(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 581 485 B2**

(12) **NEW EUROPEAN PATENT SPECIFICATION**
After opposition procedure

(45) Date of publication and mention of the opposition decision:
22.05.2024 Bulletin 2024/21

(45) Mention of the grant of the patent:
11.06.2014 Bulletin 2014/24

(21) Application number: **11185162.2**

(22) Date of filing: **14.10.2011**

(51) International Patent Classification (IPC):
D06F 39/00 *(2024.01)* ***A47L 15/42*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
D06F 34/34; A47L 15/4293

(54) A method for assembling a front panel for a domestic appliance and a corresponding front panel

Verfahren zur Montage der Frontplatte eines Haushaltsgerätes und entsprechende Frontplatte

Procédé d'assemblage d'un panneau frontal pour appareil domestique et panneau frontal correspondant

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(43) Date of publication of application:
17.04.2013 Bulletin 2013/16

(73) Proprietor: **Electrolux Home Products Corporation N.V.**
1130 Brussels (BE)

(72) Inventors:
- **Winkelmann, Klaus**
  91541 Rothenburg o. d. Tauber (DE)
- **Michel, Herbert**
  91541 Rothenburg o. d. Tauber (DE)
- **Feser, Jürgen**
  91541 Rothenburg o. d. Tauber (DE)
- **Löwe, Christina**
  91541 Rothenburg o. d. Tauber (DE)
- **Pursche, Thomas**
  91541 Rothenburg o. d. Tauber (DE)

(74) Representative: **Schröer, Gernot H. et al**
Meissner Bolte Patentanwälte
Rechtsanwälte Partnerschaft mbB
Bankgasse 3
90402 Nürnberg (DE)

(56) References cited:

EP-A1- 1 990 698
EP-A2- 1 639 935
DE-A1-102005 024 934
DE-U1- 20 111 406
DE-U1- 29 610 047
FR-A3- 2 572 501
JP-A- 2007 078 296
US-A- 5 584 563
US-A- 6 018 153
US-B2- 6 515 266

- **Whirlpool, "Whirlpool built-in catalogue of 2009-2010", April 2009**
- **Drawing 4619 602 8307 2**
- **Drawing 7819 160 40 631**
- **Drawing 7819 160 40 101**
- **Drawing 7819 160 41 841**
- **Bill of Material (BOM) of the oven AKZM 655/IX**
- **"Whirlpool et Vous!" - Whirlpool publication of summer 2010 from Internet link http://www.photos-whirlpool.com/site08/wh/logos-amb/newsletter.pdf**
- **EWM 176 FR - Early Warning Message (EWM) form**
- **Whirlpool Invoice Nr. 3971963463 dated 30.09.2010 to Poliform SpA**
- **Signed declaration of the President of Whirlpool Europe, Mrs. Esther Berrozpe**
- **Printout of the internet website:http://www.ciao.fnWhirlpool AKZM 751 IX 1769569**
- **Affidavit signed by Mr. Marco Giuliani dated 23.07.2021**
- **Affidavit signed by Mr. Marco Giuliani dated 11.11 2022**
- **Bill of Material (BOM) of the oven AKZM 654/IX**
- **Drawing number 4619-602-83621 dated 11.07.08**
- **Drawing number 78191604098 dated 28.10 08**
- **Drawing number 78191604200 dated 31.10.08**
- **List of invoices relating sale of AKZM 654/IX**
- **Invoice 3971792283 to ADRIANO FRESCHI SRL, dated 25.02.2009**
- **Invoice 3971798787 to INSERLINEA GROBINOX SRL, dated 21.03.2009**
- **Invoice 3971805513 to GM CUCINE SRL, dated 14.04.2009**

Processed by Luminess, 75001 PARIS (FR)

(Cont. next page)

- Invoice 3971818752 to INSERLINEA GROBINOX SRL, dated 28.05 2009
- Invoice 3971822858 to A.B. INOX SRL, dated 10 06.2009
- Invoice 3971826927 to ESSEBI SRL, dated 25.06.2009
- Invoice 3971826927 to SBABO CUCINE SRL, dated 27.06.2009
- Invoice 3971833430 to MONTAGNA FABIO, dated 17.07.2009
- Invoice 4471731228 to P J. HOPKINSON, dated 14.07.2009
- Invoice 3971835309 to FEG IND.MOB DI R E &CSAS-DIV.CUCINE, dated18.07.2009
- EP2581485 opposition proceedings - Analysis of the amendments made to the independent claims

Description

[0001] The present invention relates to a method for assembling a front panel for a domestic appliance. Further, the present invention relates to a corresponding front panel for a domestic appliance, wherein said front panel comprises a decorative cover made of one or more at least partially transparent materials, a support plate with at least one cutout corresponding with said decorative cover and at least one holding device.

[0002] The front panel for a domestic appliance includes several components. A decorative cover made of glass or another transparent material forms the foremost part of the front panel. A support plate made of a metal sheet of plastics form the central part of the front panel. One or more holding devices are provided for receiving control elements and/or display devices. The holding devices form the rear and/or inner parts of the front panel.

[0003] The assembling of the components for the front panel requires several steps. A number of fasteners are necessary for connecting the components of the front panel. Usually, the neighbouring components of the front panel are connected by fasteners. The connection to the next components is made by further fasteners.

[0004] DE 10 2005 024 934 A1 discloses an operation panel assembly for a domestic appliance. The operation panel assembly comprises a base body, a transparent cover and an information carrier. The information carrier includes graphical elements and consists of at least two carrier elements. Each carrier element includes graphical elements, so that the composed carrier elements represent a combination of graphical elements. Preferably, the carrier elements are transparent plastic films printed by said graphical elements. Two large-area sides the transparent plastic films are adjacent. The carrier elements are arranged between the base body and the transparent cover.

[0005] It is an object of the present invention to provide a method for assembling a front panel for a domestic appliance and a corresponding front panel, wherein the number of assembling steps is reduced.

[0006] The object of the present invention is achieved by the method according to claim 1.

[0007] The present invention relates to a method for assembling a front panel for a domestic appliance, wherein said method comprises the following steps:

providing a decorative cover made of one or more at least partially transparent materials,
providing a support plate with a rectangular cutout arranged in the central portion of the support plate which is marginally smaller than the decorative cover,
providing at least one holding device for receiving control elements and/or display devices,
applying a glue bead onto a rear side of the decorative cover,
attaching the support plate onto the rear side of the decorative cover, and attaching the holding device onto the glue bead,
so that the glue bead is at least partially covered by the support plate and the holding device,
wherein the support plate and the holding device are directly fixed on the decorative cover by said glue bead.

[0008] The main idea of the present invention is that one glue bead allows the connection between three substantial components of the front panel. The glue bead is applied onto the rear side of the decorative cover. The support plate and one or more holding devices are directly fixed on the decorative cover by said glue bead.

[0009] In particular, the provided support plate comprises an embossing enclosing at least partially the cutout of said support plate or an embossing is prepared along the circumference of the cutout of the support plate, wherein the embossing is displaced rearwards.

[0010] Further, the volume of the glue bead is defined by the embossing. Tolerances of the embossing and/or the support plate can be compensated by a variable thickness of the glue bead. Also distorted support plates, which cannot be used for a conventional assembling method, are suitable for the inventive assembling method.

[0011] Preferably, the embossing includes a plurality of holes or a plurality of holes is prepared in the embossing, so that a part of the glue bead swells through said holes during attaching the support plate onto the rear side of the decorative cover. The holes allow that the glue bead is divided into two glue beads on the opposite sides of the embossing. One application of the glue bead results in two glue beads by the holes.

[0012] According to a further embodiment of the present invention the glue bead is prepared with a number of contractions in order to obtain a number of places for glue dots, and the holding device is prefixed onto the rear side of the support plate by said glue dots.

[0013] With the contractions the holding device may be attached onto the rear side of the support plate by glue dots, wherein said glue dots are joined behind the positions of the contractions. In this case the holding device may comprise corresponding holes.

[0014] According to another embodiment of the present invention the support plate is fixed by gluing the holding device onto the decorative cover.

[0015] Further, the support plate and/or the holding device are centred and/or aligned during attaching the support plate and/or the holding device, respectively. The attaching and centring of the support plate and/or holding device may be performed within one step in each case.

[0016] The object of the present invention is further achieved by the front panel according to claim 7.

[0017] The present invention relates to a front panel for a domestic appliance, wherein: the front panel comprises a decorative cover made of one or more at least partially transparent materials,

the front panel comprises a support plate with a rectangular cutout arranged in the central portion of the support plate which is marginally smaller than the decorative cover,
the front panel comprises at least one holding device for receiving control elements and/or display devices,
a glue bead is applied on a rear side of the decorative cover,
the support plate is attached on the rear side of the decorative cover, and the holding device is attached on the glue bead,
so that the glue bead is at least partially covered by said support plate and the holding device,
wherein the support plate and the holding device are directly fixed on the decorative cover by said glue bead.

[0018] The inventive front panel requires one glue bead for the connection between at least three substantial components of the front panel. The glue bead is applied onto the rear side of the decorative cover. The support plate and one or more holding devices are directly fixed on the decorative cover by said glue bead.

[0019] In particular, the support plate comprises an embossing enclosing at least partially the cutout of said support plate, wherein the embossing is displaced rearwards.

[0020] Further, the volume of the glue bead is defined by the embossing. Tolerances of the embossing and/or the support plate are compensated by a variable thickness of the glue bead. The front panel may be made of a distorted support plate, which cannot be used for a conventional assembling method.

[0021] The embossing may include a plurality of holes, so that a part of the glue bead penetrates through said holes. The holes divide the original glue bead into two glue beads on the opposite sides of the embossing.

[0022] The glue bead may comprise a number of contractions, so that a number of places for glue dots is obtained, and the holding device may be prefixed on the rear side of the support plate by said glue dots.

[0023] Preferably, the decorative cover is the foremost component of the front panel. In this case, the side walls of the decorative cover may be illuminated or illuminable for display and/or design purposes.

[0024] Novel and inventive features of the present invention are set forth in the appended claims.

[0025] The present invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates a rear view of a decorative cover for a front panel according to a first embodiment, the embodiment being a first example,
FIG 2 illustrates a rear view of a support plate with the decorative cover for the front panel according to the first example,
FIG 3 illustrates a rear view of the support plate with the decorative cover for the front panel according to the first example,
FIG 4 illustrates a rear view of the support plate with the decorative cover and a holding frame and knob housings for the front panel according to the first example,
FIG 5 illustrates a sectional side view of the support plate with the decorative cover and the holding frame for the front panel according to the first example,
FIG 6 illustrates a rear view of the decorative cover for the front panel according to a second embodiment of the present invention,
FIG 7 illustrates a rear view of the support plate with the decorative cover for the front panel according to the second embodiment of the present invention,
FIG 8 illustrates a rear view of the support plate with the decorative cover and the holding frame for the front panel according to the second embodiment of the present invention,
FIG 9 illustrates a rear view of the decorative cover for the front panel according to a third embodiment of the present invention,
FIG 10 illustrates a rear view of the support plate with the decorative cover for the front panel according to the third embodiment of the present invention,
FIG 11 illustrates a rear view of the support plate with the decorative cover and the holding frame for the front panel according to the third embodiment of the present invention,
FIG 12 illustrates a rear view of the decorative cover and the support plate for the front panel according to a fourth embodiment, the embodiment being a second example,
FIG 13 illustrates a rear view of the decorative cover and the support plate with a glue bead for the front panel according to the second example,
FIG 14 illustrates a perspective front view of the knob housing for the front panel according to the second example,
FIG 15 illustrates a perspective front view of the holding frame for the front panel according to the second example,
FIG 16 illustrates a rear view of the support plate with the decorative cover and the holding frame for the second example,
FIG 17 illustrates a sectional side view of the support plate with the decorative cover and the knob housing for the front panel according to the second example,
FIG 18 illustrates a sectional side view of the support plate with the decorative cover and the holding frame for the front panel according to the second example,
FIG 19 illustrates a perspective front view of the support plate for the front panel according to a fifth embodiment of the present invention,
FIG 20 illustrates a perspective front view of the support plate with the holding frame and knob housings for the front panel according to the fifth embodiment of the present invention,

FIG 21 illustrates a perspective rear view of the support plate with the holding frame and knob housings for the front panel according to the fifth embodiment of the present invention,

FIG 22 illustrates a rear view of a decorative cover for the front panel according to the fifth embodiment of the present invention,

FIG 23 illustrates a sectional side view of the support plate with the decorative cover and the holding frame for the front panel according to the fifth embodiment of the present invention,

FIG 24 illustrates a perspective front view of the knob housing for the front panel according to the fifth embodiment of the present invention,

FIG 25 illustrates a perspective front view of the holding frame for the front panel according to the fifth embodiment of the present invention, and

FIG 26 illustrates a partial sectional side view of the support plate with the decorative cover and the holding frame for the front panel according to the fifth embodiment of the present invention.

The first example and the second example, as a whole, are not covered by the present invention.

[0026] FIG 1 illustrates a rear view of a decorative cover 10 for a front panel according to a first example. The front panel is provided for a domestic appliance.

[0027] The decorative cover 10 is formed as a rectangular sheet and comprises four round holes 24. The round holes 24 are provided for receiving knobs or shafts of said knobs. In this example, the decorative cover 10 is made of glass. Alternatively, the decorative cover 10 may be made of plastics.

[0028] A glue bead 18 is applied at an outer portion of the rear side of the decorative cover 10. The glue bead 18 has the form of a rectangular frame.

[0029] The application of the glue bead 18 onto the decorative cover 10 is the first step of assembling the front panel of the first example.

[0030] FIG 2 illustrates a rear view of a support plate 12 with the decorative cover 10 for the front panel according to the first example.

[0031] The support plate 12 is substantially formed as a rectangular sheet. A rectangular cutout is arranged in the central portion of the support plate 12. Said rectangular cutout is marginally smaller than the decorative cover 10 attached at the front side of the support plate 12. The rectangular cutout is enclosed by an embossing 22. The embossing 22 is provided for receiving the glue bead 18 of the decorative cover 10. The deepness of the embossing 22 defines the thickness of the glue bead 18 between the rear side of the decorative cover 10 and the front side of the support plate 12.

[0032] The assembly of the support plate 12 and the decorative cover 10 is the second step of assembling the front panel of the first example.

[0033] FIG 3 illustrates a rear view of the support plate 12 with the decorative cover 10 for the front panel according to the first example of the present invention. FIG 3 shows the same support plate 12 and the same decorative cover 10 as in FIG 2.

[0034] Additionally, a further glue bead 20 is arranged on the rear side of the support plate 12. The glue bead 20 has the form of a rectangular frame and two transverse joints 26. The rectangular frame of the glue bead 20 has substantially the same size as the rectangular frame of the glue bead 18.

[0035] The applying of the glue bead 20 onto the support plate 12 is the third step of assembling the front panel of the first example.

[0036] FIG 4 illustrates a rear view of the support plate 12 with the decorative cover 10 and a holding frame 16 for the front panel according to the first example.

[0037] The holding frame 16 is attached in a central portion of the rear side of the support plate 12. The holding frame 16 is fixed by the glue bead 20. Four knob housings 14 are also attached at the rear side of the support plate 12. Two knob housings 14 are arranged side-by-side on the left and right sides of the holding frame 16 in each case. Each knob housing 14 corresponds with one of the round holes 24 of the decorative cover 10. The knob housings 14 are also fixed by the glue bead 20.

[0038] The fixing of the holding frame 16 and the knob housings 14 at the support plate 12 is the fourth step of assembling the front panel of the first example.

[0039] FIG 5 illustrates a sectional side view of the support plate 12 with the decorative cover 10 and the holding frame 16 for the front panel according to the first example. FIG 5 clarifies the arrangement of the decorative cover 10, the support plate 12, the holding frame 16 and the glue beads 18 and 20.

[0040] The decorative cover 10 is the foremost component of the front panel. The glue bead 18 between the decorative cover 10 and the support plate 12 is arranged in a space provided by the embossing 22. Thus, the decorative cover 10 lies directly against the support plate 12. The glue bead 20 between the support plate 12 and the holding frame 16 is arranged at rear side of the embossing 22 and opposite to the glue bead 18.

[0041] FIG 6 illustrates a rear view of the decorative cover 10 for the front panel according to a second embodiment of the present invention. Same and similar components have the same reference numerals as in the first example.

[0042] The decorative cover 10 is formed as a rectangular sheet and comprises the four round holes 24. The round holes 24 are provided for receiving the knobs or the shafts of said knobs.

[0043] The glue bead 18 is applied at an outer portion of the rear side of the decorative cover 10. The glue bead 18 has the form of a rectangular frame. Additionally, the glue bead 18 comprises six transverse joints 26, so that the round holes 24 are enclosed by the glue bead 18.

[0044] The application of the glue bead 18 onto the decorative cover 10 is the first step of assembling the

front panel of the second embodiment.

[0045] FIG 7 illustrates a rear view of the support plate 12 with the decorative cover 10 for the front panel according to the second embodiment of the present invention.

[0046] The support plate 12 of the second embodiment is similarly formed as the support plate 12 of the first example. Additionally, the embossing 22 comprises a plurality of holes 28. A part of the glue bead 18 expands through said holes 28, when the support plate 12 is put onto the decorative cover 10. The deepness of the embossing 22 defines the thickness of the glue bead 18 between the rear side of the decorative cover 10 and the front side of the support plate 12. That part of the glue bead 18 expanded through the holes 28 forms the glue bead 20 on the rear side of the support plate 12.

[0047] The assembly of the support plate 12 and the decorative cover 10 is the second step of assembling the front panel of the second embodiment.

[0048] FIG 8 illustrates a rear view of the support plate 12 with the decorative cover 10 and the holding frame 16 for the front panel according to the second embodiment of the present invention.

[0049] The holding frame 16 and the four knob housings 14 are attached at the rear side of the support plate 12 in a similar way as in the first example. However, the glue bead 20 between the support plate 12 on the one hand and the holding frame 16 and four knob housings 14 on the other hand is formed by the expansion of the glue bead 18 through the holes 28.

[0050] The fixing of the holding frame 16 and the knob housings 14 at the support plate 12 is the third step of assembling the front panel of the second embodiment.

[0051] FIG 9 illustrates a rear view of the decorative cover 10 for the front panel according to a third embodiment of the present invention.

[0052] The glue bead 18 is applied at an outer portion of the rear side of the decorative cover 10 and has the form of a rectangular frame. Further, the glue bead 18 comprises the six transverse joints 26, so that the round holes 24 are enclosed by the glue bead 18 as in the second embodiment. Additionally, the glue bead 18 comprises a number of contractions 30 in its upper and lower parts. Said contractions 30 are provided in order to obtain places for glue dots.

[0053] The application of the glue bead 18 onto the decorative cover 10 is the first step of assembling the front panel of the third embodiment.

[0054] FIG 10 illustrates a rear view of the support plate 12 with the decorative cover 10 for the front panel according to the third embodiment of the present invention.

[0055] The support plate 12 of the third embodiment has the same form as the support plate 12 of the second embodiment. When the support plate 12 is put onto the decorative cover 10, then a part of the glue bead 18 expands through the holes 28 in the embossing 22, except at the positions of the contractions 30 of the glue bead 18. The deepness of the embossing 22 defines the thickness of the glue bead 18 between the rear side of the decorative cover 10 and the front side of the support plate 12. The positions of the contractions 30 are provided for gluing dots of hot glue or UV glue.

[0056] The assembly of the support plate 12 and the decorative cover 10 is the second step of assembling the front panel of the third embodiment.

[0057] FIG 11 illustrates a rear view of the support plate 12 with the decorative cover 10 and the holding frame for the front panel according to the third embodiment of the present invention.

[0058] The holding frame 16 and the four knob housings 14 are attached at the rear side of the support plate 12 in a similar way as in the second embodiment. Now the glue dots of hot glue or UV glue are set at the positions of the contractions 30. The holding frame 16 and the knob housings 14 are hold for a few seconds up to the glue of the gluing dots is hardened. In this way, a bending of the parts can be compensated. Thus, the assembly can be handled directly after the gluing process, since the holding frame 16 and the knob housings 14 are prefixed.

[0059] The fixing of the holding frame 16 and the knob housings 14 at the support plate 12 is the third step of assembling the front panel of the third embodiment.

[0060] FIG 12 illustrates a rear view of the decorative cover 10 and the support plate 12 for the front panel according to a second example.

[0061] In this example the support plate 12 is put onto the decorative cover 10. This is the first step of assembling the front panel of the second example.

[0062] FIG 13 illustrates a rear view of the decorative cover 10 and the support plate 12 with a glue bead 32 the front panel according to the second example.

[0063] In a second step of the second example the glue bead 32 is applied onto the decorative cover 10. The glue bead 32 has the form of a rectangular frame. The glue bead 32 is inside the rectangular cutout of the support plate 12.

[0064] FIG 14 illustrates a perspective front view of the knob housing 14 for the front panel according to the second example.

[0065] Contact surfaces 34 and distance elements 36 are arranged at the front side of the knob housing 14. The contact surfaces 34 are arranged in lines at the upper and lower end portions of the front side, respectively. The distance elements 36 are arranged between the upper and lower lines of the contact surfaces 34. The contact surfaces 34 are provided to lie against the rear side of the support plate 12. The distance elements 36 are provided to lie against the rear side of the decorative cover 10.

[0066] FIG 15 illustrates a perspective front view of the holding frame 16 for the front panel according to the second example.

[0067] Contact surfaces 38 and distance elements 40 are arranged also at the front side of the holding frame 16. The longitudinal contact surfaces 38 form the upper and lower end portions of the front side, respectively. The

distance elements 40 are arranged between the upper and lower contact surfaces 38. The contact surfaces 38 are provided to lie against the rear side of the support plate 12. The distance elements 40 are provided to lie against the rear side of the decorative cover 10.

[0068] FIG 16 illustrates a rear view of the support plate 12 with the decorative cover 10 and the holding frame 16 for the front panel according to the second example.

[0069] The holding frame 16 is attached in a central portion of the rear side of the support plate 12. The holding frame 16 is fixed at the decorative cover 10 by the glue bead 32. Thus, the support plate 12 is clamped between the decorative cover 10 and the holding frame 16.

[0070] The four knob housings 14 are also attached at the rear side of the support plate 12. The knob housings 14 are also fixed at the decorative cover 10 by the glue bead 32. Thus, the support plate 12 is clamped between the decorative cover 10 on the one hand and four knob housings 14 on the other hand.

[0071] The fixing of the holding frame 16 and the knob housings 14 at the support plate 12 is the third step of assembling the front panel of the second example.

[0072] FIG 17 illustrates a sectional side view of the support plate 12 with the decorative cover 10 and the knob housing 14 for the front panel according to the second example. FIG 17 clarifies the arrangement of the decorative cover 10, the support plate 12, the knob housing 14 and the glue bead 32.

[0073] The decorative cover 10 is the foremost component of the front panel. The glue bead 32 between the decorative cover 10 and the knob housing 14 is arranged in a space provided by the distance elements 36. The support plate 12 is clamped between the decorative cover 10 on the one hand and four knob housings 14 on the other hand.

[0074] FIG 18 illustrates a sectional side view of the support plate 12 with the decorative cover 10 and the holding frame 16 for the front panel according to the second example. FIG 18 clarifies the arrangement of the decorative cover 10, the support plate 12, the holding frame 16 and the glue bead 32.

[0075] The decorative cover 10 is the foremost component of the front panel. The glue bead 32 between the decorative cover 10 and the holding frame 16 is arranged in a space provided by the distance elements 40. The support plate 12 is clamped between the decorative cover 10 and the holding frame 16.

[0076] FIG 19 illustrates a perspective front view of the support plate 12 for the front panel according to a fifth embodiment of the present invention.

[0077] The support plate 12 includes a first embossing 42 at the upper and lower side of the cutout. The first embossing 42 is provided for receiving the holding frame 16 and the knob housings 14. The first embossing 42 comprises a number of centring elements 46. Further, the support plate 12 includes a second embossing 44 enclosing the cutout. The second embossing 44 is provided for receiving the glue bead 18.

[0078] FIG 20 illustrates a perspective front view of the support plate 12 with the holding frame 16 and the four knob housings 14 for the front panel according to the fifth embodiment of the present invention. The holding frame 16 and the four knob housings 14 are inserted in the cutout of the support plate 12.

[0079] FIG 21 illustrates a perspective rear view of the support plate 12 with the holding frame 16 and the four knob housings 14 for the front panel according to the fifth embodiment of the present invention. The holding frame 16 and the knob housings 14 include hooks 48.

[0080] The holding frame 16 and the knob housings 14 are inserted into the support plat 12, so that the contact surfaces 34 and 38 of the holding frame 16 and knob housings 14, respectively, contact the first embossing 42. The hooks 48 are provided for a pre-fixing the holding frame 16 and the knob housings 14. The glue bead 18 is applied onto the decorative cover 10. The support plate 12 with the holding frame 16 and the knob housings 14 is set downwards. The hooks 48 prevent that the holding frame 16 and the knob housings 14 get out of the support plate 12.

[0081] FIG 22 illustrates a rear view of the decorative cover 10 for the front panel according to the fifth embodiment of the present invention. The decorative cover 10 is formed as a rectangular sheet and comprises the four round holes 24.

[0082] The glue bead 18 is applied at the outer portion of the rear side of the decorative cover 10. The glue bead 18 has the form of a rectangular frame. Additionally, the glue bead 18 comprises six transverse joints 26, so that the round holes 24 are enclosed by the glue bead 18.

[0083] FIG 23 illustrates a sectional side view of the support plate 12 with the decorative cover 10 and the holding frame 16 for the front panel according to the fifth embodiment of the present invention. FIG 23 clarifies the structure of the first embossing 42 and the second embossing 44.

[0084] FIG 24 illustrates a perspective front view of the knob housing 14 for the front panel according to the fifth embodiment of the present invention. The knob housing 14 comprises the hooks 48 at its rear side. Said hooks 48 form a snap-in mechanism with the support plate 12.

[0085] FIG 25 illustrates a perspective front view of the holding frame 16 for the front panel according to the fifth embodiment of the present invention. The holding frame 16 includes the contact surfaces 38 and the distance elements 40.

[0086] FIG 26 illustrates a partial sectional side view of the support plate 12 with the decorative cover 10 and the holding frame 16 for the front panel according to the fifth embodiment of the present invention. FIG 26 clarifies the arrangement of the first embossing 42 and the second embossing 44. A part of the glue bead 18 is between the second embossing 44 and the decorative cover 10. Another part of the glue bead 18 is between the holding frame 16 and the decorative cover 10. The contact surface 34 of the holding frame 16 is supported by the first

embossing 42.

[0087] The method of the present invention reduces the number of steps for said method. Each embodiment of the inventive method can be performed manually or by a robot.

[0088] Since the decorative cover 10 is smaller than the support plate 12, the side walls of the decorative cover 10 can be illuminated for display and/or design purposes. A microsection at the side walls of the decorative cover 10 may be provided for coupling out of light. The possible structures of the microsections allow different effects. The coupling of light into the decorative cover 10 may be performed via holes for the knobs and/or keys or via additional holes. The decorative cover 10 may at least partially have a concave or convex structure in order to obtain the effects of lenses.

List of reference numerals

[0089]

10	decorative cover
12	support plate
14	knob housing
16	holding frame
18	glue bead on the decorative cover
20	glue bead on the support plate
22	embossing
24	round hole
26	transverse joint
28	hole in the embossing
30	contraction
32	glue bead on the decorative cover
34	contact surface
36	distance element
38	contact surface
40	distance element
42	first embossing
44	second embossing
46	centring element
48	hook

Claims

1. A method for assembling a front panel for a domestic appliance, wherein said method comprises the following steps:

- providing a decorative cover (10) made of one or more at least partially transparent materials,
- providing a support plate (12) with a rectangular cutout arranged in the central portion of said support plate (12) which is marginally smaller than the decorative cover (10),
- providing at least one holding device (14, 16) for receiving control elements and/or display devices,
- applying a glue bead (18, 32) onto a rear side of the decorative cover (10),
- attaching the support plate (12) onto the rear side of the decorative cover (10), and
- attaching the holding device (14, 16) onto the glue bead (18, 32),
- so that the glue bead (18, 32) is at least partially covered by the support plate (12) and the holding device (14, 16),

wherein the support plate (12) and the holding device (14, 16) are directly fixed on the decorative cover (10) by said glue bead.

2. The method according to claim 1, wherein the provided support plate (12) comprises an embossing (22) enclosing at least partially the cutout of said support plate (12) or an embossing (22) is prepared along the perimeter of the cutout of the support plate (12), wherein the embossing (22) is directed rearwards.

3. The method according to claim 2, wherein the thickness of the glue bead (18) between the rear side of the decorative cover (10) and the front side of the support plate (12) is defined by the deepness of the embossing (22).

4. The method according to claim 2 or 3, wherein a plurality of holes (28) in the embossing (22) is prepared, so that a part of the glue bead (18) swells through said holes (28) during attaching the support plate (12) onto the rear side of the decorative cover (10).

5. The method according to any one of the preceding claims, wherein
the glue bead (18) is prepared with a number of contractions (30) in order to obtain a number of places for glue dots, and the holding device (14, 16) is prefixed onto the rear side of the support plate (12) by said glue dots.

6. The method according to any one of the preceding claims, wherein
the support plate (12) and the holding device (14, 16) are centred and/or aligned during attaching the support plate (12) and the holding device (14, 16), respectively.

7. A front panel for a domestic appliance comprising:

- a decorative cover (10) made of one or more at least partially transparent materials,
- a support plate (12) with a rectangular cutout arranged in the central portion of the support plate (12) which is marginally smaller than said decorative cover (10),

- at least one holding device (14, 16) for receiving control elements and/or display devices,
- a glue bead (18, 32) applied on a rear side of the decorative cover (10), and
- wherein said support plate (12) is attached on the rear side of the decorative cover (10), and
- the holding device (14, 16) is attached on the glue bead (18, 32),
- so that the glue bead (18, 32) is at least partially covered by the support plate (12) and the holding device (14, 16),

wherein the support plate (12) and the holding device (14, 16) are directly fixed on the decorative cover (10) by said glue bead.

8. The front panel according to claim 7, wherein said support plate (12) comprises an embossing (22) enclosing at least partially the cutout of said support plate (12), and wherein the embossing (22) is directed rearwards.

9. The front panel according to claim 8, wherein the thickness of the glue bead (18) between the rear side of the decorative cover (10) and the front side of the support plate (12) is defined by the deepness of the embossing (22).

10. The front panel according to claim 8.9 or 9, wherein the embossing (22) includes a plurality of holes (28), so that a part of the glue bead (18) penetrates through said holes (28).

11. The front panel according to any one of the claims 7 to 10, wherein
the glue bead (18) comprises a number of contractions (30), so that a number of places for glue dots is obtained, and the holding device (14, 16) is prefixed on the rear side of the support plate (12) by said glue dots.

12. The front panel according to any one of the claims 7 to 11,
wherein the decorative cover (10) is the foremost component of the front panel.

13. The front panel according to claim 12, wherein the side walls of the decorative cover (10) are illuminated or illuminable for display and/or design purposes.

Patentansprüche

1. Verfahren zur Montage einer Frontplatte für ein Haushaltsgerät, wobei das Verfahren die folgenden Schritte umfasst:

- Bereitstellen einer dekorativen Abdeckung (10), die aus einem oder mehreren zumindest teilweise transparenten Werkstoffen hergestellt ist,
- Bereitstellen einer Trägerplatte (12) mit einer rechteckigen Aussparung im mittleren Teil der Trägerplatte (12), die geringfügig kleiner als die dekorative Abdeckung (10) ist,
- Bereitstellen mindestens einer Haltevorrichtung (14, 16) zum Aufnehmen von Steuerelementen und/oder Anzeigevorrichtungen,
- Aufbringen einer Kleberaupe (18, 32) auf einer Rückseite der dekorativen Abdeckung (10),
- Anbringen der Trägerplatte (12) auf der Rückseite der dekorativen Abdeckung (10) und
- Anbringen der Haltevorrichtung (14, 16) auf der Kleberaupe (18, 32),
- so dass die Kleberaupe (18, 32) zumindest teilweise durch die Trägerplatte (12) und die Haltevorrichtung (14, 16) bedeckt ist,

wobei die Trägerplatte (12) und die Haltevorrichtung (14, 16) durch die Kleberaupe direkt auf der dekorativen Abdeckung (10) befestigt werden.

2. Verfahren nach Anspruch 1, wobei die bereitgestellte Trägerplatte (12) eine Prägung (22) umfasst, die zumindest teilweise die Aussparung der Trägerplatte (12) umschließt, oder wobei eine Prägung (22) entlang des Umfangs der Aussparung der Trägerplatte (12) hergestellt wird, wobei die Prägung (22) nach hinten gerichtet ist.

3. Verfahren nach Anspruch 2, wobei die Dicke der Kleberaupe (18) zwischen der Rückseite der dekorativen Abdeckung (10) und der Vorderseite der Trägerplatte (12) durch die Tiefe der Prägung (22) definiert wird.

4. Verfahren nach Anspruch 2 oder 3, wobei eine Vielzahl von Löchern (28) in der Prägung (22) hergestellt wird, so dass ein Teil der Kleberaupe (18) während der Befestigung der Trägerplatte (12) an der Rückseite der dekorativen Abdeckung (10) durch die Löcher (28) quillt.

5. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Kleberaupe (18) mit einer Anzahl von Verengungen (30) hergestellt wird, um eine Anzahl von Stellen für Klebepunkte zu erhalten, und wobei die Haltevorrichtung (14, 16) durch die Klebepunkte auf der Rückseite der Trägerplatte (12) vorbefestigt wird.

6. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Trägerplatte (12) und die Haltevorrichtung (14, 16) während der Befestigung der Trägerplatte (12) bzw. der Haltevorrichtung (14, 16) zentriert und/oder ausgerichtet werden.

7. Frontplatte für ein Haushaltsgerät, umfassend:

- eine dekorative Abdeckung (10), die aus einem oder mehreren zumindest teilweise transparenten Werkstoffen hergestellt ist,
- eine Trägerplatte (12) mit einer rechteckigen Aussparung im mittleren Teil der Trägerplatte (12), die geringfügig kleiner als die dekorative Abdeckung (10) ist,
- mindestens eine Haltevorrichtung (14, 16) zum Aufnehmen von Steuerelementen und/oder Anzeigevorrichtungen,
- eine Kleberaupe (18, 32), die auf einer Rückseite der dekorativen Abdeckung (10) aufgebracht ist, und
- wobei die Trägerplatte (12) an der Rückseite der dekorativen Abdeckung (10) angebracht ist und
- die Haltevorrichtung (14, 16) auf der Kleberaupe (18, 32) angebracht ist,
- so dass die Kleberaupe (18, 32) zumindest teilweise durch die Trägerplatte (12) und die Haltevorrichtung (14, 16) bedeckt ist,

wobei die Trägerplatte (12) und die Haltevorrichtung (14, 16) durch die Kleberaupe direkt auf der dekorativen Abdeckung (10) befestigt werden.

8. Frontplatte nach Anspruch 7, wobei die Trägerplatte (12) eine Prägung (22) umfasst, die zumindest teilweise die Aussparung der Trägerplatte (12) umschließt und wobei die Prägung (22) nach hinten gerichtet ist.

9. Frontplatte nach Anspruch 8, wobei die Dicke der Kleberaupe (18) zwischen der Rückseite der dekorativen Abdeckung (10) und der Vorderseite der Trägerplatte (12) durch die Tiefe der Prägung (22) definiert wird.

10. Frontplatte nach Anspruch 8 oder 9, wobei die Prägung (22) eine Vielzahl von Löchern (28) umfasst, so dass ein Teil der Kleberaupe (18) durch die Löcher (28) durchdringt.

11. Frontplatte nach einem der Ansprüche 7 bis 10, wobei die Kleberaupe (18) eine Anzahl von Verengungen (30) umfasst, so dass eine Anzahl von Stellen für Klebepunkte gebildet wird, und wobei die Haltevorrichtung (14, 16) durch die Klebepunkte auf der Rückseite der Trägerplatte (12) vorbefestigt wird.

12. Frontplatte nach einem der Ansprüche 7 bis 11, wobei die dekorative Abdeckung (10) die vorderste Komponente der Frontplatte ist.

13. Frontplatte nach Anspruch 12, wobei die Seitenwände der dekorativen Abdeckung (10) für Anzeige- und/oder Design-Zwecke beleuchtet sind oder beleuchtet werden können.

Revendications

1. Procédé d'assemblage d'un panneau frontal pour un appareil domestique, où ledit procédé comprend les étapes suivantes :

- fournir un recouvrement décoratif (10) fabriqué en un ou plusieurs matériaux au moins partiellement transparents,
- fournir une plaque de support (12) avec une découpure rectangulaire agencée dans la portion centrale de ladite plaque de support (12) qui est marginalement plus petite que le recouvrement décoratif (10),
- fournir au moins un dispositif de retenue (14, 16) pour recevoir des éléments de commande et/ou des dispositifs d'affichage,
- appliquer un bourrelet de colle (18, 32) sur un côté arrière du recouvrement décoratif (10),
- fixer la plaque de support (12) sur le côté arrière du recouvrement décoratif (10), et
- fixer le dispositif de retenue (14, 16) sur le bourrelet de colle (18, 32),
- de sorte que le bourrelet de colle (18, 32) soit au moins partiellement recouvert par la plaque de support (12) et le dispositif de retenue (14, 16), la plaque de support (12) et le dispositif de retenue (14, 16) étant directement fixés sur le recouvrement décoratif (10) par ledit bourrelet de colle.

2. Procédé selon la revendication 1, dans lequel la plaque de support réalisée (12) comprend un bosselage (22) renfermant au moins partiellement la découpure de ladite plaque de support (12), ou un bosselage (22) est préparé le long du périmètre de la découpure de la plaque de support (12), où le bosselage (22) est dirigé vers l'arrière.

3. Procédé selon la revendication 2, dans lequel l'épaisseur du bourrelet de colle (18) entre le côté arrière du recouvrement décoratif (10) et le côté frontal de la plaque de support (12) est définie par la profondeur du bosselage (22).

4. Procédé selon la revendication 2 ou 3, dans lequel une pluralité de trous (28) dans le bosselage (22) est préparée de sorte qu'une partie du bourrelet de colle (18) gonfle à travers lesdits trous (28) durant la fixation de la plaque de support (12) sur le côté arrière du recouvrement décoratif (10).

5. Procédé selon l'une quelconque des revendications précédentes, dans lequel le bourrelet de colle (18)

est préparé avec un nombre de resserrements (30) pour obtenir un nombre de places pour des pointes de colle, et le dispositif de retenue (14, 16) est préfixé sur le côté arrière de la plaque de support (12) par lesdites pointes de colle.

6. Procédé selon l'une quelconque des revendications précédentes, dans lequel la plaque de support (12) et le dispositif de retenue (14, 16) sont centrés et/ou alignés durant la fixation de la plaque de support (12) et du dispositif de retenue (14, 16) respectivement.

7. Panneau frontal pour un appareil domestique, comprenant :

- un recouvrement décoratif (10) fabriqué en un ou plusieurs matériaux au moins partiellement transparents,
- une plaque de support (12) avec une découpure rectangulaire agencée dans la portion centrale de la plaque de support (12) qui est marginalement plus petite que ledit recouvrement décoratif (10),
- au moins un dispositif de retenue (14, 16) pour recevoir des éléments de commande et/ou des dispositifs d'affichage,
- un bourrelet de colle (18, 32) appliqué sur un côté arrière du recouvrement décoratif (10), et
- dans lequel ladite plaque de support (12) est fixée au côté arrière du recouvrement décoratif (10), et
- le dispositif de retenue (14, 16) est fixé sur le bourrelet de colle (18, 32), - de sorte que le bourrelet de colle (18, 32) est au moins partiellement recouvert par la plaque de support (12) et le dispositif de retenue (14, 16),

la plaque de support (12) et le dispositif de retenue (14, 16) étant directement fixés sur le recouvrement décoratif (10) par ledit bourrelet de colle.

8. Panneau frontal selon la revendication 7, dans lequel ladite plaque de support (12) comprend un bosselage (22) renfermant au moins partiellement la découpure de ladite plaque de support (12), et où le bosselage (22) est dirigé vers l'arrière.

9. Panneau frontal selon la revendication 8, dans lequel l'épaisseur du bourrelet de colle (18) entre le côté arrière du recouvrement décoratif (10) et le côté frontal de la plaque de support (12) est définie par la profondeur du bosselage (22).

10. Panneau frontal selon la revendication 8 ou 9, dans lequel le bosselage (22) comprend une pluralité de trous (28) de sorte qu'une partie du bourrelet de colle (18) pénètre à travers lesdits trous (28).

11. Panneau frontal selon l'une quelconque des revendications 7 à 10, dans lequel le bourrelet de colle (18) comprend un nombre de resserrements (30), de sorte qu'un nombre de places pour des pointes de colle est obtenu, et le dispositif de retenue (14, 16) est préfixé sur le côté arrière de la plaque de support (12) par lesdites pointes de colle.

12. Panneau frontal selon l'une quelconque des revendications 7 à 11, dans lequel le recouvrement décoratif (10) est le composant le plus avant du panneau frontal.

13. Panneau frontal selon la revendication 12, dans lequel les parois latérales du recouvrement décoratif (10) sont éclairées ou peuvent être éclairées à des fins d'affichage et/ou de design.

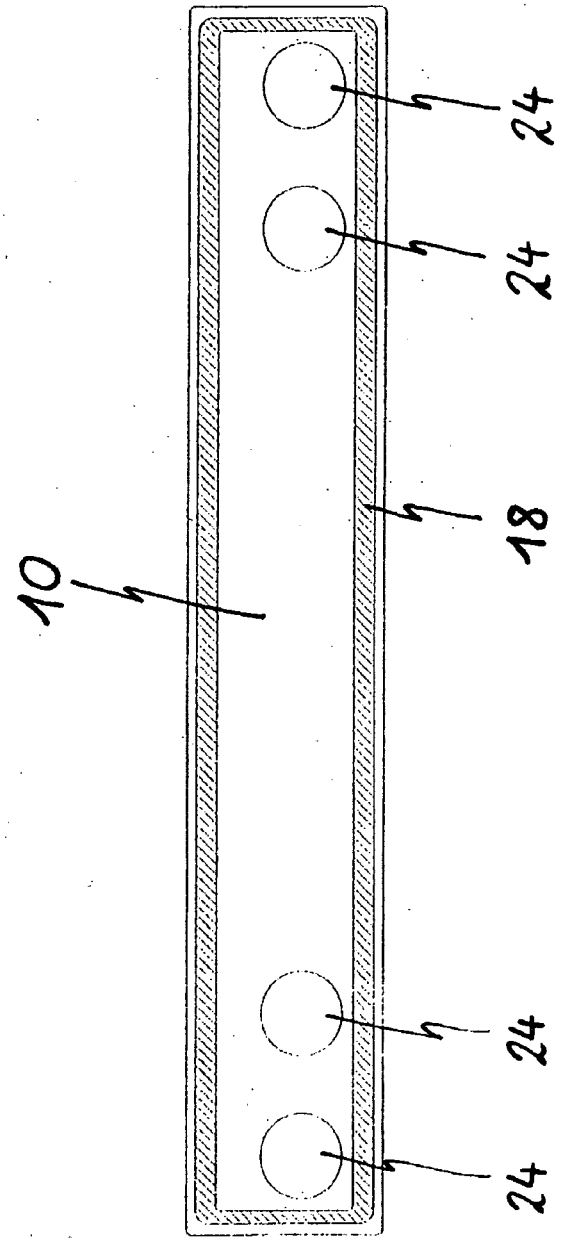


FIG. 1

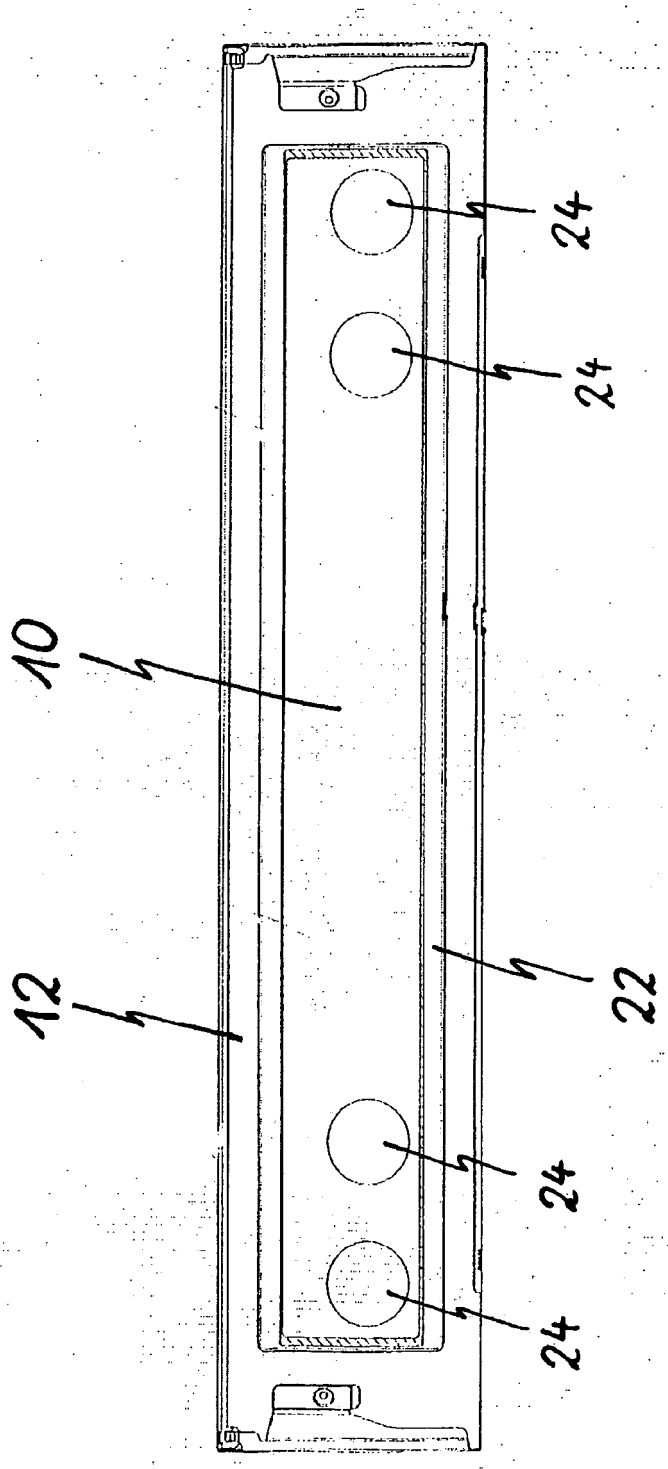


FIG. 2

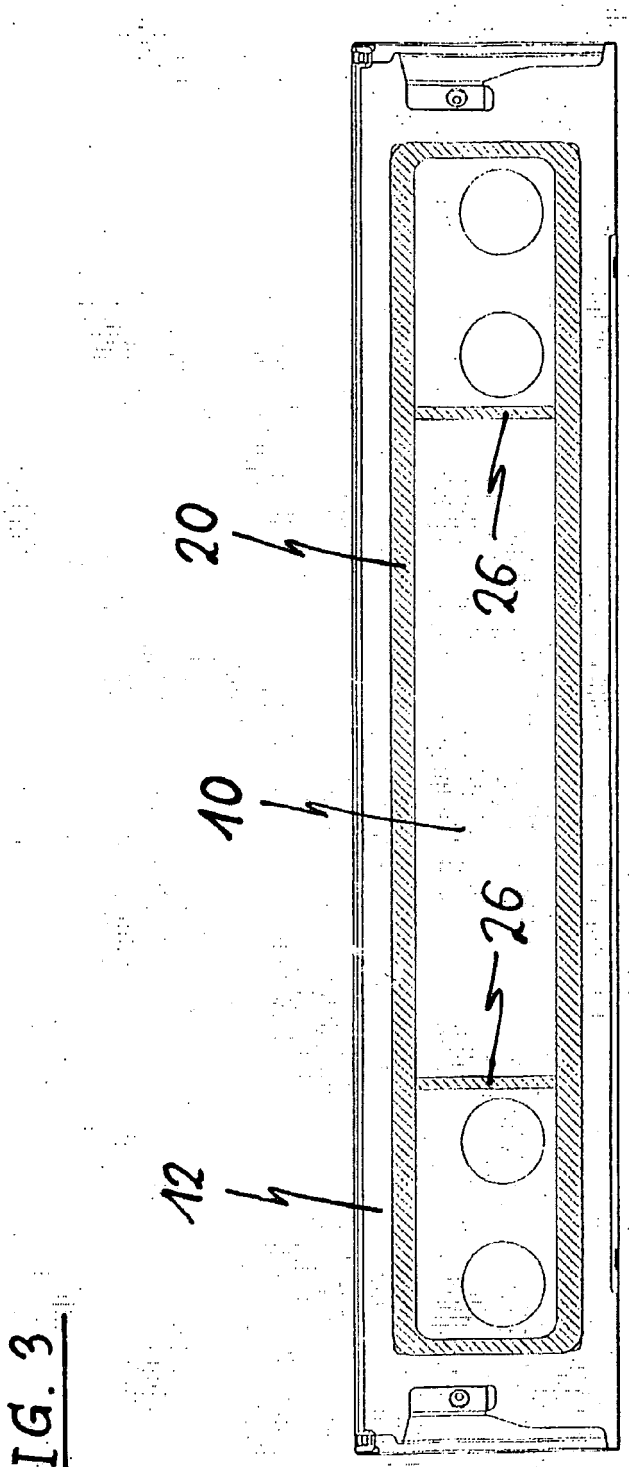


FIG. 3

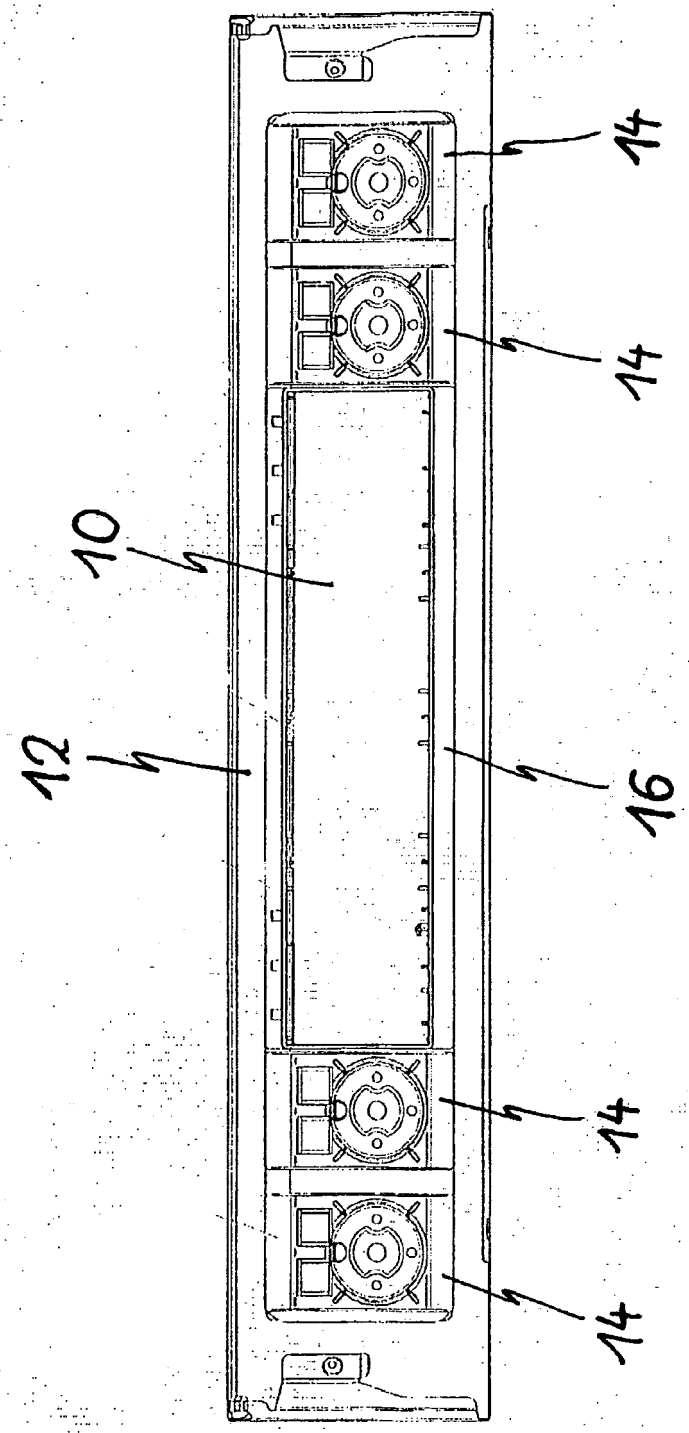


FIG. 4

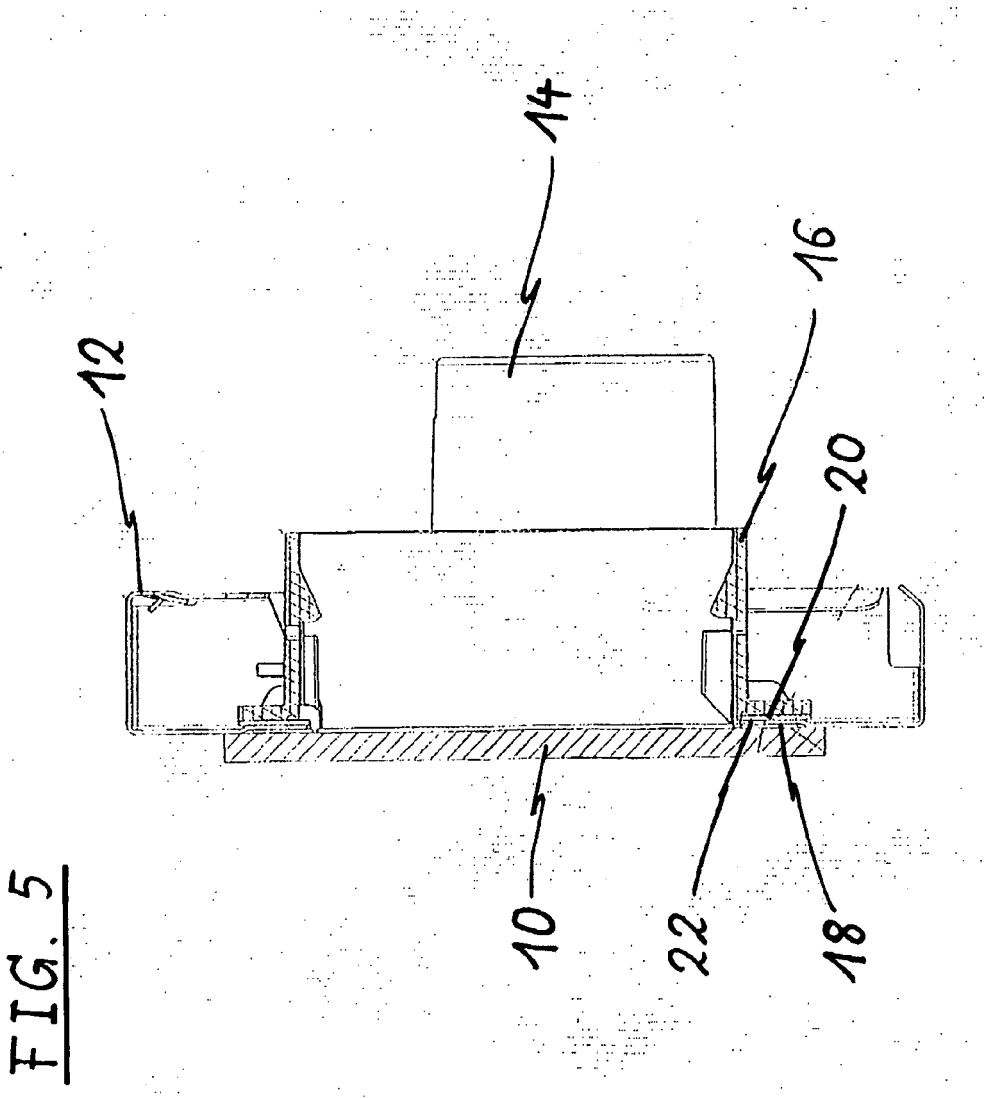


FIG. 5

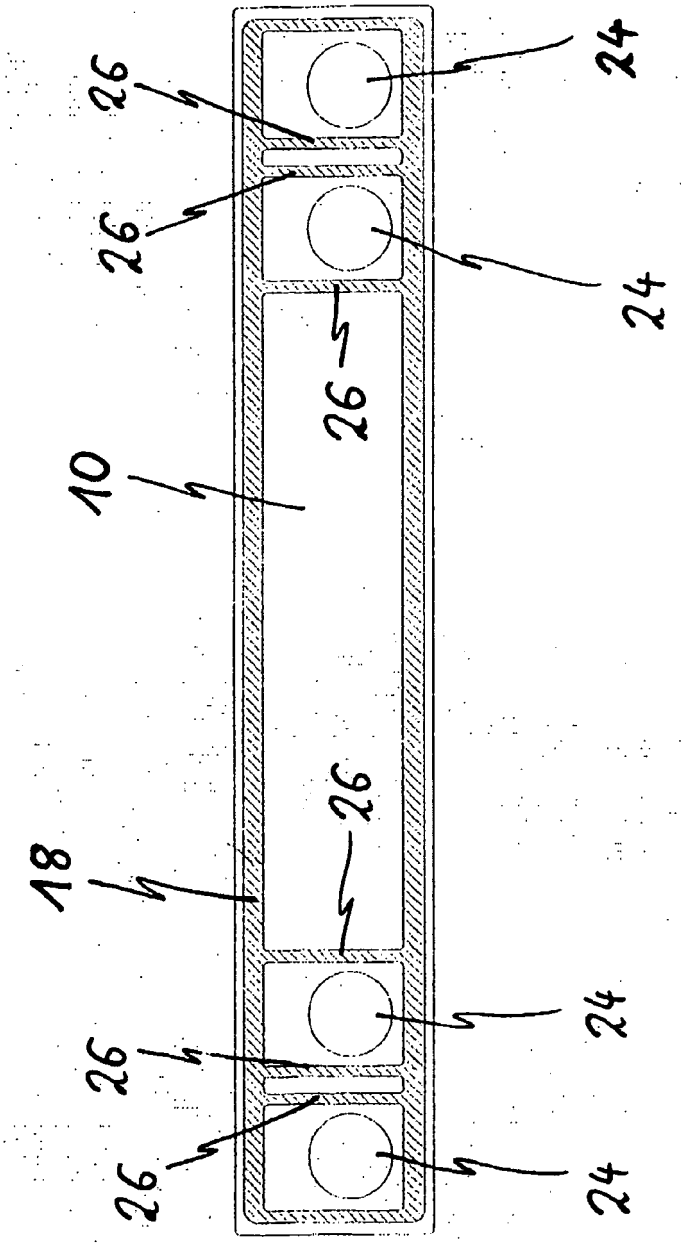


FIG. 6

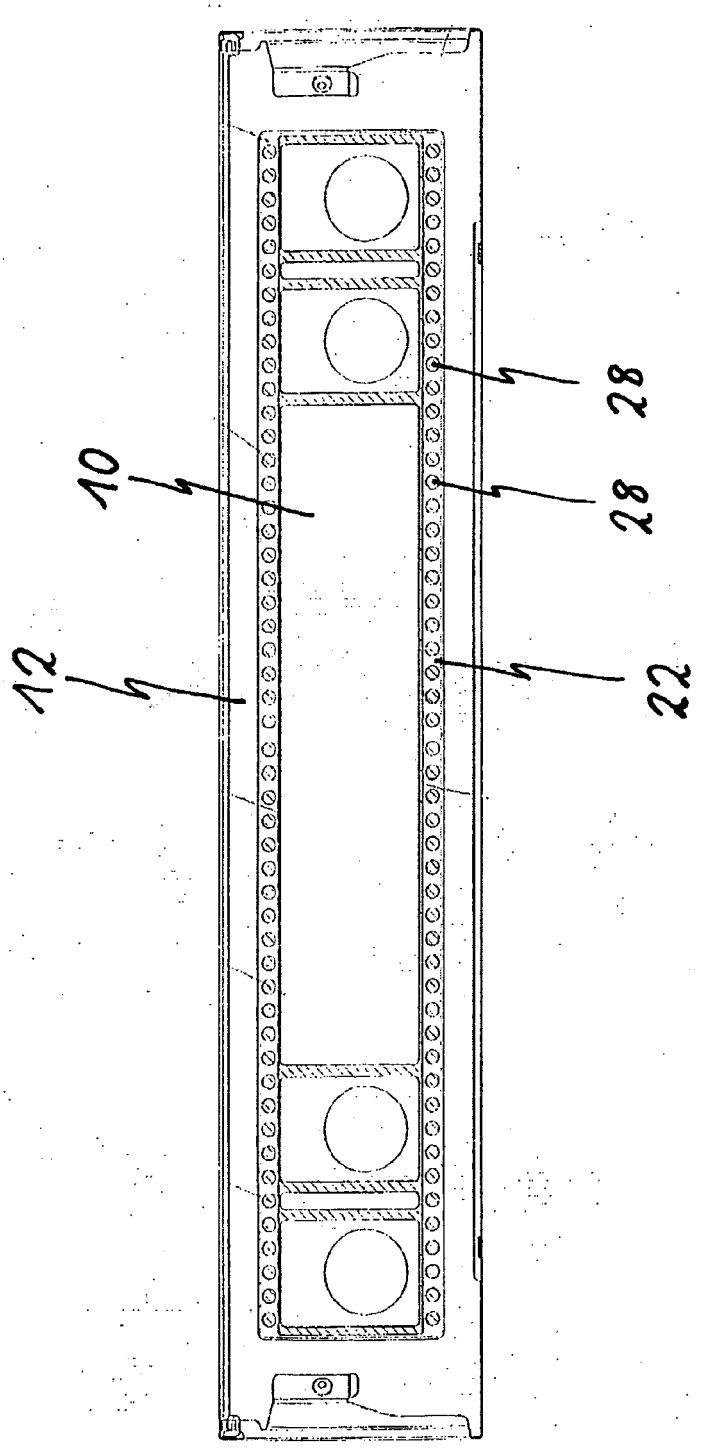


FIG. 7

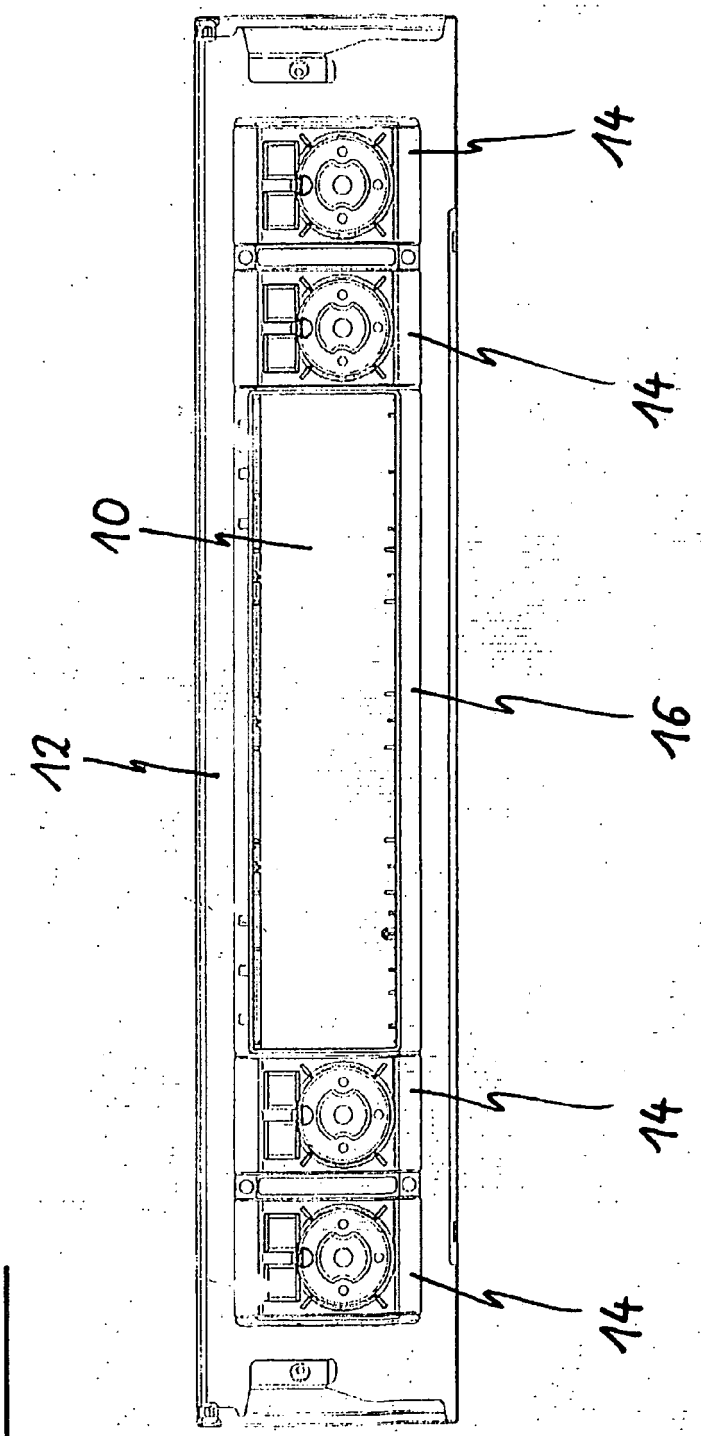


FIG. 8

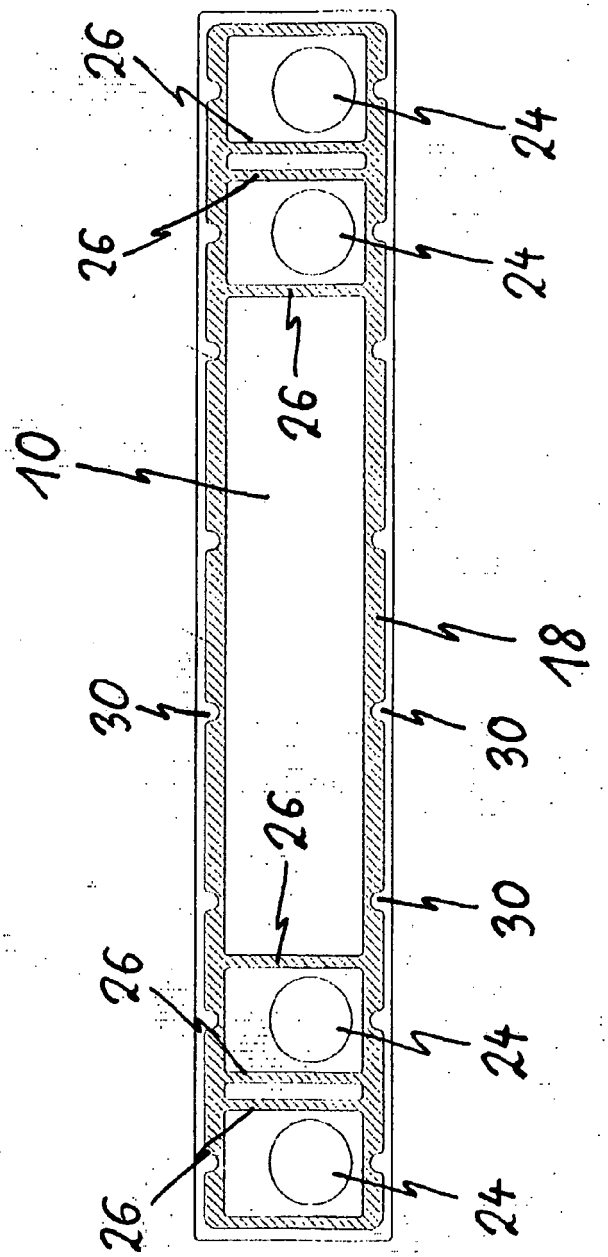


FIG. 9

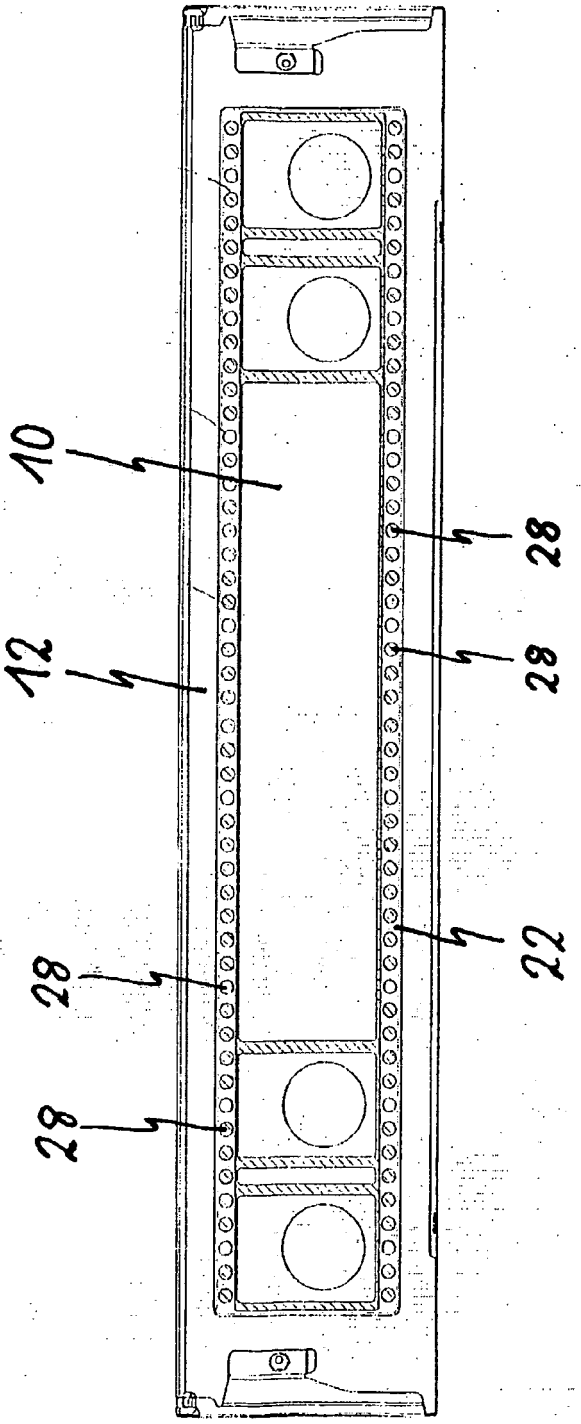


FIG. 10

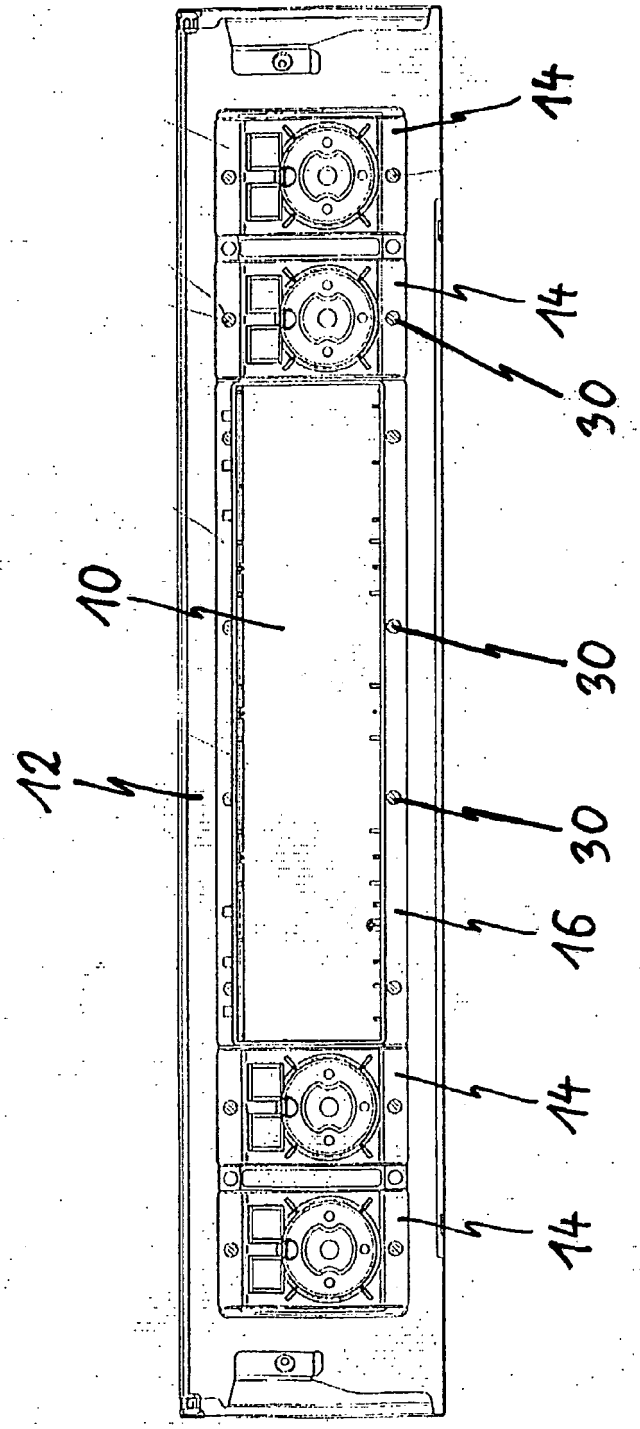


FIG. 11

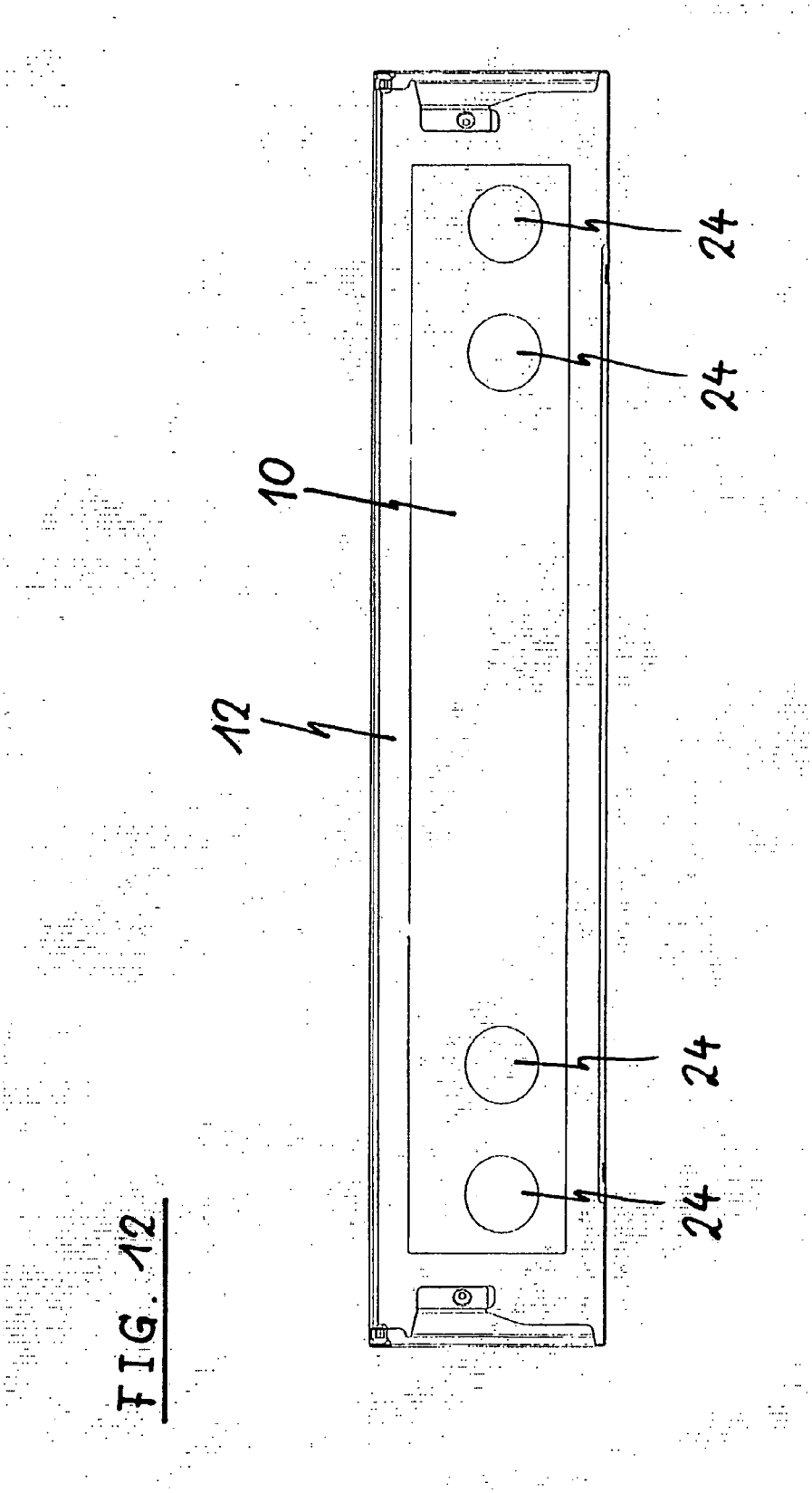


FIG. 12

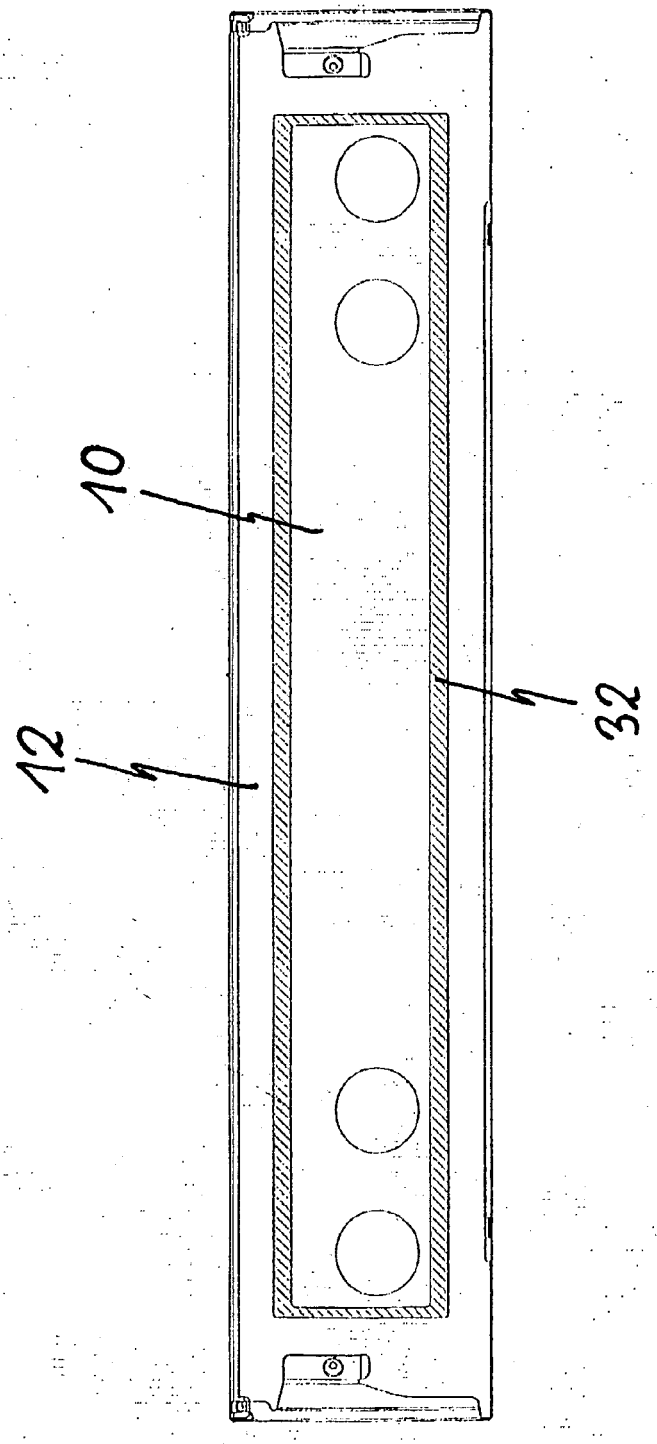


FIG. 13

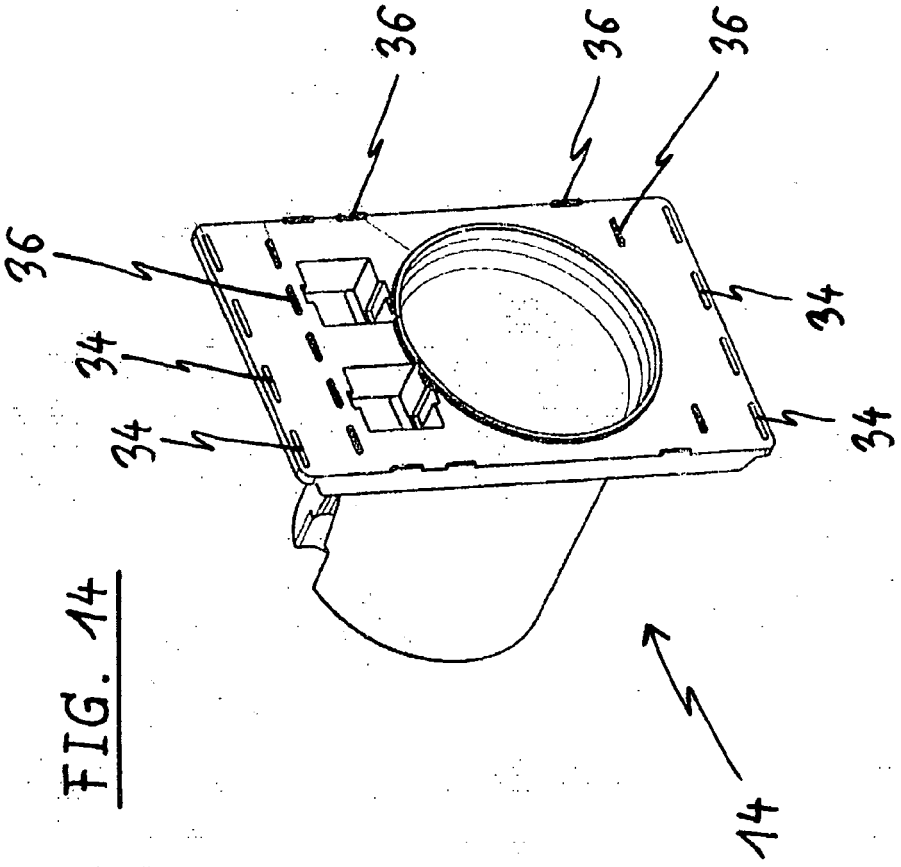


FIG. 14

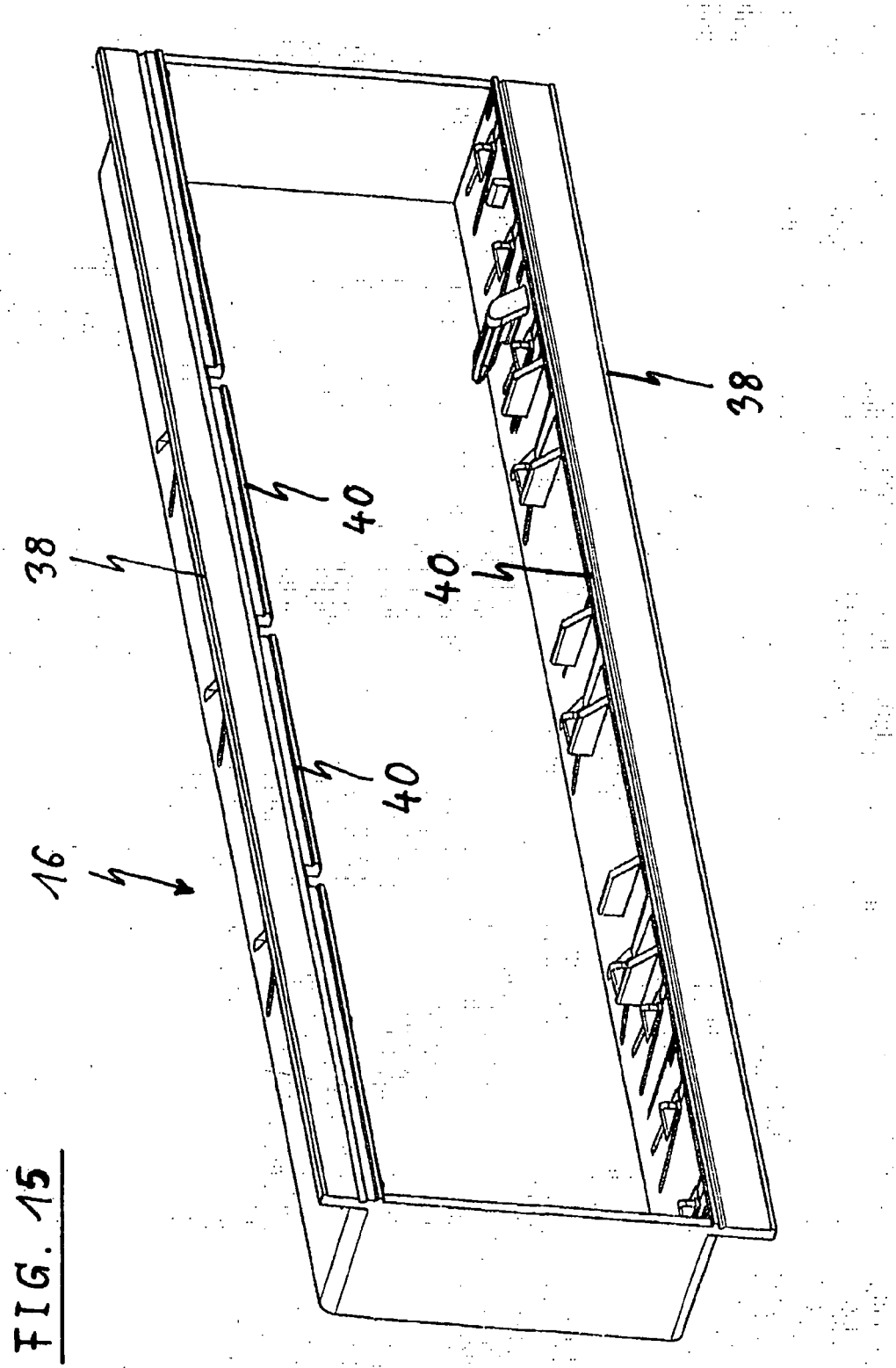


FIG. 15

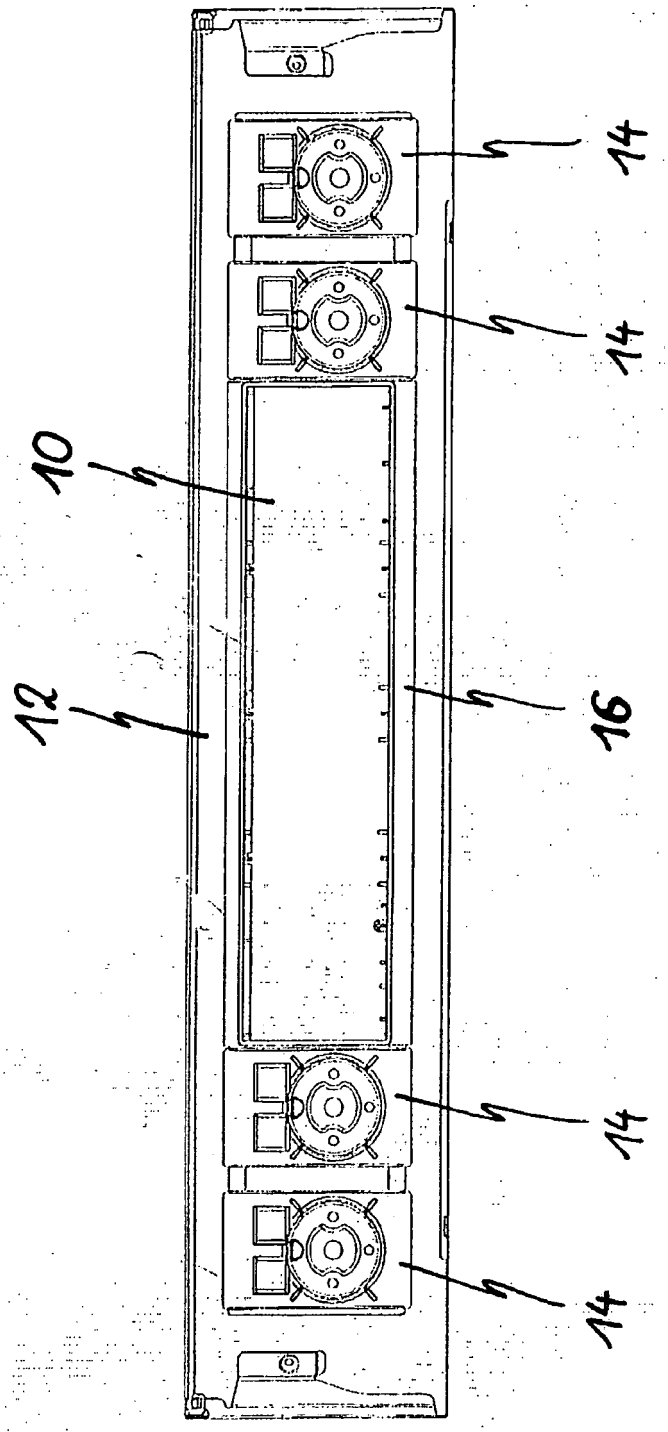


FIG. 16

FIG. 17

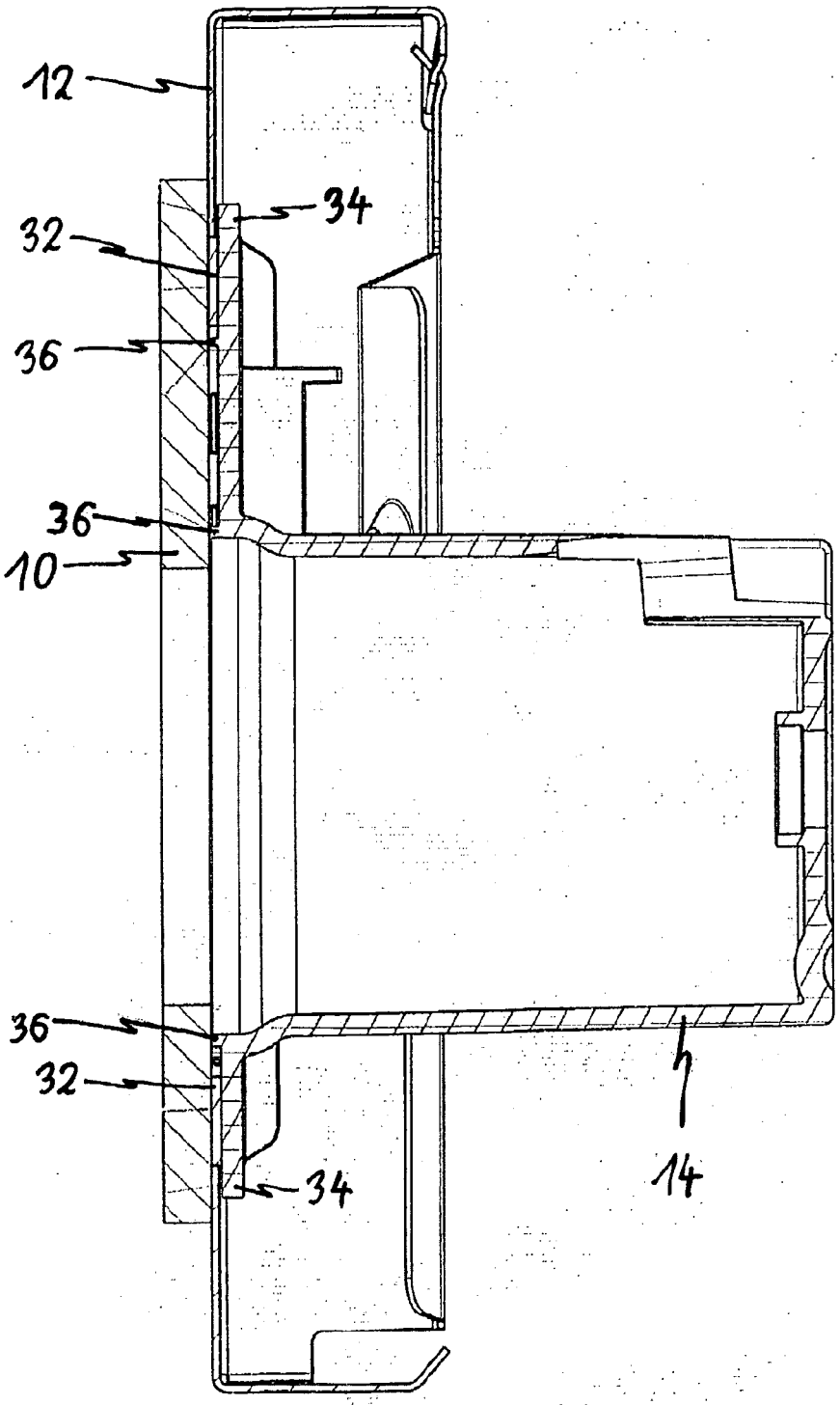
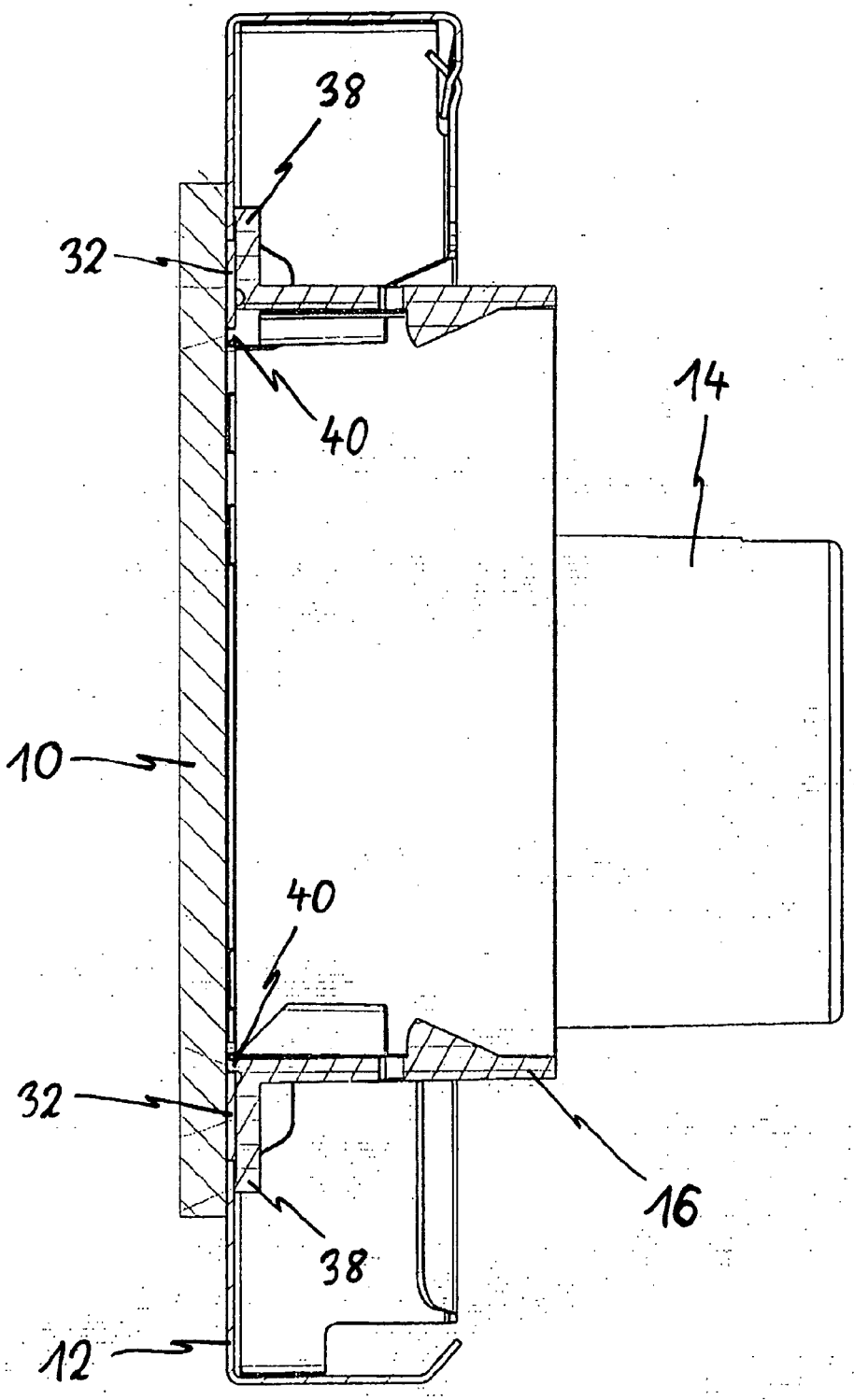


FIG. 18



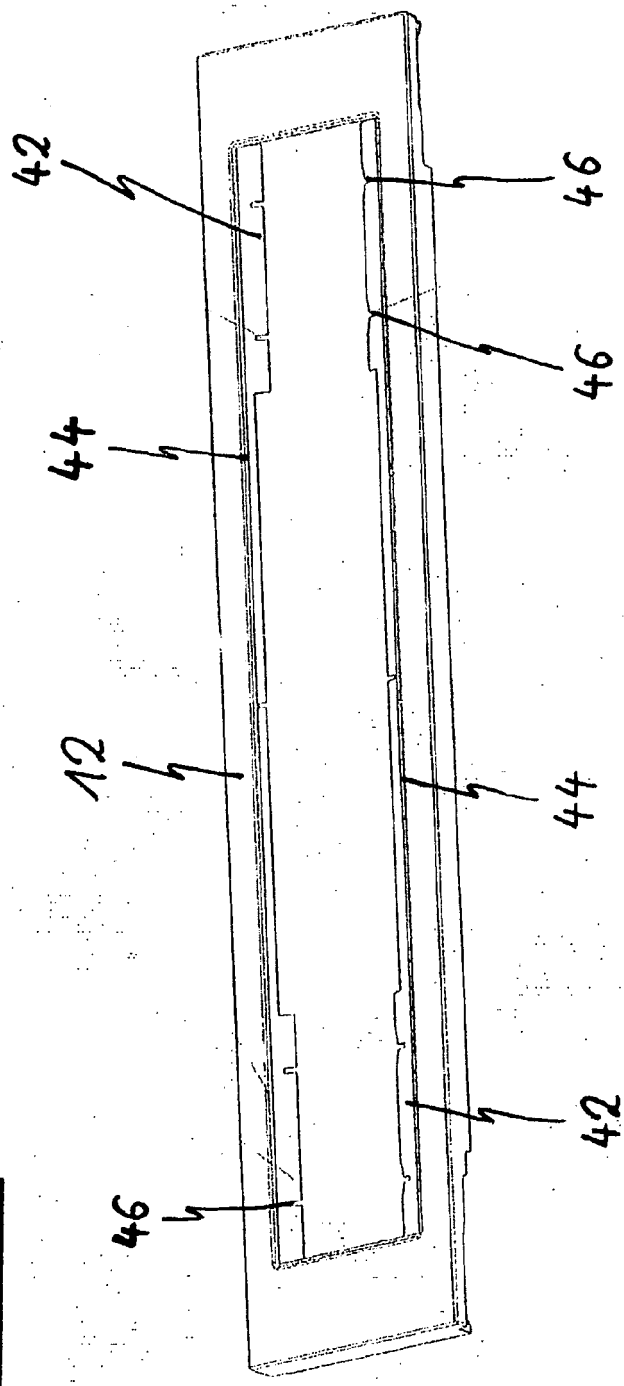


FIG. 19

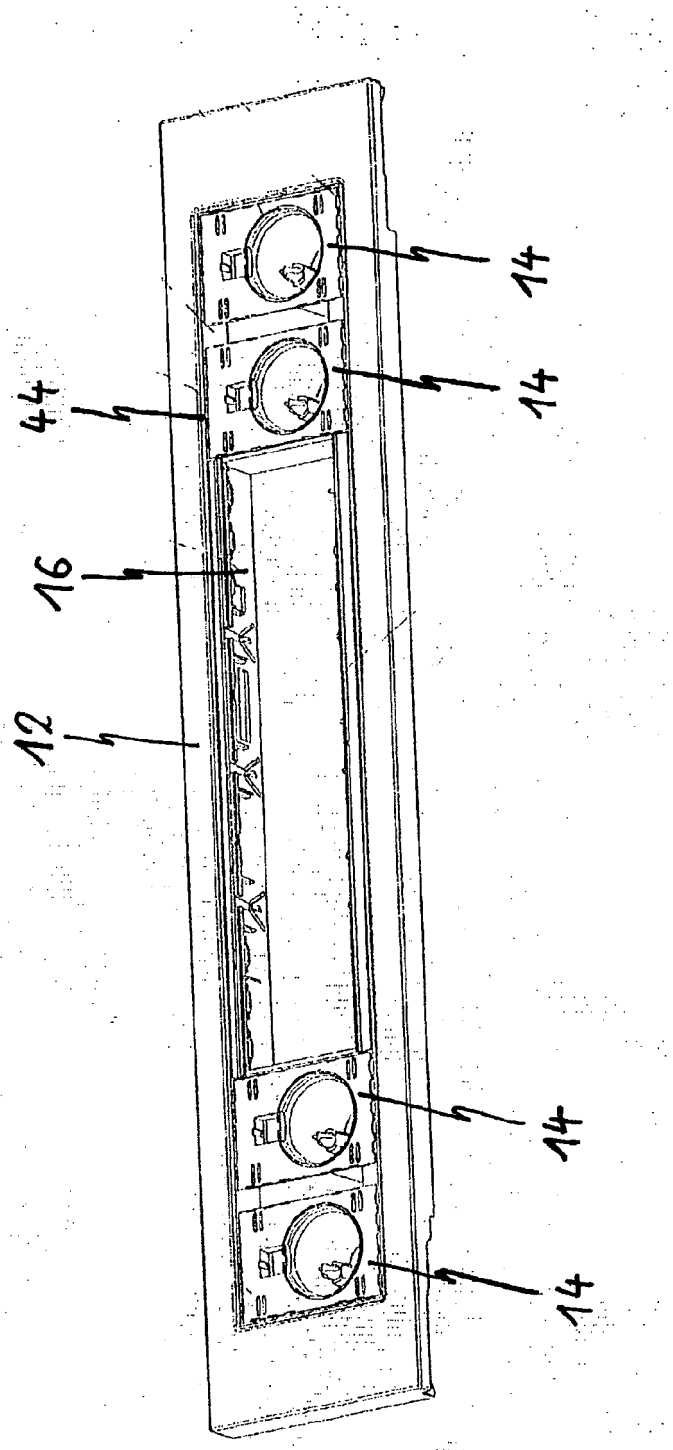


FIG. 20

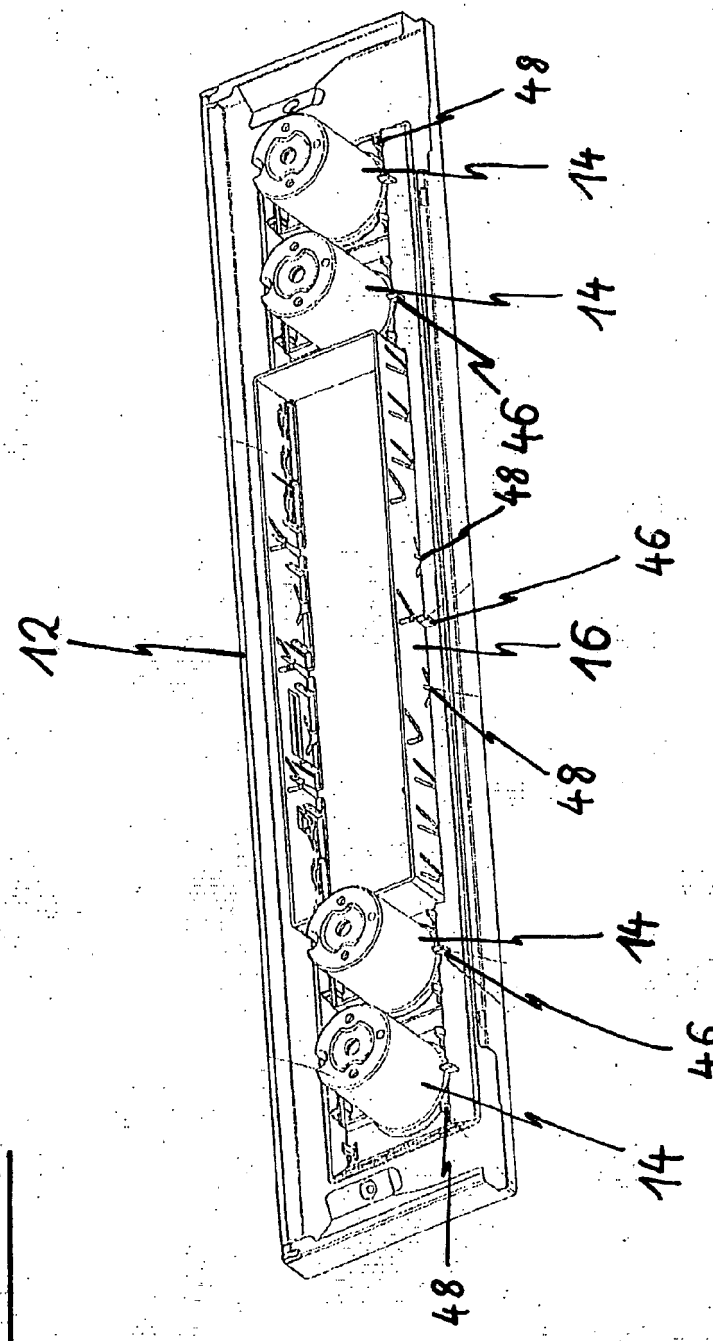


FIG. 21

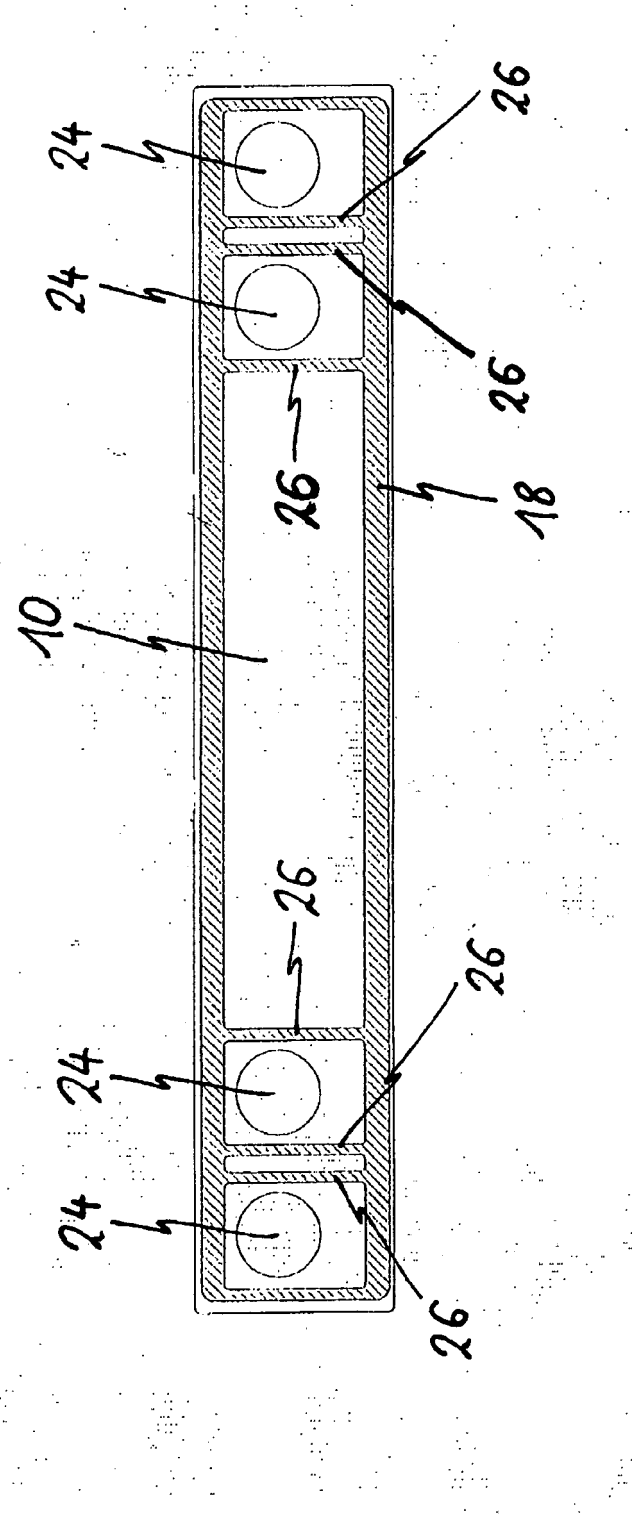


FIG. 22

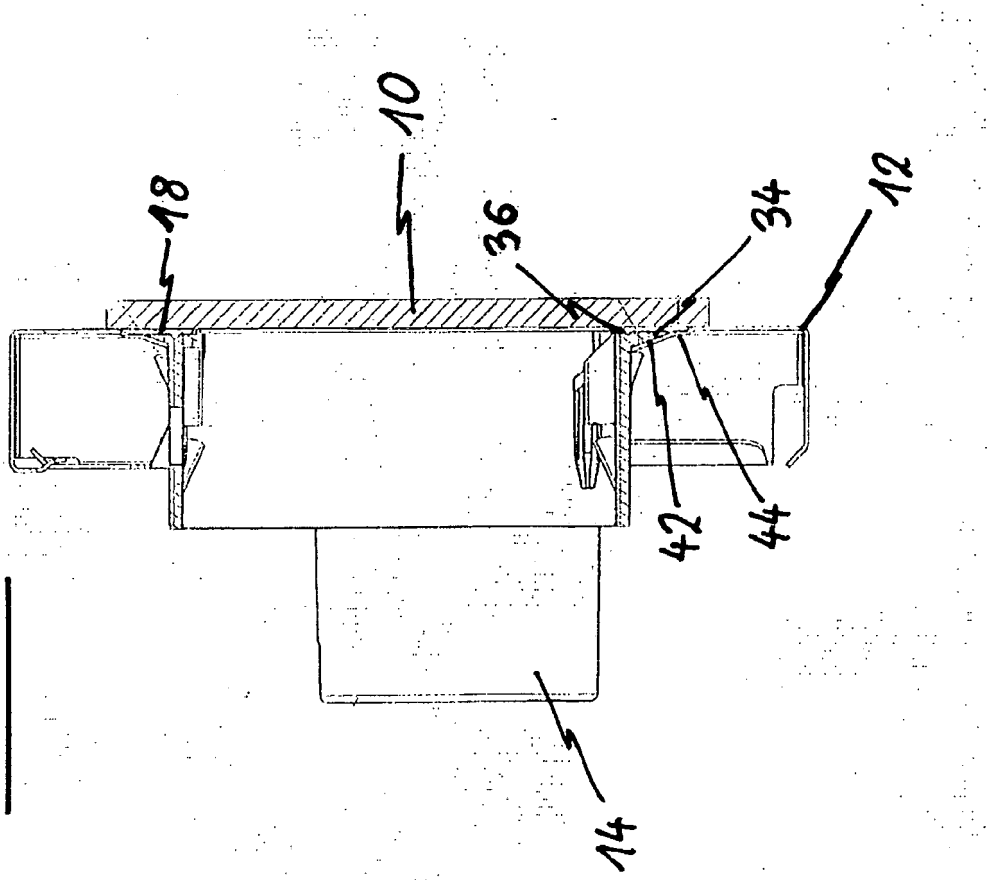


FIG. 23

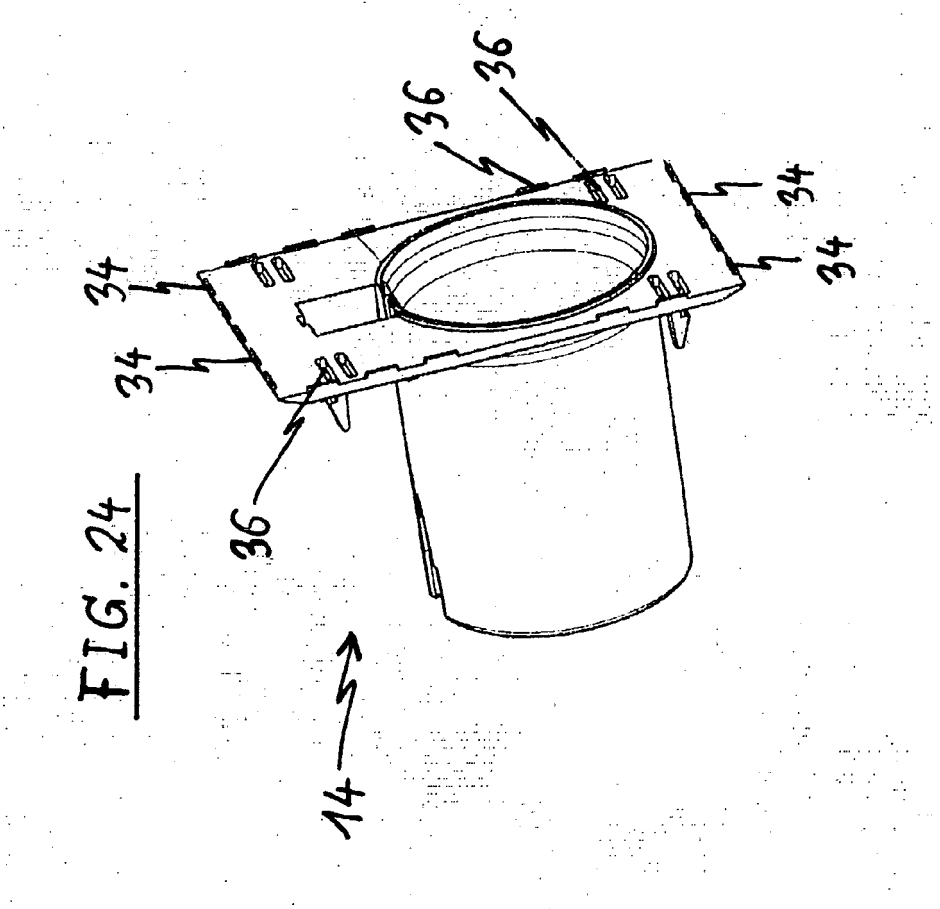


FIG. 24

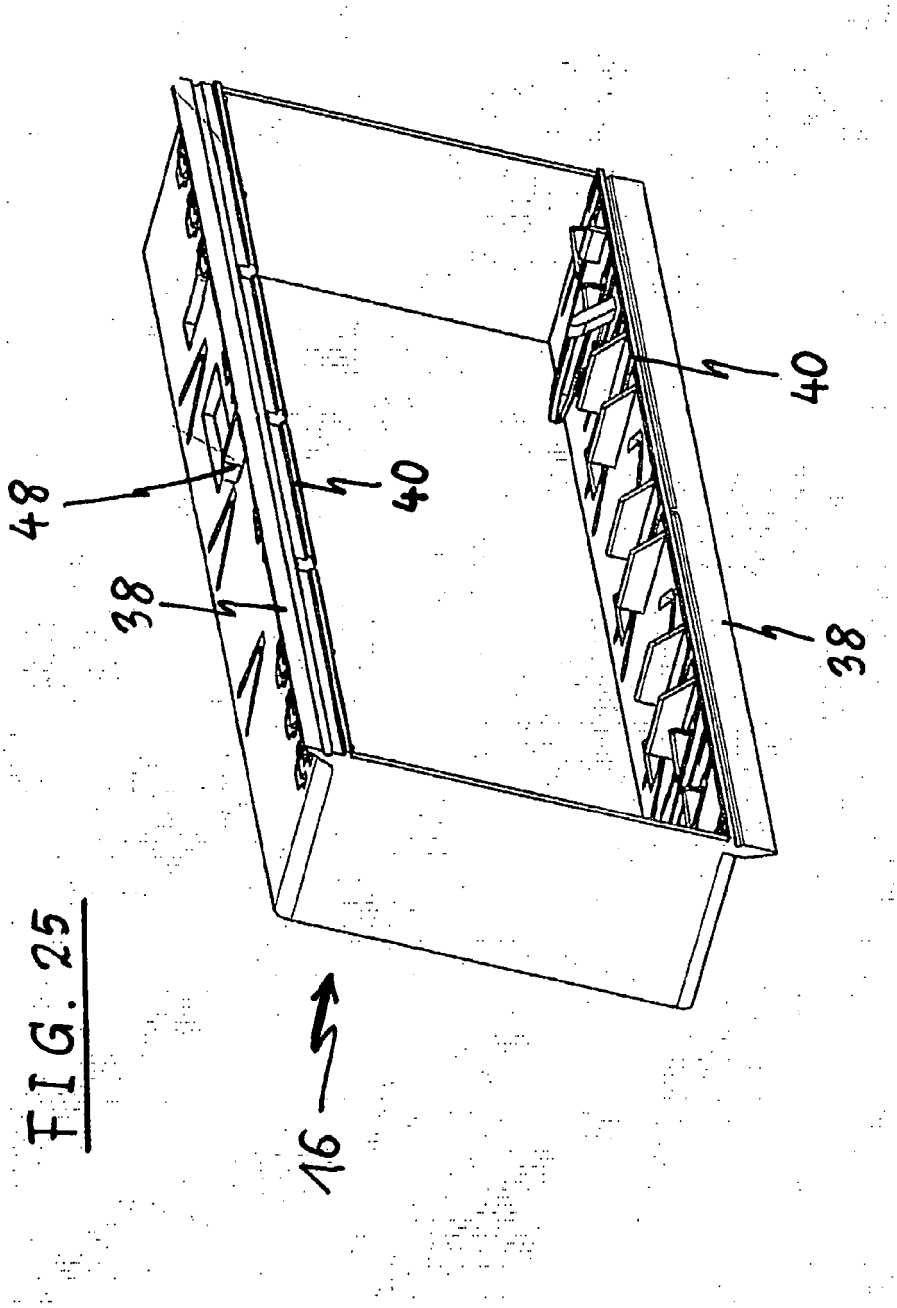


FIG. 25

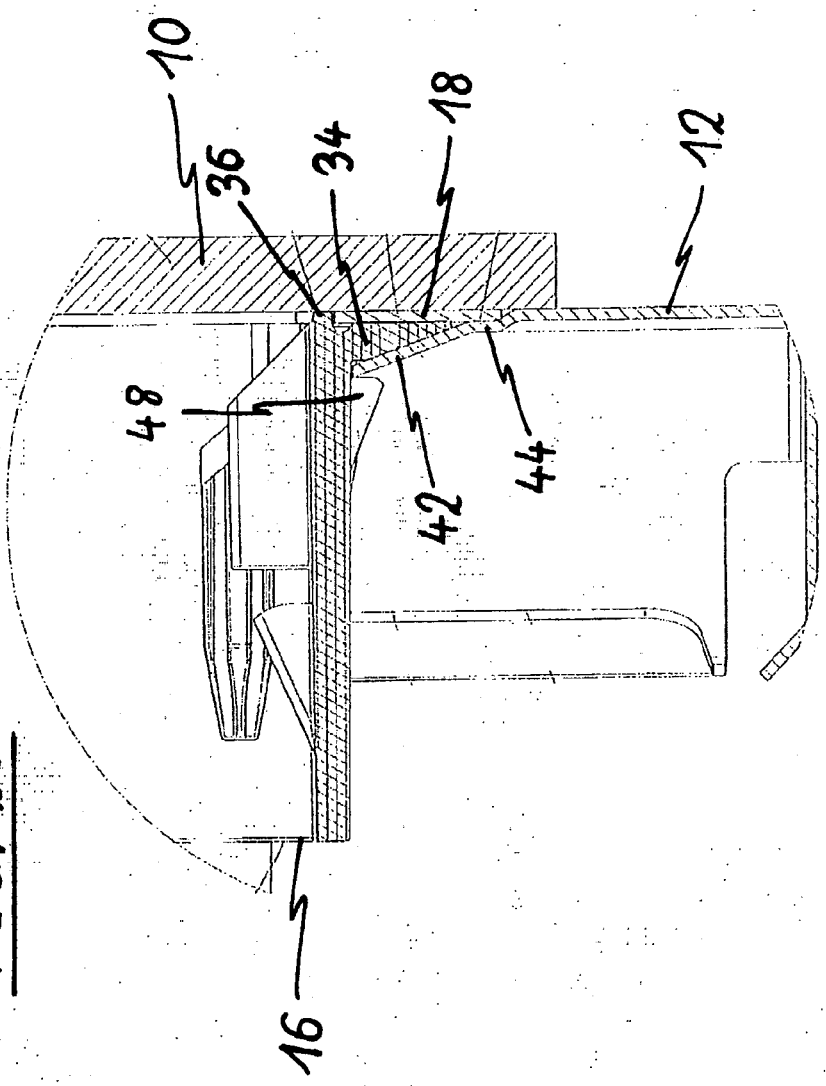


FIG. 26

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 102005024934 A1 **[0004]**