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## (54) Fire resistant partition and frame therefor.

(57) The method according to the invention has the characteristic that gypsum or similar fire-resistant material (29) is arranged in the frame profiles (5) during prefabrication, wherein cavities (30) for frame clamps and mitre joints are left open, and that the thus prefabricated frame profiles are transported to their mounting location in the building structure and are fixed to the wall edges.

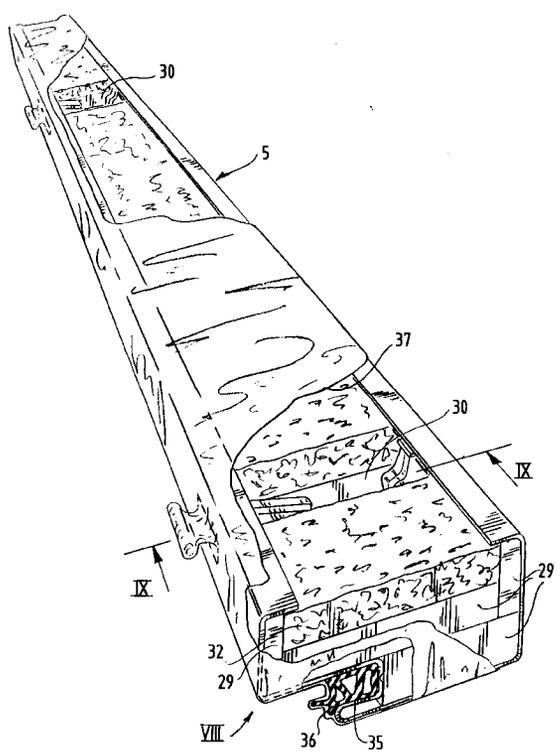


FIG.2

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The invention relates to a method for manufacturing a fire-resistant partition as designated in the preamble to claim 1.

Such a method is known. Gypsum is herein injected through an opening arranged for this purpose in the frame into the space bounded by the wall edges and the inner side of the frame profiles. The frame clamps and the mitre joints are herein embedded in the gypsum.

In practice the operation of filling the frame is often found to have been carried out poorly because the filling is not performed adequately. It is in any case not possible to see from outside whether filling has taken place correctly or not.

In the case the frame is placed at a late stage in the building, for example after wallpapering has already taken place and/or floor covering has been laid, there is the danger of liquid or plastic material being spilt on wallpaper and/or floor covering. This danger then occurs particularly when gypsum is injected with considerable pressure, which is otherwise necessary to realize an adequate filling in a short time.

The invention provides a method as designated in claim 1 with which the above stated problems are resolved.

It is possible on the one hand to guarantee arrangement in simple manner of sufficient fire-resistant material in the frame profiles during the manufacturing process, while on the other hand the danger of causing a mess in a practically finished building structure is avoided.

The invention also relates to and provides a fire-resistant partition as according to claim 4 in addition to a frame as according to claim 6.

Mentioned and other features of the invention will be found in the description following hereinbelow with reference to a drawing, wherein by way of example:

Figure 1 shows a perspective view of a preferred embodiment of a fire-resistant partition according to the invention;

Figure 2 is a perspective view of a frame profile for a fire-resistant partition according to figure 1;

Figures 3 and 4 show on larger scale a perspective broken away view of detail III respectively IV of figure 1;

Figure 5 shows on larger scale a perspective broken away view of detail V of figure 4;

Figure 6 shows a variant of figure 5;

Figure 7 shows a variant of figure 2;

Figure 8 is a variant of fraction VIII of figure 2;

Figure 9 shows the cross section IX-IX in figure 2; and

Figure 10 shows on larger scale detail X of figure 1.

The fire-resistant partition of figure 1 serves to mutually close off two zones 2 and 3 of a building structure such that fire in the one zone is prevented from reaching the other zone for a period of 20 or preferably 30 minutes or more.

The fire-resistant partition 1 according to the invention comprises a fire-resistant frame consisting of three U-shaped steel frame profiles 4-6 which are arranged on edges 7 of a wall opening with deforming of the U-shape of these frame profiles, which are mutually connected by means of mitre joints 8 (figure 10) and which are fixedly clamped to the edges 7 by means of clamps 10 which are arranged in frame profiles 4-6 and provided with adjusting means 9 (figure 9). The clamps 10 consist for instance of a U-shaped clamping bracket which is constructed from a zigzag element 12 and an element 13 engaging hingedly thereon. These elements 12 and 13 are welded with their edges 14 to frame profiles 15. A bolt 18 placed through element 12 and accessible with a socket head wrench through a hole 16 of profile 5 is screwed into a nut 17 welded to element 13. Through tightening of bolt 18 the frame profile 5 is deformed and fixedly clamped onto the edge 7.

Profiles 4-6 are mitred at the corners and have welded on the corners mitre connecting plates 21 whereof teeth 22 and 23 are mutually engaging. In addition the horizontal frame profile 6 for instance has welded thereon a strip 24 bent at right angles and engaging round the top edge 25 of a vertical frame profile 4, 5.

The frame profile 5 situated on the hinge side of a door 26 has fixed hinge wings 27 fastened thereto which are each fastened to an element 12 by means of a screw 28.

According to the invention strips 29 of gypsum or similar crystalline bonded, water-containing, fire-resistant material such as Rinovlam "S" and/or gypsum board are fixedly glued into the frame profiles 4, 5, 6, this during prefabrication, wherein cavities 30, 31 for clamps 10 and mitre joints 8 are left open. During mounting these cavities 30, 31 can be filled with for instance rockwool. Also arranged on the open side of profiles 4-6 are loose fibrous strips 32 of rockwool which are compressed by incoming wall edges 7. Each cover 4-6 preferably has a chamber 35 for receiving a rubber sealing profile 36 against which a door edge lies sealingly. After prefabrication in a factory each frame profile 4-6 is wrapped in a plastic foil 37 to prevent damage during transport to the lacquer layer applied thereto and to hold in place and protect the fire-resistant material.

According to figure 7 gypsum or similar fire-resistant material is arranged in liquid or plastic state in the frame profile 5, wherein cavities 30 and 31 are again left open.

A metal threshold 38 forms part of the frame and is fixed to the bottom ends of the frame profiles 4 and 5.

A per se known fire-resistant door 26 has uprights of hardwood, an upper cross beam of chipboard and a lower beam of pinewood. Both skin panels 40 con-

sist of a 3 mm thick duratex board. The inner space is filled with Umilin flax fibre board 41. Present on the uprights and the upper cross beam is a strip 42 of material which is foam-expanding in heat. At the hinges 44 the door 26 has hooks 43 which grip into holes in the frame profile 5 as extra protection for the case that the hinges 44 fail. Optionally received in frame profile 4 on the closing side is a locking pin 45 which is urged outward by a screw spring 46 into an adapted recess 47 in the case a fusible plug 48 melts when exposed to heat (figure 5). As alternative hereto a locking pin 45 is urged outward, in the case of heat, by foam-expanding material 49.

It should be noted that the cavities 30 and 31 need only be so large that the movable parts of clamps 10 and mitre joints 8 can still move during fitting of the frame.

The material thickness of frame profiles 4-6 is about 1 mm. At the location of the rebate 35 the material thickness is 0.5 mm over a considerable distance in order to limit heat transfer over the frame profile 4-6 from the one to the other side of the rebate.

## Claims

1. Method for manufacturing a fire-resistant partition for a zone of a building structure, comprising a fire-resistant frame fixed to wall edges of a wall passage and a fire-resistant door received therein, which frame comprises substantially U-shaped, steel frame profiles which are arranged on edges (7) of the wall opening with deforming of the U-shape of the frame profiles (4-6) and are fixedly clamped to said edges by means of clamps (10) arranged in the frame profiles (4-6) and provided with adjusting means (9), wherein the frame profiles (4-6) are mutually connected by means of mitre joints (8) and wherein in the space bounded by the inner side of the frame profiles (4-6) and the wall edges (7) gypsum or similar crystalline bonded, water-containing, fire-resistant material (29) is arranged, **characterized in that** gypsum or similar fire-resistant material (29) is arranged in the frame profiles (4-6) during prefabrication, wherein cavities (30, 31) for frame clamps 10 and mitre joints 8 are left open and that the thus prefabricated frame profiles (4-6) are transported to their mounting location in the building structure and are fixed to the wall edges (7).

2. Method as claimed in claim 1, **characterized in that** strips (29) of gypsum or similar water-containing material are fixedly adhered to the inside of the profiles (4-6).

3. Method as claimed in claim 1, **characterized in that** gypsum (29) or similar water-containing material is arranged in plastic or liquid form in the frame profiles (4-6) during a prefabrication.

4. Fire-resistant partition manufactured as claimed in claim 1, 2 or 3 for a zone of a building structure, comprising a fire-resistant frame disposed in a wall passage and a fire-resistant door (26) received therein, which frame comprises substantially U-shaped, deformable profiles (4-6) in which are fixed clamps (10) provided with adjusting means (9) and mitre connecting means (8) and wherein gypsum or similar water-containing, fire-resistant material is arranged, **characterized in that** gypsum (29) or similar crystalline bonded, water-containing, fire-resistant material is arranged in the frame profiles (4-6) during prefabrication, wherein cavities (30, 31) for frame clamps (10) and mitre corner joints (8) are left open.

5. Fire-resistant partition (1) as claimed in claim 4, **characterized in that** the frame has a locking pin (45) received therein which moves outward out of the frame profile (4) under the influence of fire heat into a recess (47) arranged for this purpose in the closing edge of the door (26).

6. Frame for a fire-resistant partition (1) as claimed in claim 1, which frame comprises substantially U-shaped deformable profiles (4-6) in which are fixed clamps (10) provided with adjusting means (9) and mitre connecting means (8) and in which gypsum or similar crystalline bonded, water-containing, fire-resistant material (29) is arranged, **characterized in that** gypsum or similar crystalline bonded, water-containing, fire-resistant material (29) is arranged in the frame profiles (4-6) during prefabrication, wherein cavities (30, 31) for frame clamps (10) and mitre corner joints (8) are left open.

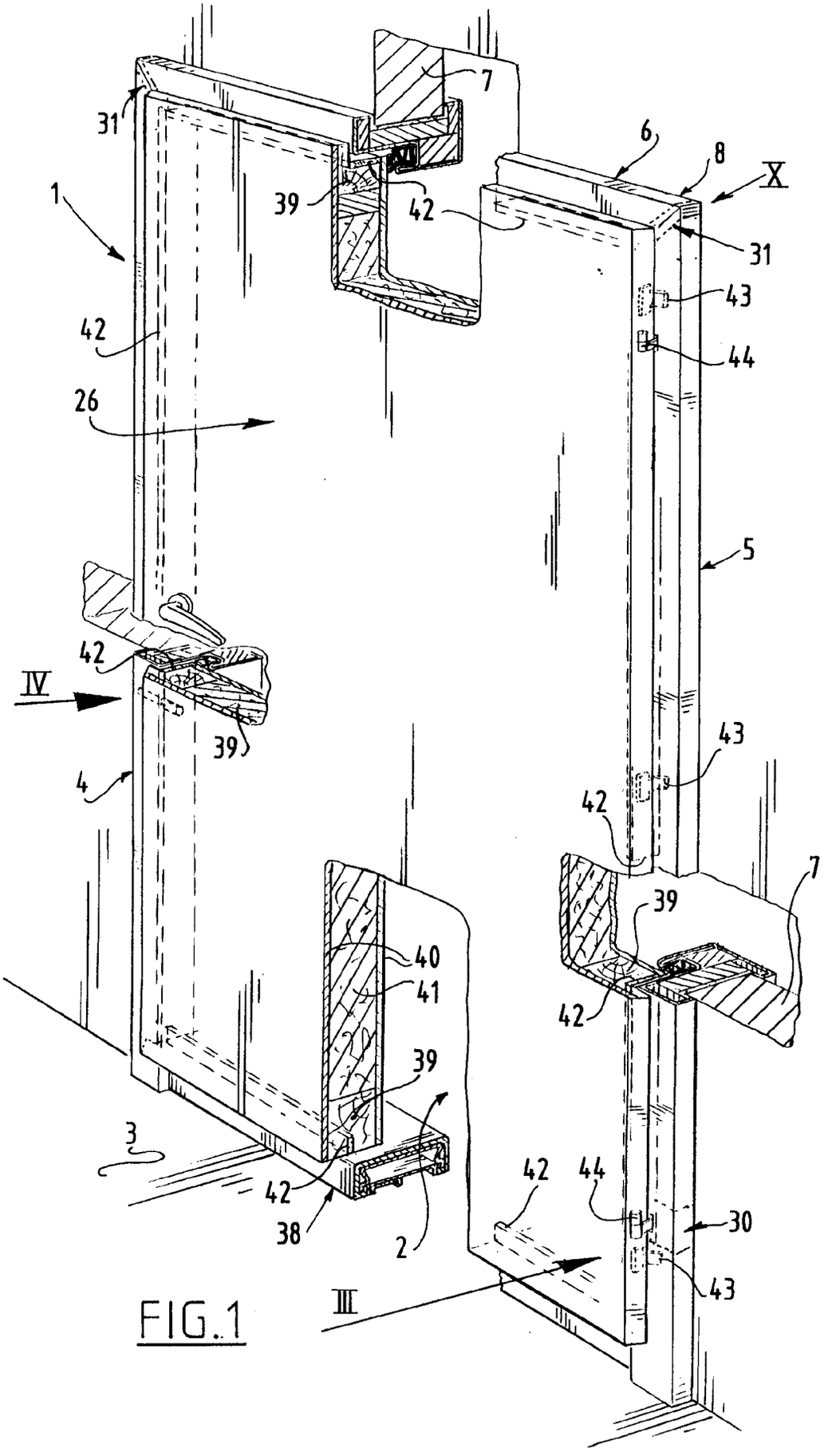
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FIG.1

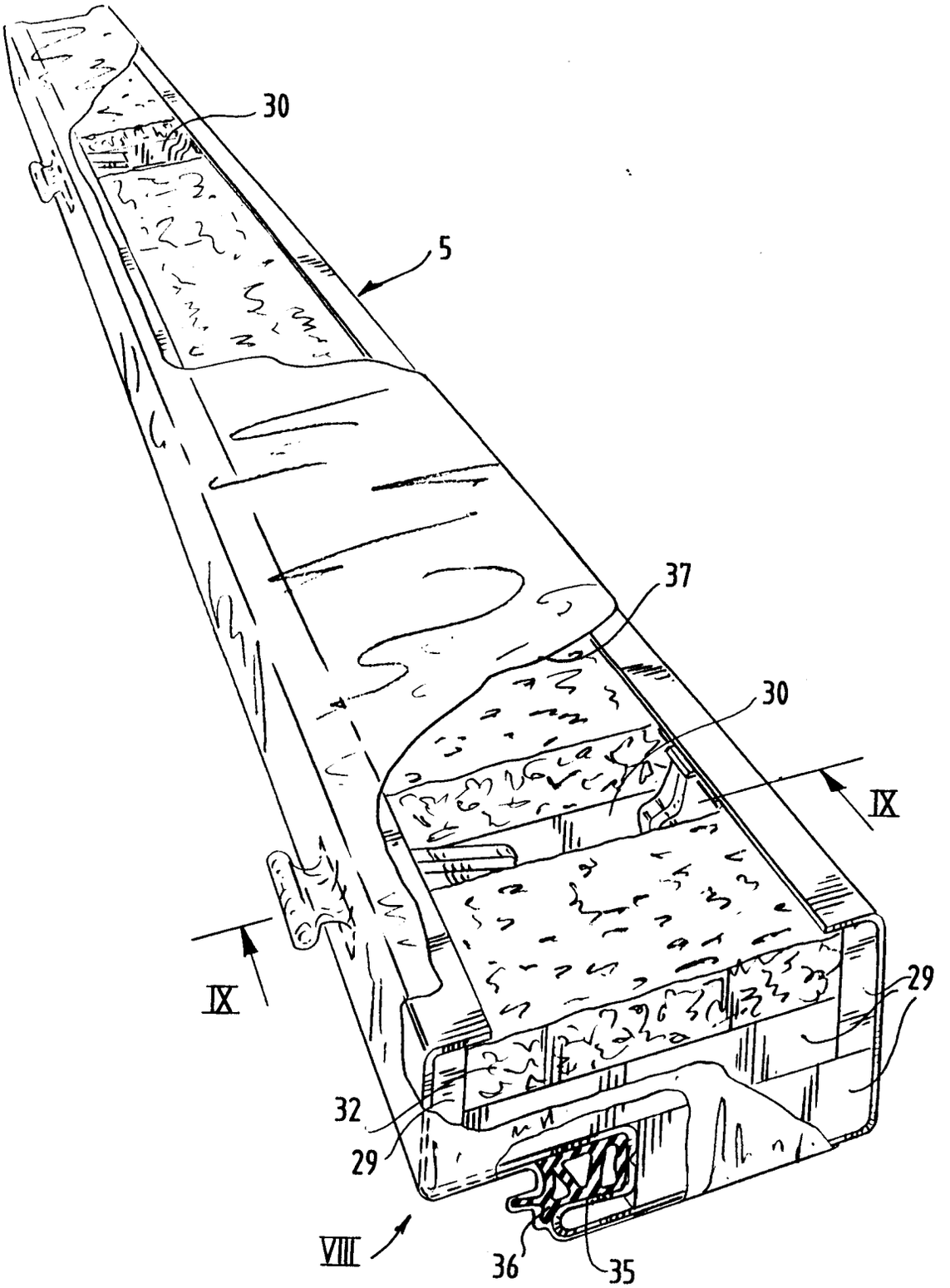


FIG.2

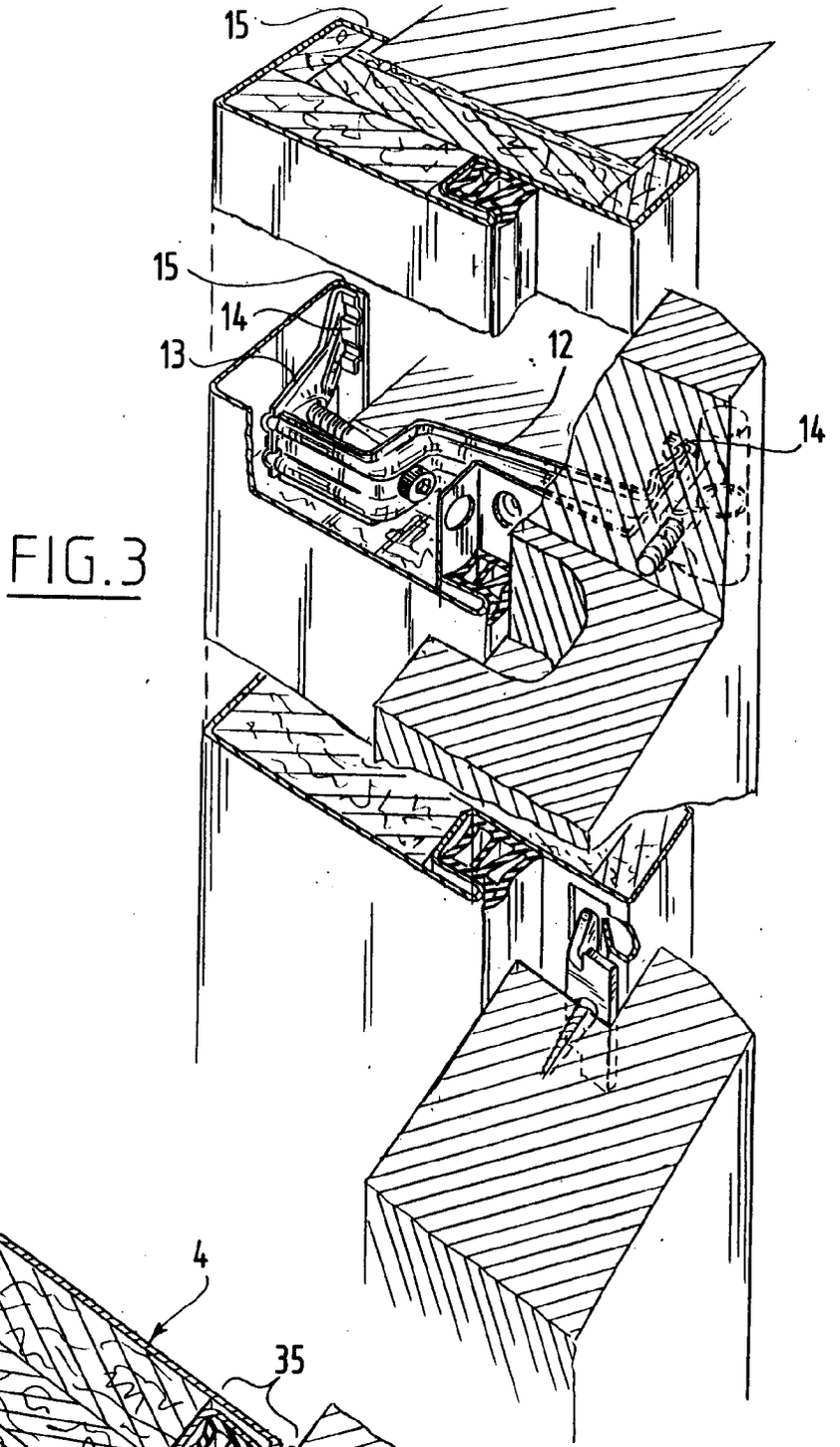


FIG.3

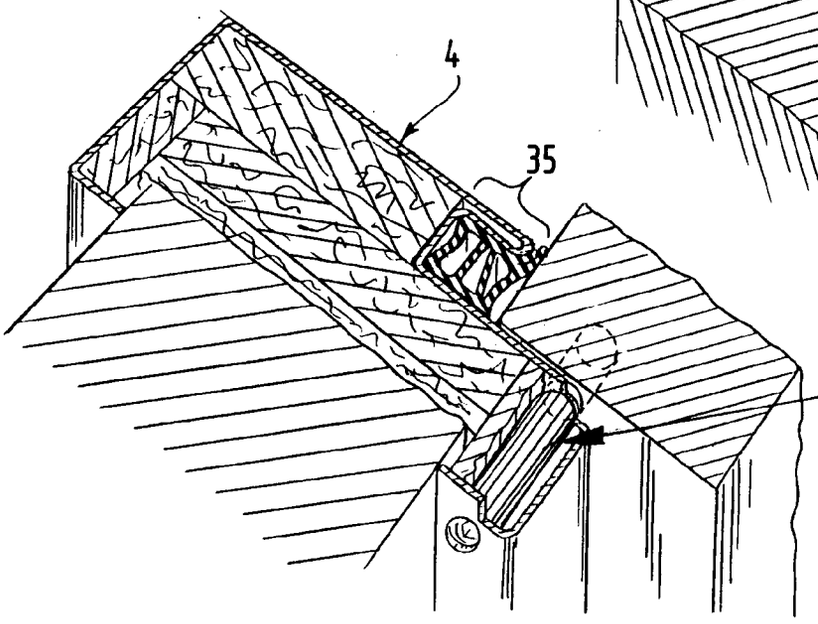


FIG.4

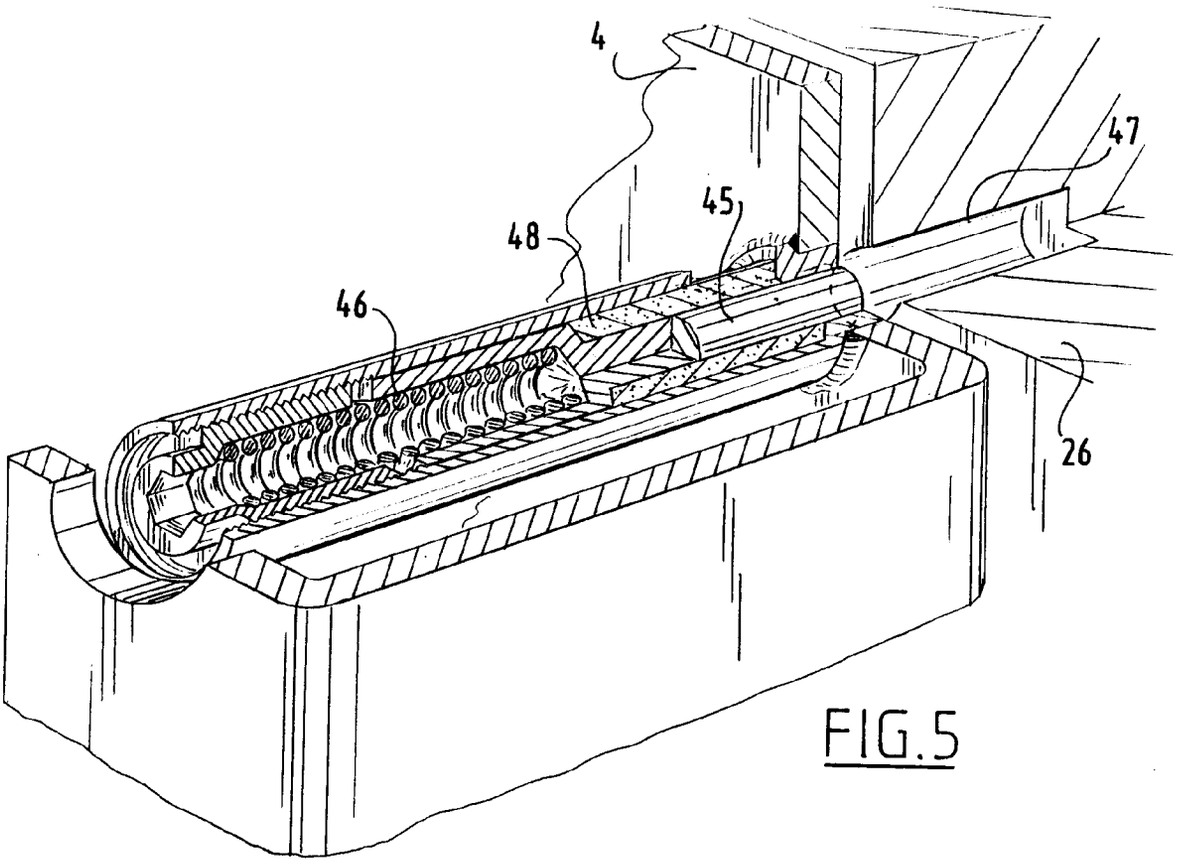


FIG.5

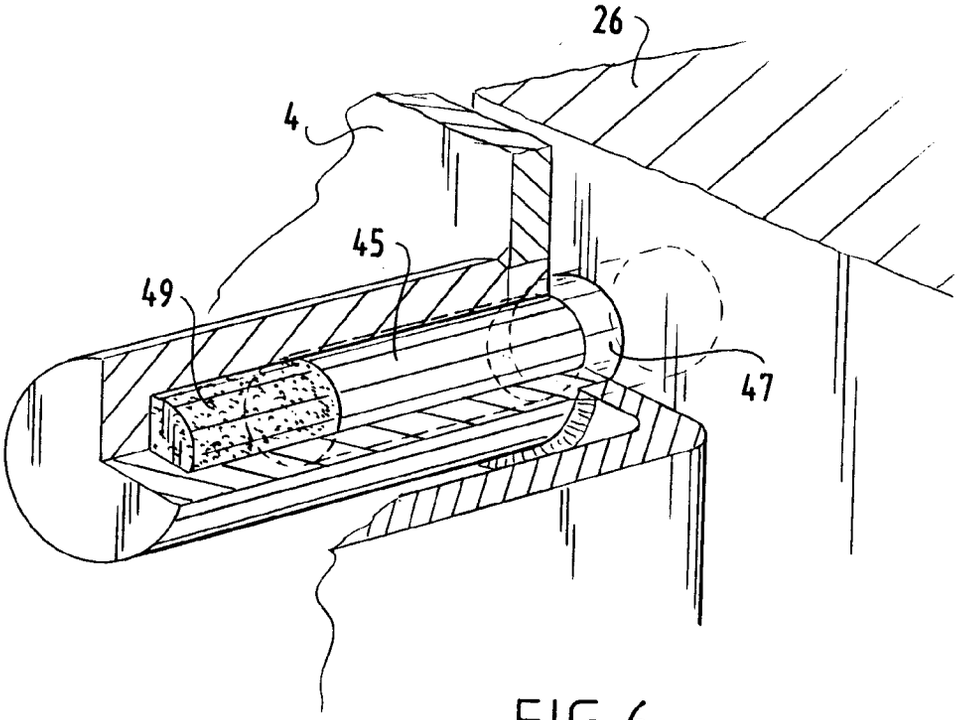


FIG.6

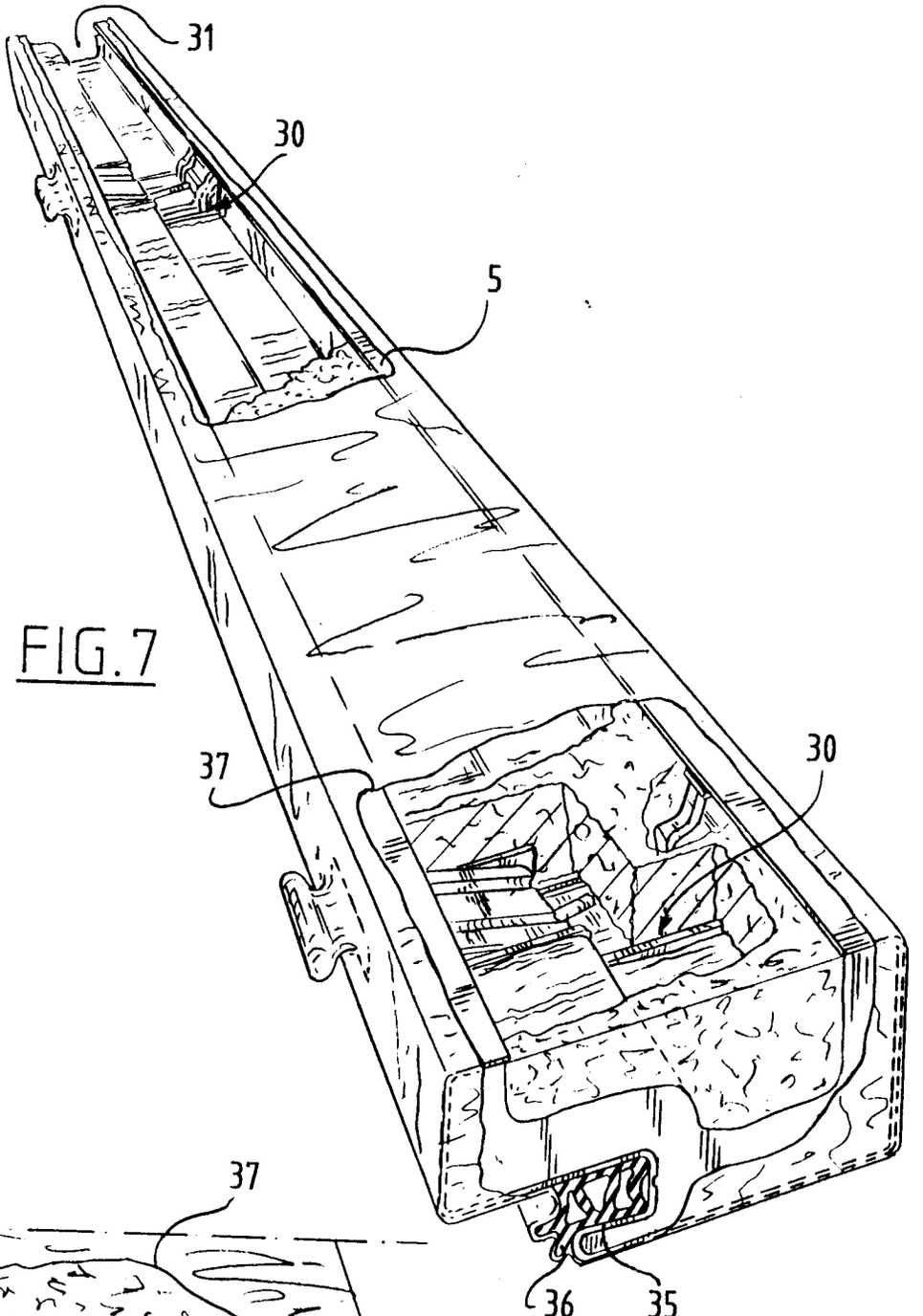


FIG.7

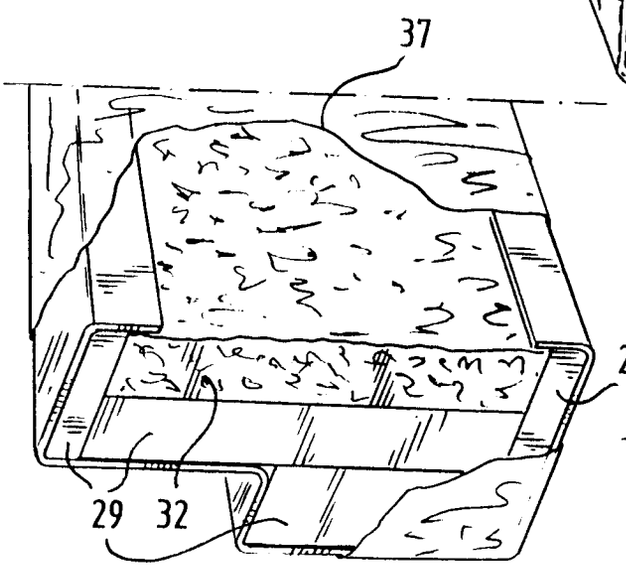


FIG.8

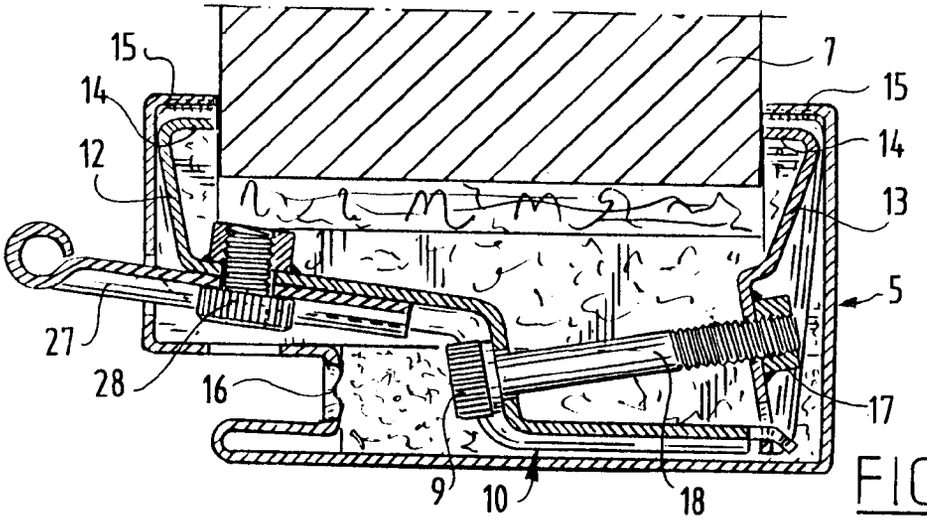
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FIG.9

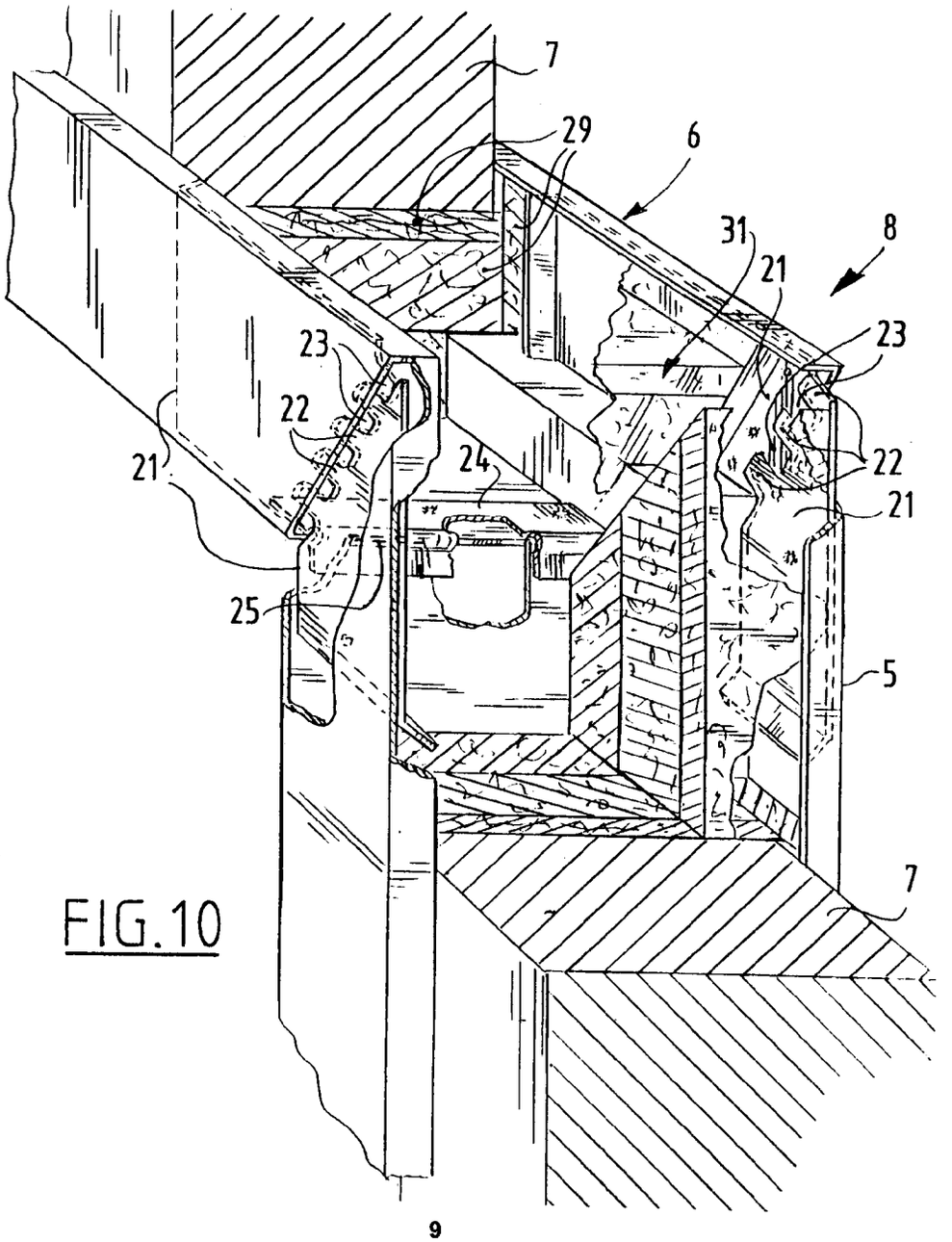
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FIG.10

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# EUROPEAN SEARCH REPORT

Application Number
EP 94 20 2997

## 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) |
|---|---|---|---|
| Y | EP-A-0 140 436 (POLYNORM)<br>* claims 1,2; figures *<br>--- | 1,2,4,6 | E06B5/16 |
| Y | DE-U-84 37 574 (AKUSTIKBAU LINDNER)<br>* claim 3 *<br>* page 3, paragraph 5 - page 4, paragraph 1 *<br>* page 4, paragraph 4 *<br>* figures *<br>--- | 1,2,4,6 | |
| A | NL-A-7 113 291 (POLYNORM)<br>* claim 1; figures *<br>--- | 1,4,6 | |
| A | US-A-2 554 399 (BREMER)<br>* column 1, line 8 - column 2, line 18 *<br>* column 3, line 63 - line 75 *<br>* column 4, line 71 - line 73 *<br>* column 6, line 63 - column 7, line 29 *<br>* figures *<br>--- | 1-4,6 | |
| A | FR-A-2 422 803 (FURIERI)<br>* the whole document *<br>--- | 3 | TECHNICAL FIELDS SEARCHED (Int.Cl.6)<br>E06B |
| A | GB-A-2 237 835 (MANCHESTER CITY COUNCIL)<br>* page 17, line 22 - page 19, line 11 *<br>* figures 10-12 *<br>----- | 5 | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 6 February 1995 | Depoorter, F |

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