly shown).

Figure 11A is an enlargement of that part indicated by the arrow B in Figure 11.

45 With reference to Figures 2A-D, for forming an element according to the invention, for example of the type shown in Figure 9, the procedure is as follows: from a plasterboard sheet a piece 20 is firstly cut having dimensions equal to those of the element to be formed, after which a notch 121 is mechanically cut in the piece 20 such as to remove a part of triangular cross-section, the notch being made such as to remove a portion of the first cardboard layer 22 and a portion of the plaster layer 23, but leaving the other cardboard layer 24 intact (Figure 2A). This operation can be carried out for example using a conventional milling machine. A usual glue, such as a heat-melting glue, is then poured into the cavity after which the two parts 29, 30 are rotated towards each other (Figure

2B) so that the two sides 24, 25 bounding the cavity make contact with each other and with the glue 31 (Figure 4). This operation can also be easily automated. At the intrados (Figure 2C) of the angular surface formed by the two joined parts of the architectural detail there is then applied a means 27 for supporting the two parts and fixing them together. This fixing means is for example (Figures 2C and 4) an adhesive tape 27 able to restore and maintain joined together the two constituent parts of the element. It should be noted that the tape 27 adheres to the cardboard layer 21 of the architectural detail to hence ensure optimum bonding between the two parts. It has been found experimentally that simply gluing the two plaster sides 24, 25 together (Figure 2A) does not generally ensure a good connection between the two sides, as the plaster does not offer a good gripping surface.

Advantageously, instead of the adhesive tape 27 a layer 28 of an adhesive material (Figure 2D and shown by dashed lines in Figure 4) of a type conventional to the expert of the art can be poured into the intrados 26 so that it touches and joins together the cardboard layer 21 of the two parts 29, 30 forming the element. It has been found experimentally that, provided that it grips onto the cardboard layer 21, even the application of a small layer of glue provides excellent joining of the constituent parts of the detail.

Figures 3A-3D show a method similar to that heretofore described. In this case, in the piece 20 cut from a plasterboard sheet, a cut 31 is made through one of the cardboard layers 21 and through the plaster layer 22, but leaving intact the other cardboard layer 23 (Figure 3A), the two parts 29, 30 into which the piece 20 has hence been divided are withdrawn from each other (Figure 3B) and are then retained in this position by a support and retention means which can for example be a usual rigid L section 33 (Figure 3C) or triangular section 32 (Figure 3D).

At least one portion 33A of each of the free edges of the L section 33 is rigidly fixed, preferably by a layer of a conventional glue, to the cardboard layer 27 of the element (Figure 3C).

The section 32 is also advantageously fixed to the detail by a conventional glue. It should be noted that in such a case in order to ensure reliable fixing of the section to the detail a layer of glue 34 is applied along the major sides of the section 32 so that this latter is also fixed to the cardboard layer 21 and not only to the plaster layer 29, which does not offer a good grip. To improve the in any event already good fixing, an adhesive tape can be applied over the section and onto the cardboard layer.

Figures 5, 6, 7, 8, 10 show by way of example some of the elements which can be obtained by the aforesaid methods.

To mount an element according to the invention (as shown in Figures 11 and 11A), the free ends E of the detail merely have to be fixed to the sections 5 and 7, which have been previously fixed to the walls 3, 4.

It should be noted that with the elements formed by the aforesaid method, once they have been installed it is no longer necessary either to smooth the exposed corners of the element or to plaster them. Their surface is in fact already smooth and uniform. In this respect, during the formation of the detail that cardboard layer 23 which remains exposed is in no way modified, and is hence ready for the subsequent operations.

In this manner a considerable saving is achieved in both the time and cost of installing the elements, non-specialized personnel can be used and the final result no longer depends on the expertise of the installer. Moreover as the element according to the invention consists of a single piece, during installation it is no longer necessary to join various pieces together by joints as was done in the case of details known up to the present time. In this manner the element installation time and cost are further reduced. The aforescribed method can be used both for forming preformed elements to be stored and sold as pieces of standard shape and dimensions able to satisfy most market requirements, and for forming special pieces once measurements have been taken on site. In this manner and because of the use of automatic machines for forming the elements, these latter have a quality finish and constant dimensional tolerances.

It should be particularly noted that the elements according to the invention can be advantageously also used for laterally finishing false ceilings using angular or stepped elements (see for example Figures 6, 7, 8, 9).

It should finally be noted that the aforescribed embodiments are provided by way of example only, and that numerous modifications all falling within the same inventive concept are possible. For example the element shapes could be different from the aforesaid, as can the form of the support and fixing means (27, 28, 32, 33). Moreover in particular, to join together the two parts 28 and 29 of the element, the glued rigid sections 32 could be replaced by a usual expandable adhesive material which on hardening would perform a function analogous to that of the supports 32.

## Claims

1. A prefabricated plasterboard element of the type comprising a first and a second layer of cardboard or similar material and, between these, a layer of plaster or similar material, comprising at least two substantially flat parts forming a surface incorporating at least one angle, said element comprising an inner face and an outer face, characterised in that the element is a one-piece continuous body. 5
2. An element as claimed in claim 1, characterised in that in its inner face a notch (121; 31) is provided at the angle formed by the two parts (29, 30), its outer face being continuous and intact. 10
3. An element as claimed in claim 2, characterised in that the notch (121; 31) involves only part of the thickness of the prefabricated element. 15
4. An element as claimed in claim 3, characterised in that the notch (121; 31) involves the cardboard layer (21) of the inner face and the plaster layer (22), the other cardboard layer (23) of the outer face remaining intact and continuous. 20
5. An element as claimed in claim 1, characterised in that the notch (121) has a substantially triangular cross-section. 25
6. An element as claimed in claim 1, characterised in that the notch is a cut (31). 30
7. An element as claimed in claim 1, characterised in that means (31) for fixing the two parts (29, 30) together are provided in the notch (121; 31). 35
8. An element as claimed in claim 7, characterised in that the fixing means (31) are an adhesive material. 40
9. An element as claimed in claim 1, characterised by comprising, in correspondence with the inner face of the notch, means for fixing together and/or supporting the two parts (29, 30), said means engaging on at least one portion of the cardboard layer (21) of the inner face of the element. 45
10. An element as claimed in claim 9, characterised in that the fixing and/or support means comprise a layer (28) of an adhesive material. 50

11. An element as claimed in claim 9, characterised in that the fixing and/or support means comprise an adhesive material and a substantially rigid section piece (32, 33). 5
12. An element as claimed in claim 9, characterised in that the fixing and/or support means comprise an adhesive or adhesivized tape (27). 10
13. An element as claimed in claim 1, characterised in that the fixing and/or support means comprise a layer of an expandable adhesive material. 15
14. A method for forming prefabricated elements claimed in claim 1, characterised by comprising:
  - a first (2A, 3A) step in which at least one notch (121, 31) is formed in a portion of a plasterboard sheet to divide the portion into at least two parts (29, 30), said notch involving one (21) of the cardboard layers and the plaster layer (22) but not the other cardboard layer (23) which remains intact, said portion having its surface equal to the plan development of said element;
  - a second step (2B, 3B) in which one of the two parts is rotated relative to the other in correspondence with and by virtue of said notch (121; 31) so that said parts form a surface comprising an angle at said notch;
  - a third step (2C, 2D; 3C, 3D) in which means (31, 32, 27, 28) for fixing the two parts (29, 30) together are associated with the two parts at said angle, said means involving the plaster layer (22) and/or a portion of that cardboard layer which remains hidden and has been interrupted by said notch.
15. A method as claimed in claim 14, characterised in that the three steps are performed automatically. 30
16. A method as claimed in claim 14, characterised in that the notch (121; 31) is obtained by milling or cutting the plasterboard portion. 40
17. A method as claimed in claim 14, characterised in that the third step is performed before the second step and comprises the application of an adhesive material into the notch (121; 31). 50

18. A method as claimed in claim 14, characterised in that said third step comprises the application of a layer or seam (28) of adhesive material on the inner face of the element and notch (121; 31) so that it involves a portion of the cardboard layer (21) of the face which remains hidden. 5

19. A method as claimed in claim 14, characterised in that the fourth step comprises the application of a substantially rigid section piece (32, 33) at the hidden face of the element and notch (121; 31). 10

20. A method as claimed in claim 14, characterised in that the forth step comprises the application of an adhesive or adhesivized tape (27) at the hidden face of the element and notch (121; 31). 15

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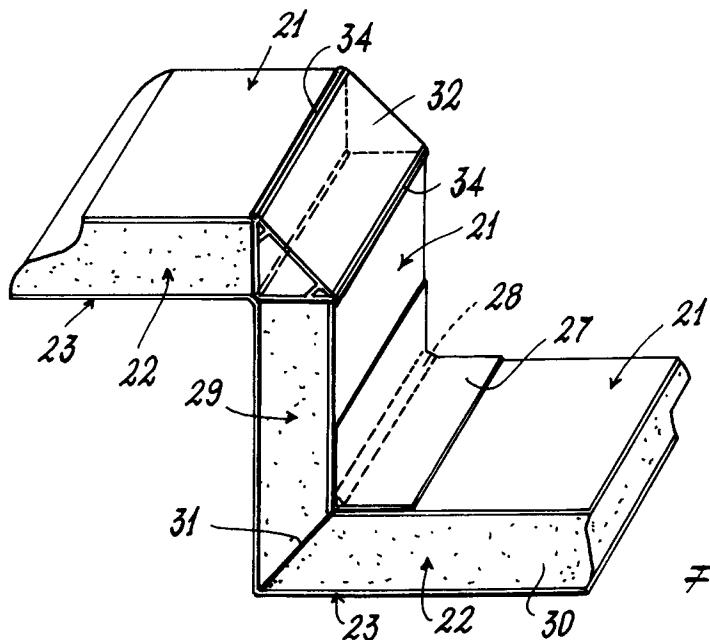
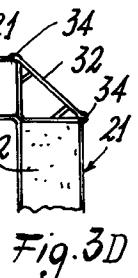
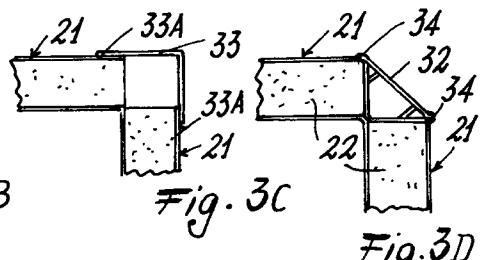
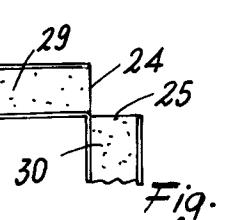
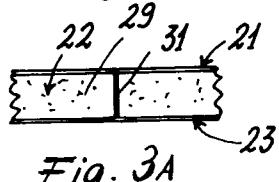
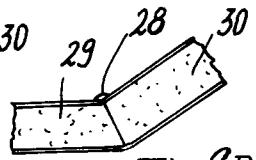
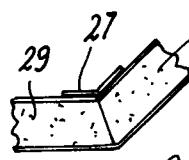
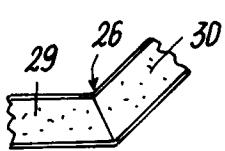
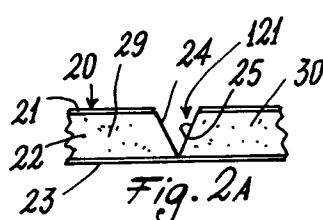
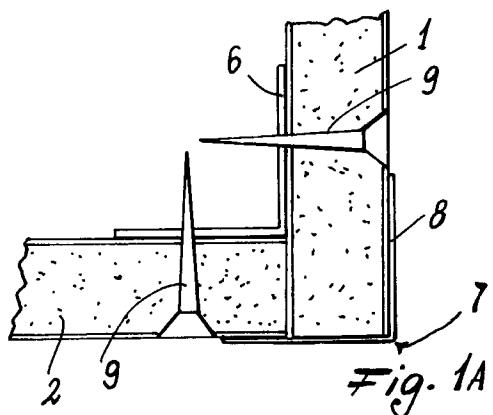
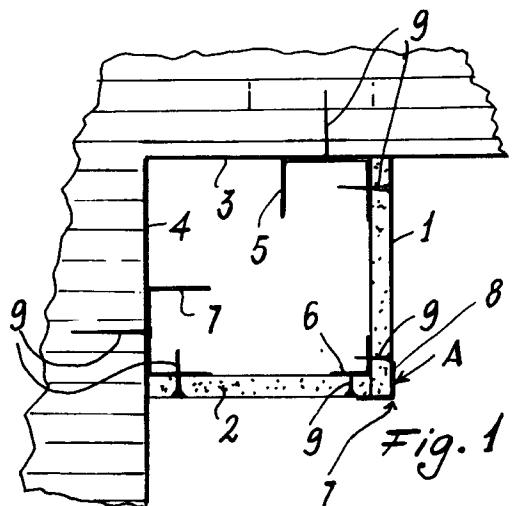


Fig. 4

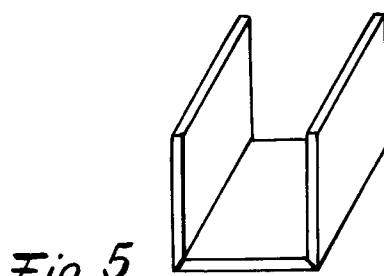


Fig. 5

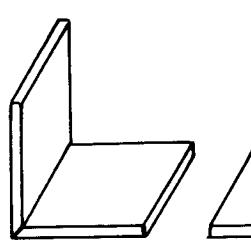


Fig. 6

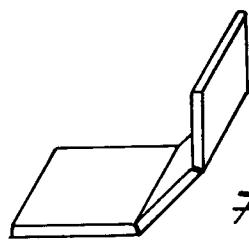


Fig. 7

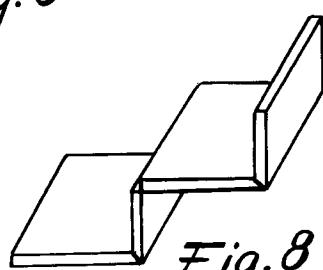


Fig. 8

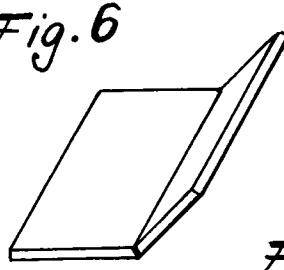


Fig. 9

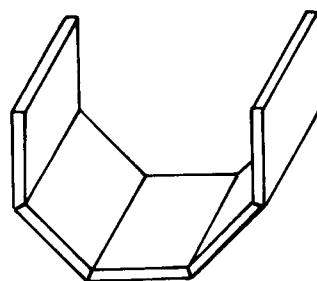


Fig. 10

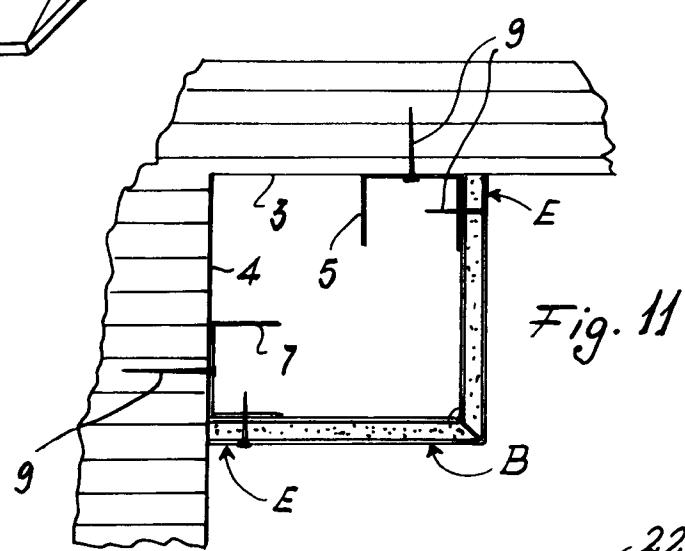


Fig. 11

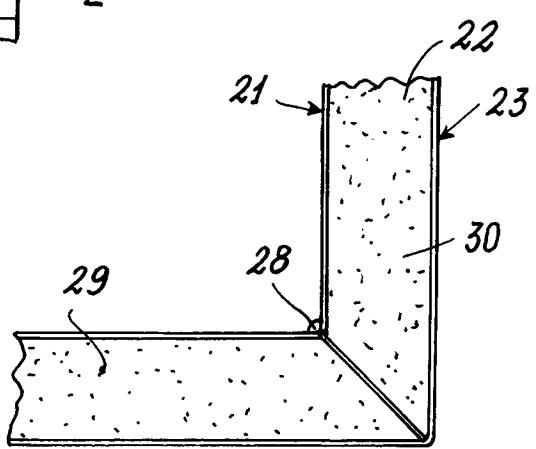


Fig. 11A



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EUROPEAN SEARCH REPORT

Application Number  
EP 94 12 0093

DOCUMENTS CONSIDERED TO BE RELEVANT									
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)						
X	DE-A-27 00 076 (KIRK)  * page 14, line 20 - page 16, line 4; figures 1,5 * ---	1-11, 14, 16-19	E04B2/72						
X	DD-A-142 366 (SCHULTZ)  * page 6, line 1 - page 9, line 12; figures 1,3 * ---	1-10, 14, 16-18							
X	DATABASE WPI Section PQ, Week 9325, Derwent Publications Ltd., London, GB; Class Q44, AN 93-197483 & AU-D-2 746 892 (TUCKER) 6 May 1993 * abstract * ---	1-6, 9, 12, 14, 16, 20							
X	DE-A-34 05 864 (RIGIPS GMBH)  * page 7, line 10 - page 8, line 7; figures 1-3 * -----	1-8, 14, 16							
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)						
			E04B E04F						
<p>The present search report has been drawn up for all claims</p> <table border="1"> <tr> <td>Place of search</td> <td>Date of completion of the search</td> <td>Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>30 March 1995</td> <td>Porwoll, H</td> </tr> </table> <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... &amp; : member of the same patent family, corresponding document</p>				Place of search	Date of completion of the search	Examiner	THE HAGUE	30 March 1995	Porwoll, H
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