

604155
FORM 1
REGULATION 9

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952-1973

APPLICATION FOR A PATENT

We RITTAL-WERK RUDOLF LOH GMBH & CO. KG.

of Auf dem Stutzelberg, D-6348 Herborn, GERMANY

hereby apply for the grant of a Patent for an invention entitled:

SWITCH CABINET

which is described in the accompanying complete specification. This Application is a Convention Application and is based on the Application(s) numbered: P 37 31 547.1-34 for a Patent or similar protection made in Germany on 19 September 1987.

Our address for service is:

GRIFFITH HACK & CO.
71 YORK STREET
SYDNEY N.S.W. 2000
AUSTRALIA

DATED this 14th day of September, 1988.

RITTAL-WERK RUDOLF LOH GMBH & CO. KG.
By their Patent Attorneys

GRIFFITH HACK & CO.

TO: THE COMMISSIONER OF PATENTS
COMMONWEALTH OF AUSTRALIA

9820A:rk

APPLICATION ACCEPTED AND AMENDMENTS
ALLOWED 13-9-88

14/09/88

FORM 8

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

DECLARATION IN SUPPORT OF AN APPLICATION FOR A PATENT

In support of an application made by: RITTAL-WERK RUDOLF LOH GMBH & CO. KG.

for a patent for an invention entitled: "SWITCH CABINET"

I, Friedhelm Loh
of Auf den Weisen, D-6344 Dietzhöhlztal 1

do solemnly and sincerely declare as follows:

1. I am authorised by the above mentioned applicant for the patent to make this declaration on its behalf.

2. The name and address of each actual inventor of the invention is as follows:

Jürgen Debus of Am Ebersbach 50, 6344 Dietzhöhlztal 1 GERMANY
Hans-Georg Koch of Sonnenstr. 28, 6344 Dietzhöhlztal 1 GERMANY
Jürgen Zachrei of Am Hungersberg 2, 6340 Dillenburg 8 GERMANY
Helmut Bütergerds of Jahnstrabe 12, 6346 Eschenburg 1 GERMANY

and the fact upon which the applicant is entitled to make this application are as follows:

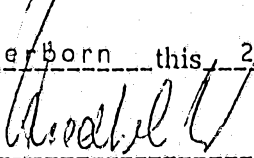
The applicant is the assignee of the invention from the inventors.

3. The basic application as defined by Section 141 of the Act was made as follows:

In WEST GERMANY on 19 September 1987
in the name RITTAL-WERK RUDOLF LOH GMBH & CO. KG.

4. The basic application referred to in the preceding paragraph of this Declaration was the first application made in a Convention country in respect of the invention the subject of this application.

✓ Declared at Herborn this 22 day of March 1990

✓ Signed: 

✓ Position: Manager

GRIFFITH HACK & CO., G.P.O. BOX 4164, SYDNEY N.S.W 2001
AUSTRALIA

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(54) Title
SWITCH CABINET

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(71) Applicant(s)
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(56) Prior Art Documents
AU 47685/72 H05K 7/18
AU 65444/60 H05K 5/04
AU 57173/60 H05K 5/02

(57) Claim

1. A switch cabinet comprising a frame made up of a base panel, a top panel, side face panels and open side faces which are arranged to be closed by means of a cabinet door and a rear wall or two cabinet doors, each panel having at least two opposing bent side walls, which each comprise a vertical first segment which at its distal end is bent into a second segment which extends perpendicular thereto to the outside of the cabinet to be formed, the distal end of the second segment being bent into a third segment which extends parallel to the second segment, past the first segment and to the interior of the cabinet to be formed, the part of the third segment which extends past the first segment having a row of holes provided therein in the direction of the length of the bent side wall, the distal end of the third segment being bent into a fourth segment which extends towards the bottom of the panel and parallel to the first segment, and having a row of holes in the direction of the length of the bent side wall and aligned with the holes of the third segment.

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

Form 10

COMPLETE SPECIFICATION

FOR OFFICE USE

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Short Title:

Int. Cl:

Application Number:
Lodged:

Complete Specification-Lodged:
Accepted:
Lapsed:
Published:

Priority:

Related Art:

This document contains the
amendments made under
Section 49 and is correct for
printing.

TO BE COMPLETED BY APPLICANT

Name of Applicant: RITTAL-WERK RUDOLF LOH GMBH & CO.
KG.

Address of Applicant: Auf dem Stutzelberg, D-6348 Herborn,
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Complete Specification for the invention entitled:

SWITCH CABINET

The following statement is a full description of this invention,
including the best method of performing it known to me/us:-

9820A:rk

SWITCH CABINET

The invention relates to a switch cabinet with a frame made up of frame pieces which is closed in by means of a base, top and two side walls, and the open sides of which can be closed in by means of a cabinet door and a rear wall or by means of two cabinet doors, said frame pieces forming a hollow section which is provided with uniform rows of holes on the two vertical sides of the frame pieces facing the interior of the cabinet, and on one side of the frame pieces facing the exterior of the cabinet with a projecting jointing web.

A switch cabinet of this type is known from DE-PS 33 44 598. This frame of the switch cabinet has the advantage that it allows attachments to be built into the switch cabinet interior in all directions and that the base, top, side walls, rear wall and cabinet doors can be attached to the frame to form a tightly closed structure. The frame of the switch cabinet is composed of twelve frame pieces and consequently there is a large number of parts for the switch cabinet requiring a considerable assembly time.

The object of the invention is to structure the switch cabinet of the above mentioned type in such a manner as to considerably reduce the number of parts and assembly time required, whilst maintaining the universal capacity for adding attachments.

According to the present invention there is provided a switch cabinet comprising a frame made up of a base panel, a top panel, side face panels and open side faces which are arranged to be closed by means of a cabinet door and a rear wall or two cabinet doors, each panel having at least two opposing bent side walls, which each comprise a vertical first segment which at its distal end is bent into a second segment which extends perpendicular thereto to the outside of the cabinet to be formed, the distal end of the second segment being bent into a third segment which extends parallel to the second segment, past the first segment and



to the interior of the cabinet to be formed, the part of the third segment which extends past the first segment having a row of holes provided therein in the direction of the length of the bent side wall, the distal end of the third segment being bent into a fourth segment which extends towards the bottom of the panel and parallel to the first segment, and having a row of holes in the direction of the length of the bent side wall and aligned with the holes of the third segment.

The stability of the panels with edges bent in such a manner is enhanced simply by reinforcing the fourth segment of the side walls at its end by means of a fifth segment bent inwards at right angles to the first segment.

A preferred embodiment of the present invention will now be described with reference to the accompanying drawings, in which;

Figure 1 shows a first embodiment of the side walls of a panel, according to the present invention;

Figure 2 shows a second embodiment of the side walls of a panel;

Figure 3 shows a third embodiment of the side walls of a panel;

Figure 4 shows a fourth embodiment of the side walls of a panel;

Figure 5 shows the base, top and both side face panels which, after being joined together, form a cabinet unit for a switch cabinet open at the front and back;

Figure 6 shows a detailed view of the side walls of a side face panel and the base panel in a corner area of the cabinet according to Figure 5;

Figure 7 shows a detailed view in a corner area of an alternative structure for the base panel of a switch cabinet according to Figure 5;

Figure 8 shows a detailed view of the side walls of the vertical edges of the side face panel and all edges of the base panel in a corner area of the switch cabinet in an alternative embodiment;



Figure 9 shows the assembled corner section of the switch cabinet with the side face panel and base panel according to Figure 8;

Figure 10 shows a detailed view in a corner area of a housing composed of two side face panels and top panel and the adjoining separate side walls of a frame closing off the base panel, and

Figure 11 shows the assembled corner section of the switch cabinet according to Figure 10.

The number of parts and assembly time required for the switch cabinet is reduced by at least one section of the panels of the frame being bent at the base, top and/or the two side faces of the cabinet body. The multiple bending of the sidewalls of a panel is structured herein in such a way as to ensure that two perpendicular segments of the side walls are provided with rows of holes and that the jointing webs necessary for tight closure of the open sides are formed so that they project outwards.

Figures 1 to 4 show four embodiments for the side walls of the panels. Panel B in these examples can be the base, top or a side face. In all embodiments a first segment a is bent vertically to the inside of panel B. The end of the first segment a, passes into the second segment b, which projects on the outside of the first segment a, parallel to panel B and forms the jointing web together with the adjoining third segment c. The third segment c lies on the second segment b and extends beyond the first segment a. At the end of the third segment c, the fourth segment d is bent vertically towards the inside of panel B. The third segment c and the fourth segment d have holes 27 which are identical and aligned with one other. The distance of the row of holes 27 from the edge which is formed by the transitional areas from the third segment c to the fourth segment d is the same.

As Figure 2 shows, the panels and in particular the fourth segment d of the side walls can be reinforced by a fifth segment e which is bent towards the first segment a at the end of the fourth segment.

The side walls can form a closed hollow section as shown in Figure 3 if the fifth segment e is extended to the first section a and passes into a sixth section f at that point, which is parallel to the first segment a, abuts said first section a and is connected, preferably welded, to this segment. The sixth segment f is bent here towards the inside of panel B to provide better access for joining attachments.

Figure 4 shows a further embodiment for a closed hollow section of the side wall. In this case, the fourth segment d extends up to the inside of panel B and at that point passes into the vertically bent fifth segment e which is bent away from the first segment a. The fifth segment can then be easily joined to the inside panel B.

Figure 5 shows the base 10, top 12 and the two side faces 11 and 13, which make up the cabinet body of the switch cabinet. The front and rear sides of the cabinet body remain open. The frame is formed from frame pieces 14 to 25, each of which is formed from the edges of base 10, top 12 and side faces 11 and 13 by multiple bending of the type shown in Figures 1 to 4. Segments c and d with rows of holes 27 face the interior of the switch cabinet after the cabinet body has been assembled. In the embodiment according to Figure 5, frame pieces 14 and 18 are bent at the edges of base 10 facing the open sides of the cabinet body, whilst the edges of frame pieces 16 and 20 are bent in a single piece at the top wall 12. The two side faces 11 and 13 have bent frame pieces on all edges, as frame pieces 15, 19, 22 and 23 or 17, 21, 24 and 25 respectively show.

The base 10, top 12 and side faces 11 and 13 are joined together, preferably by welding, in the area where the edges abut. An opening may be punched into the base 10 through which cables may pass into the switch cabinet.

Figure 6 shows details of the side face 11 and the base 10 which form a corner of the cabinet body after assembly. The vertical edge of the side face 11 has a bent



frame piece 19, as shown in Figure 1. This frame piece 19 ends before the horizontal frame piece 22, at which point the first segment a passes directly into the third segment c with a row of holes 27. The upright fourth segment d with a row of holes 27 joins vertically onto the inside of the side wall 11. In the corner area, the first segment a of the frame pieces 19 and 22 continues in the form of bent edge pieces 32 and 33. So that base 10 may be simply joined to the facing edge of the side face 11, the edge piece 28 is bent inwards at this facing edge. Figure 6 shows the joint of the base 10 and the side wall 11 in the area of the bottom rear corner of the cabinet body. The other corner areas between base 10 and side walls 11 and 13 are structured in a similar manner, and the joints between the top and side walls 11 and 13 are also similar.

As figure 7 shows, the cabinet body can also be assembled with a base 10 and top 12 of different design. The side faces 11 and 13 are the same as those of the cabinet body shown in Figure 5. The base 10 is box-shaped and has bent edge pieces 29 and 30. The frame pieces 14 and 18 in the form of hollow section segments 31 complete the frame structure in the area of base 10.

Figure 8 shows a further embodiment of the cabinet body of the switch cabinet. The base 10 and top 12 have frame pieces 14, 18, 22 and 25 or 16, 20, 23 and 24 respectively formed at all their edges. The side faces 11 and 13 have bent frame pieces 15 and 19 or 17 and 21 respectively formed from the vertical edges only. As can be seen from the corner area of side face 11 and base 10 as shown in Figure 8, the frame pieces are bent on the vertical edges of the side faces 11 and 13 in accordance with Figures 1 to 4. The frame pieces end before the corner in this case to allow space for the frame piece of the base 10. The first segment a of the frame pieces is continued up to the corner in the form of edge piece 33. The horizontal edges of the side faces 11 and 13 have the bent edge piece 32. The frame pieces 22 and 25 of the base, which are facing the edge

piece 32 of the side faces 11 and 13, only bear the third and fourth segments c and d of the bent edge profile with a row of holes 27. After assembly, the frame pieces complete the frame structure, as shown in Figure 9 in the corner section by the converging frame pieces 18, 19 and 22. In this case, the base 10, top 12, and side walls 11 and 13 are preferably joined to the cabinet body by welds on all abutting points.

Figures 10 and 11 show a further embodiment, in which the side faces 11 and 13 may correspond to the side faces 11 and 13 of Figure 8. However, side faces 11 and 13 can also be bent from a blank to form a U-shaped housing in which frame pieces according to Figures 1 - 4 are bent at the edges facing the open sides of the cabinet body.

To complete the frame structure, a frame made up of four hollow section segments 34 and 35 closes in the cabinet body. The frame pieces have segments c and d with rows of holes 27 and may have side walls to support a base panel. Frame pieces structured on the inside in the form of hollow section segments, are welded onto the bent sections between the top 12 and side faces 11 and 13 to ensure that attachments may still be added at any point, even in the area of the top, 12.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A switch cabinet comprising a frame made up of a base panel, a top panel, side face panels and open side faces which are arranged to be closed by means of a cabinet door and a rear wall or two cabinet doors, each panel having at least two opposing bent side walls, which each comprise a vertical first segment which at its distal end is bent into a second segment which extends perpendicular thereto to the outside of the cabinet to be formed, the distal end of the second segment being bent into a third segment which extends parallel to the second segment, past the first segment and to the interior of the cabinet to be formed, the part of the third segment which extends past the first segment having a row of holes provided therein in the direction of the length of the bent side wall, the distal end of the third segment being bent into a fourth segment which extends towards the bottom of the panel and parallel to the first segment, and having a row of holes in the direction of the length of the bent side wall and aligned with the holes of the third segment.

2. A switch cabinet according to Claim 1, characterized in that the rows of holes in the third and fourth segments of each bent side wall are at the same distance from the edge which is formed by the transitional area from the third segment to the fourth segment.

3. A switch cabinet according to Claim 1 or 2, characterised in that the fourth segment of each bent side wall is reinforced at its distal end by a fifth segment bent perpendicular to the fourth segment and inward to the first segment.

4. A switch cabinet according to Claim 3, characterised in that the fifth segment extends up to the first segment and is then bent into a sixth segment parallel to the first segment in abutting relationship therewith.

5. A switch cabinet according to Claim 4, characterized in that the sixth segment is bent at the distal end of the fifth segment away from the third segment.

6. A switch cabinet according to Claim 1 or 2, characterized in that the fourth segment extends up to the inside of the panel and its distal end is bent into a fifth segment which runs parallel to and abuts the base of the panel and is connected thereto

7. A switch cabinet according to Claim 6, characterized in that the fifth segment is bent, where it abuts the base of the panel, away from the first segment.

8. A switch cabinet according to any one of Claims 1-7, wherein on the base panel and the top panel of the frame only the side walls of the panels facing the open side faces are bent, whereas on the other faces the panels are bent on all side walls.

9. A switch cabinet according to Claim 8, characterised in that on the side walls of the base and top panels the side walls facing the open side faces each have an edge piece bent to the inside of the cabinet to be formed.

10. A switch cabinet according to any one of claims 1-7, wherein the base panel and top panel each have four bent side walls and the side faces have bent side walls only on those side walls which are arranged to be adjacent open side faces.

11. A switch cabinet according to any one of the preceding claims, wherein the side walls of the side face panels comprise end portions which extend upwardly perpendicular to the base of the panel.

12. A switch cabinet according to Claim 11, wherein the end portions form a hollow section which is arranged to be connected with an end portion of a side wall of either a base or top panel.



13. A switch cabinet according to Claim 10, 11 or 12, wherein the side walls of the base panel and the top panel comprise end portions which are in the form of an upstanding wall perpendicular to the panel bottom.

5 14. Switch cabinet substantially as described herein in conjunction with any one of Figures 1 to 4, or Figures 5 to 7, or Figures 8 and 9 or Figures 10 and 11.

10 Dated this 25th day of June, 1990

15 RITTAL-WERK RUDOLF LOH GmbH & CO. KG

By their Patent Attorneys

20 GRIFFITH HACK & CO.

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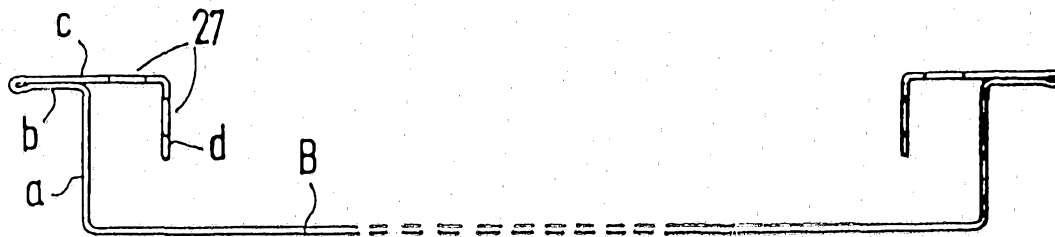


FIG. 1

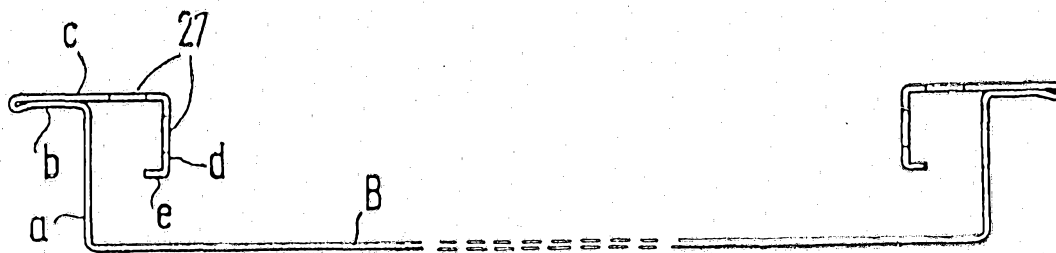


FIG. 2

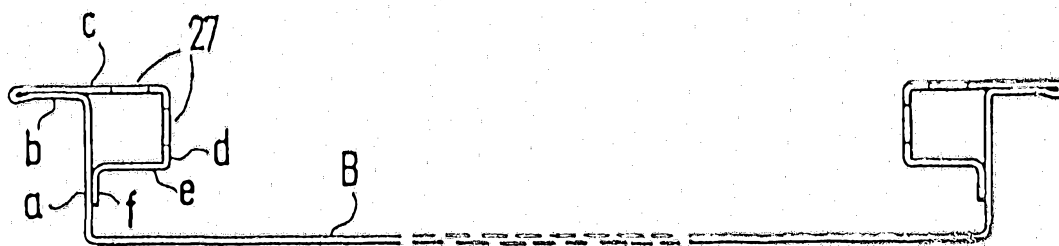


FIG. 3

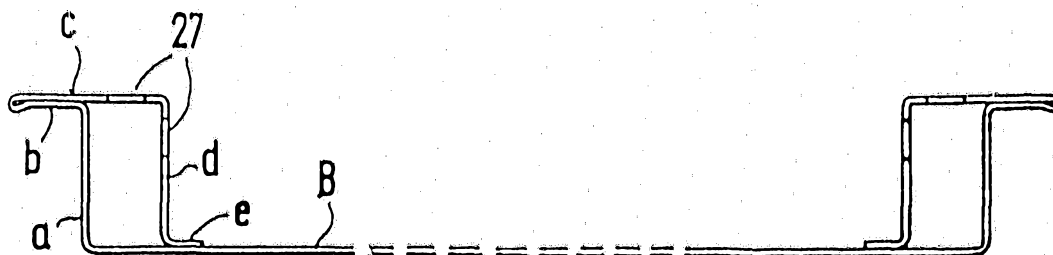


FIG. 4

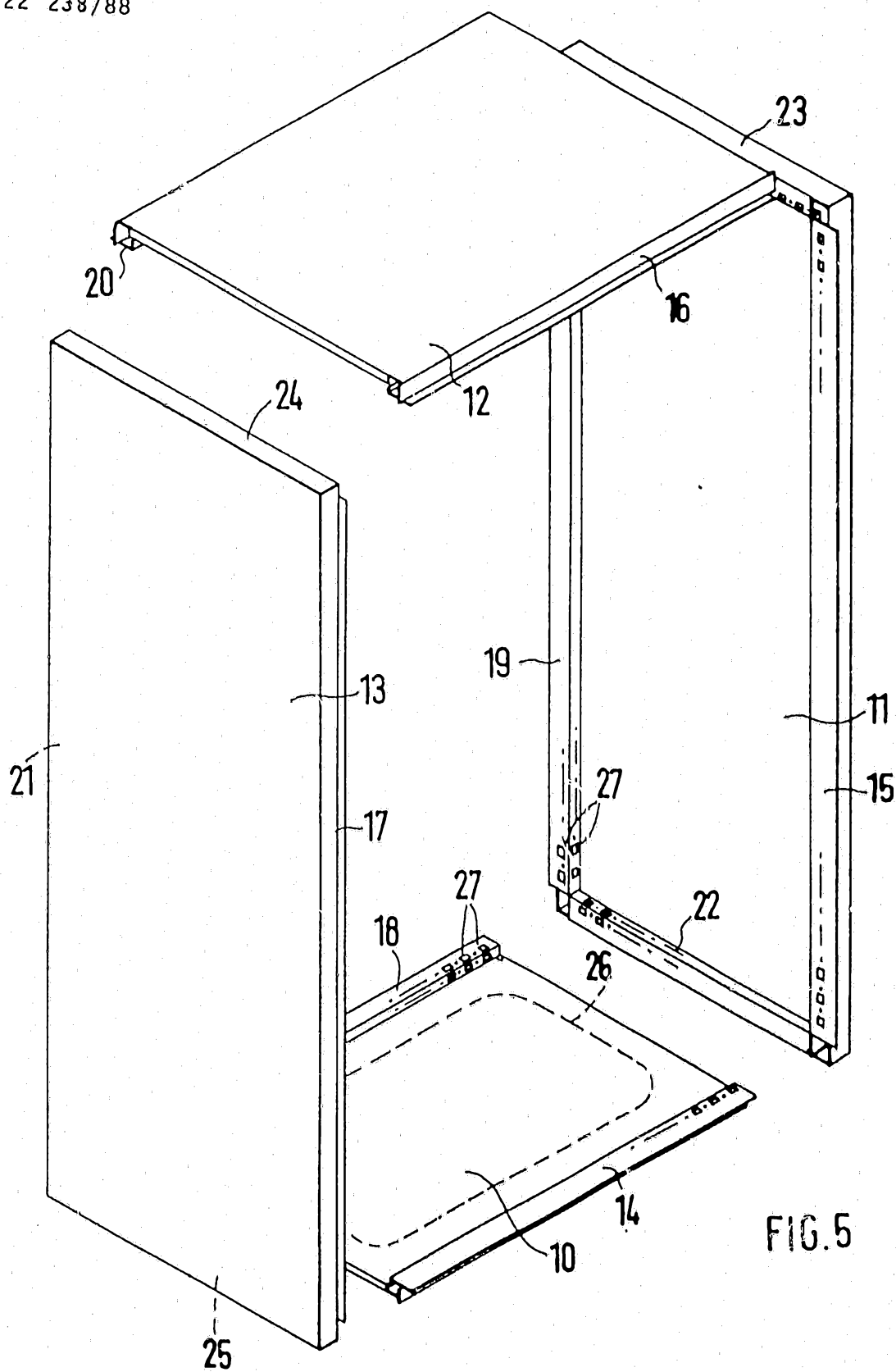


FIG. 5

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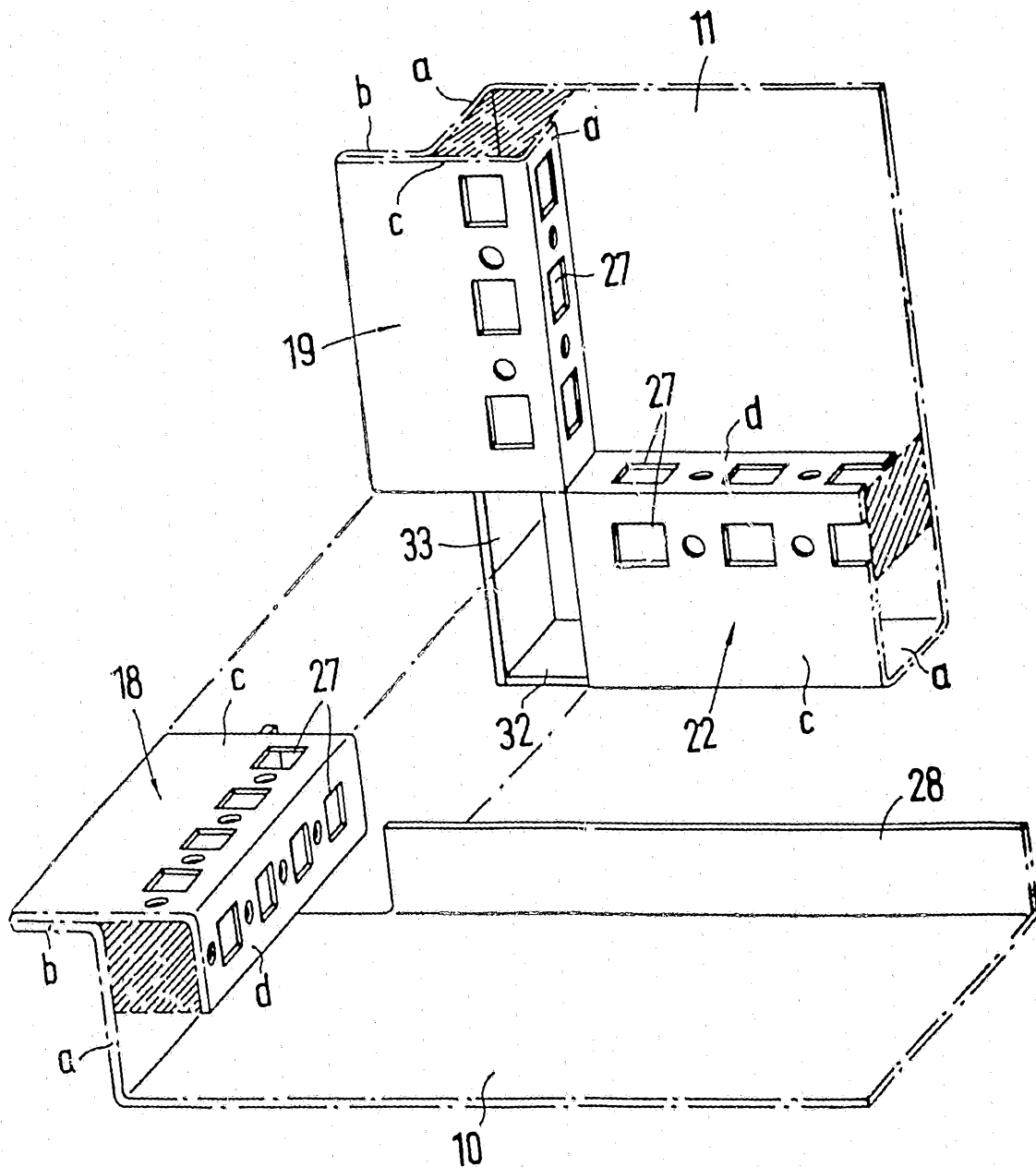


FIG. 6

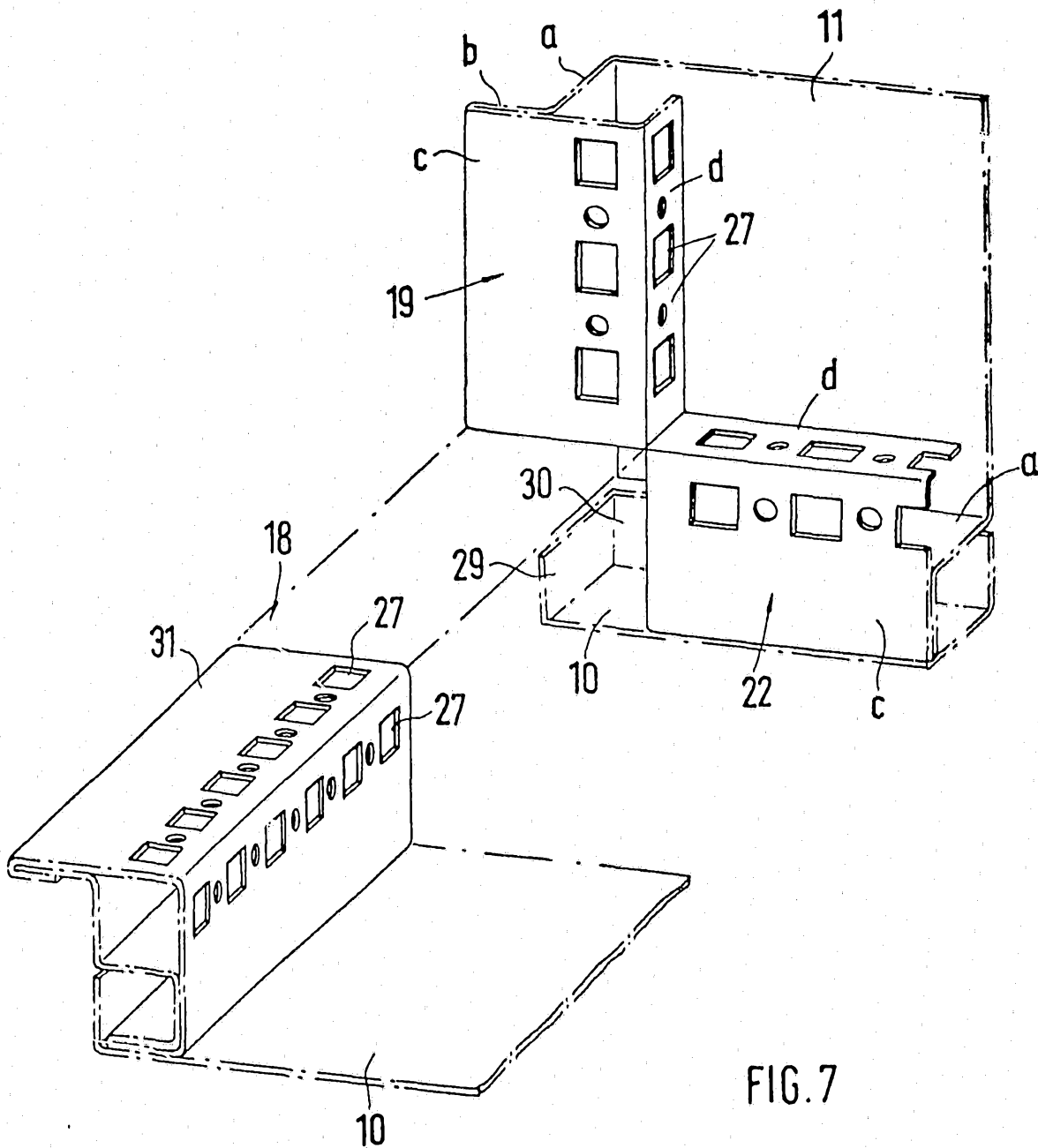


FIG. 7

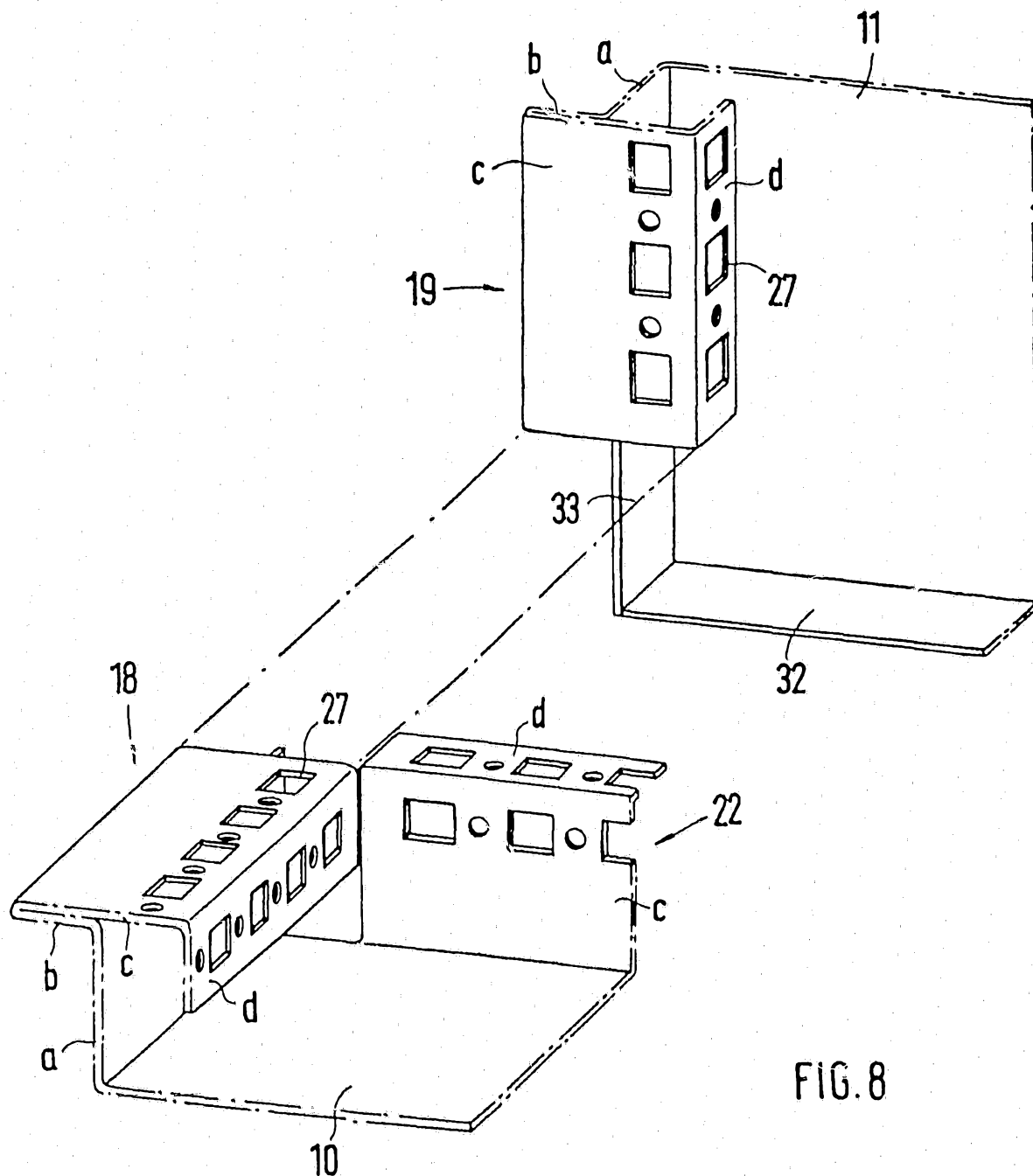
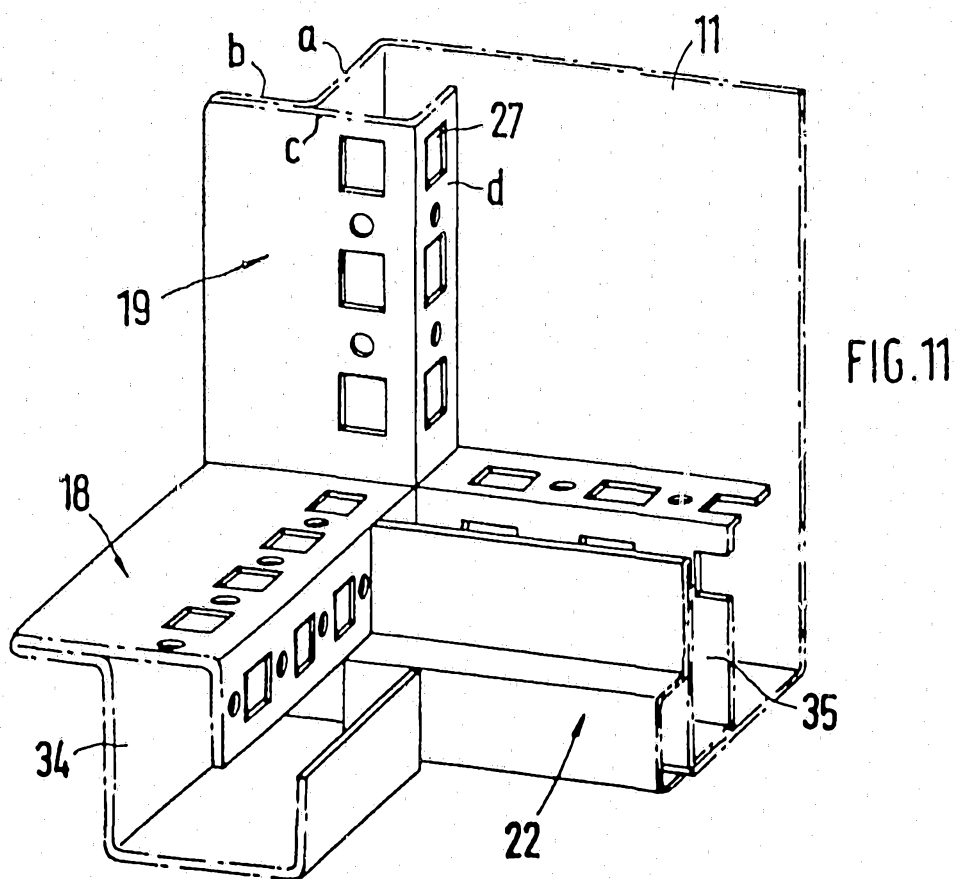
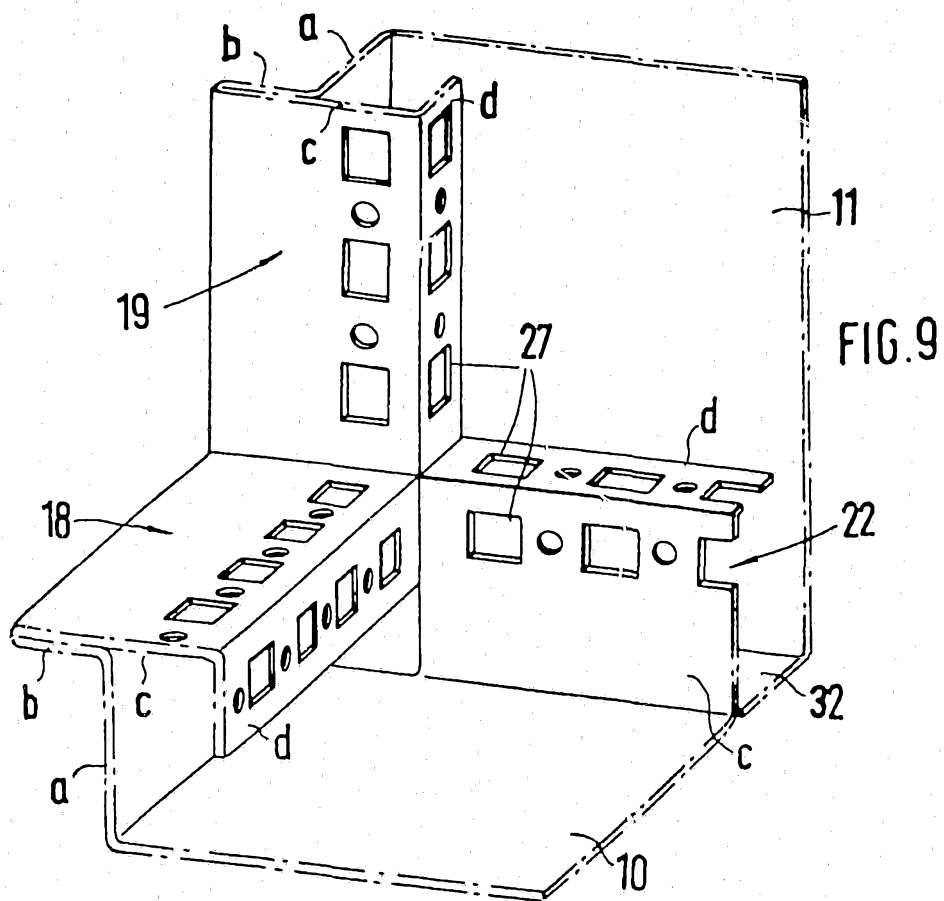


FIG. 8



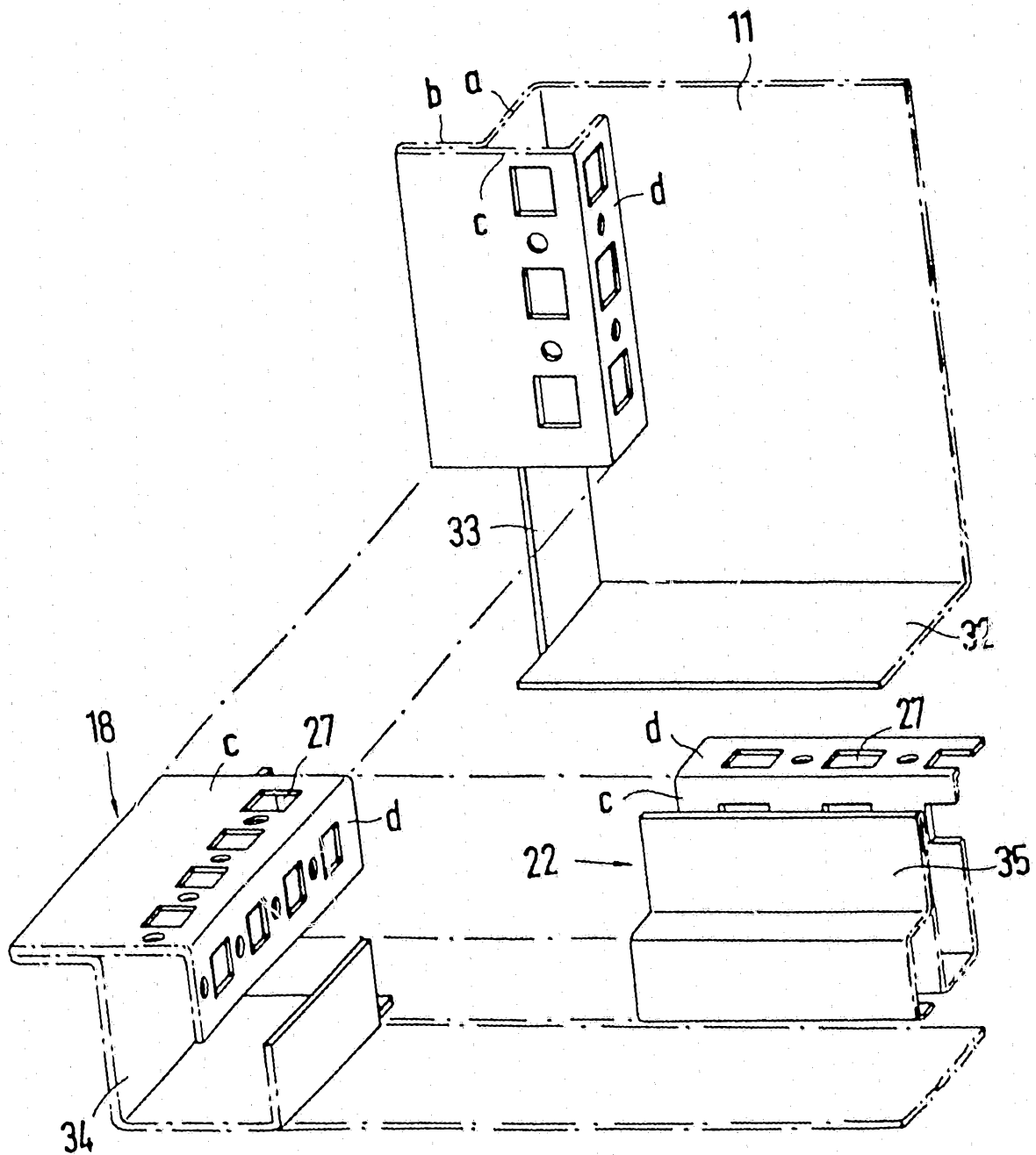


FIG. 10