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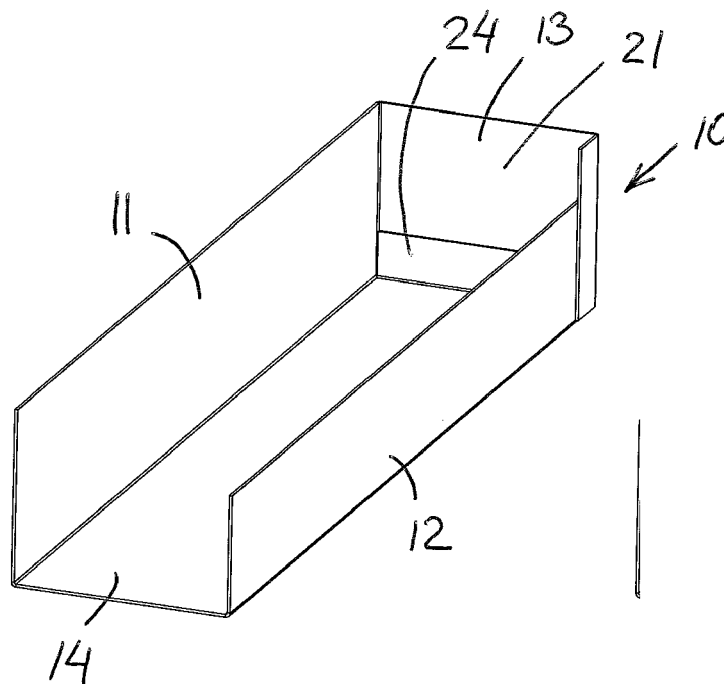
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(54) **CABINET FOR PLUMBING AND HEATING EQUIPMENT WITH SEALING DEVICE**

(57) The invention relates to a cabinet for plumbing and heating equipment having at least a bottom portion (10) provided with pipe through-fittings and formed from a sheet metal blank by stamping and bending suitable portions thereof so as to form said bottom portion (10), said bottom portion (10) having a rear side (11), a front side (12), flanged ends (13) and a bottom (14) which are

connected to each other in a non-waterproof way. The bottom portion (10) at its opposite flanged ends (13) is provided with at least one sealing device having such size and shape that it is adapted to press against the inside of the rear side (11), the front side (12), the flanged end (13) and the bottom (14) of the bottom portion (10) so as to enable the bottom portion (10) to be waterproof.



**Fig. 2**

## Description

### Field of the Invention

[0001] The present invention relates to a cabinet for plumbing and heating equipment, preferably a cabinet for plumbing and heating equipment with sealing device for making at least a bottom portion thereof waterproof, of the kind defined in the preamble of the accompanying claim 1.

### Background of the Invention

[0002] In the application, by plumbing and heating equipment is meant pipe systems for underfloor heating, tap water, solar heating, radiators, etc.

[0003] Present cabinets are often made of lacquered sheet metal and provided with suitable waterproof pipe through-fittings for pipings. They are also often provided with a leak indicator.

[0004] In recent time, there is a demand that such cabinets shall be waterproof at least at the bottom thereof. Therefore, the joints at the bottom of the so made cabinets are welded or in any other way made leakproof so as to make the bottom of the cabinets leakproof/waterproof such that a possible leakage of water from the pipe fittings etc. will be collected at the bottom of the cabinets and detected by a possibly provided leak indicator or be led to a drain, for instance.

[0005] However, these measures to avoid possible leakage from the bottom of the cabinets will increase the manufacturing costs, and thus the end product will be more expensive.

[0006] Accordingly, an object of the present invention is to provide a cabinet for plumbing and heating equipment with sealing device for making at least a bottom portion thereof waterproof, which cabinet can be manufactured a simple and inexpensive way and which fulfils present demands.

[0007] According to the invention, this object is achieved by a cabinet for plumbing and heating equipment having at least a bottom portion provided with pipe through-fittings and formed from a sheet metal blank by stamping and bending suitable portions thereof so as to form said bottom portion, said bottom portion having a rear side, a front side, flanged ends and a bottom which are connected to each other in a non-waterproof way, characterized in that the bottom portion at its opposite flanged ends is provided with at least one sealing device having such size and shape that it is adapted to press against the inside of the rear side, the front side, the flanged end and the bottom of the bottom portion so as to enable the bottom portion to be waterproof.

[0008] Other embodiments of the invention will be apparent from the accompanying dependent claims.

## Brief description of drawings

[0009] The invention will now be described by way of a non-limiting example with reference to the accompanying drawing, in which

- Fig. 1 is a view from the front of an example of a prior art cabinet for plumbing and heating equipment,
- Fig. 2 is a partial side view obliquely from above of a bottom portion of a cabinet for plumbing and heating equipment according to the invention,
- Fig. 3 shows the same view as in Fig. 2 except that a sealing device is arranged at a flange end of the bottom portion of the cabinet,
- Fig. 4 shows a schematic view of the back side of the sealing device of Fig. 3 with the flanged end of the bottom portion shown transparent,
- Figs. 5a-5c show different embodiments of the sealing device provided with a sealing means, each in three different views, and
- Fig. 6 is a partial view of a sheet metal blank showing bending lines and radius for making the bottom portion shown in Figs. 2-4.

## Description of preferred embodiments

[0010] Fig. 1 show a prior art cabinet 1 for plumbing and heating equipment (not shown), the bottom part 2 and the upper part 3 of which is provided with pipe through-fittings 4.

[0011] Fig. 2 shows a right side part of a bottom portion 10 of the cabinet 1, which bottom portion is shown without pipe through-fittings. The cabinet including the bottom portion is formed from a sheet metal blank by stamping and bending suitable portions thereof. In Fig. 6 a part of the blank forming the bottom portion is shown. It should be noted that a corresponding left side portion of the bottom portion 10 is arranged at the finished bottom portion 10. The bottom portion 10 has a rear side 11, a front side 12, flanged ends 13 (only one of which is shown) and a bottom 14. Suitable connecting tongues 21, 24 are arranged at respective end of the rear side 11 and at respective end of the bottom 14.

[0012] In a preferred embodiment, after bending the rear side 11, the front side and the flanged ends 13 so as to form the bottom portion 10, the connecting tongue 21 is connected on one hand to the front side 12 and on the other hand to the connecting tongue 24. The connecting tongue 24 is connected to connecting tongue 21. See Fig. 6. The connecting tongues 21, 24 are connected to the above-mentioned parts by spot welding, for instance, or by any other suitable means such as by rivets, screws, etc. The purpose for this type of connection is to achieve a simple and inexpensive connection, although such connection between the parts forming the bottom portion will not be waterproof. However, this will reduce the cost for manufacturing the cabinet.

[0013] As can be inferred from Fig. 6, the rear side 11,

the front side 12, the flanged end 13, the connecting tongue 21 and the connecting tongue 24 are to be bent upwardly 90°, each with a bending radius R of 0.7 as an example.

**[0014]** According to the invention the so formed bottom portion 10 is made waterproof by providing a sealing device 30 at the inside of the opposite flanged ends 13 of the bottom portion 10. See Figs. 3 and 4. More particular, the sealing device 30 should have such size and shape that it is adapted, at its parts forming the side edges 31, the lower edge 32 and the rear side 33, to press against corresponding inside parts of the bottom portion 10, preferably via at least one sealing means 34.

**[0015]** As seen in Figs. 5a - 5c, the sealing device 30;30';30" has the general form of a sheet and is preferably provided with at least one sealing means 34;34';34". Said sealing device may be made of polypropylene, for instance, and said sealing means may be made of ethylene propylene diene monomer rubber (EPDM rubber), for instance.

**[0016]** In the embodiment shown in Fig. 5a, the sealing means 34 is formed as an O-ring 34, which is arranged to extend around the side edges 31, the lower edge 32, and the rear side 33 at an upper portion of the sealing device 30. Said O-ring is preferably placed in a groove, not shown. As is obvious for the man skilled in the art the sealing means 34 must not have a circular cross section, it can be oval, rectangular or square, for instance.

**[0017]** In the embodiment shown in Fig. 5b, the sealing means 34' is formed as a gasket 34' extending over the whole area of the rear side 33' of the sealing device 30'.

**[0018]** In the embodiment shown in Fig. 5c, the sealing means 34" is formed as a gasket 34" arranged around at least the perimeter edge of the rear side 33" of the sealing device 30".

**[0019]** The sealing device 30;30';30", as seen in the embodiments shown in Figs. 5a-5c, is provided with suitable attachments means 35;35';35" enabling said sealing device, via the sealing means 34;34';34", to be waterproof attached to the inside of the opposite flanged ends 13 of the bottom portion 10.

**[0020]** In the embodiment shown in Fig. 5a said attachment means 35 are in the form of studs 35 arranged at the lower edge 32 and respective side edge 31 of the sealing device 30 and on the side of the sealing means 34 not sealed by the same. Said attachment means 35 are adapted to be placed in corresponding holes (not shown) formed in the rear side 11, the front side 12, and the bottom 14 of the bottom portion 10.

**[0021]** In the embodiments shown in Figs. 5b,5c said attachment means 35';35" are in the form of threaded means 35';35" arranged at the rear side 33';33" of the sealing device 30';30" and adapted to be threaded through corresponding holes (not shown) in respective flanged end 13 of the bottom portion 10. The threaded means 35';35" may be fixed to said flanged end 13 by nuts, for instance.

**[0022]** By placing and fastening the sealing device

30;30';30" in the above-mentioned way the bottom portion 10 of the cabinet 1 will be waterproof.

**[0023]** In an embodiment not shown, the bottom portion 10 is formed as a tray which is either fixedly or loosely attached to a lower portion of the cabinet. Said tray is formed and sealed in the same way as the bottom portion 10 described above.

## 10 Claims

1. A cabinet (1) for plumbing and heating equipment having at least a bottom portion (10) provided with pipe through-fittings (4) and formed from a sheet metal blank by stamping and bending suitable portions thereof so as to form said bottom portion (10), said bottom portion(10) having a rear side (11), a front side (12), flanged ends (13) and a bottom (14) which are connected to each other in a non-waterproof way such as to form a rectangular bottom portion (10), **characterized in that** the bottom portion (10) at its opposite flanged ends (13) is provided with at least one sealing device (30;30';30") having such size and shape that it is adapted to press against the inside of the rear side (11), the front side (12), the flanged end (13) and the bottom (14) of the bottom portion (10) so as to enable the bottom portion (10) to be waterproof.
2. The cabinet (1) according to claim 1, **characterized in that** parts of the sealing device (30;30';30") adapted to press against the inside of the rear side (11), the front side (12), the flanged end (13) and the bottom (14) of the bottom portion (10) are provided with at least one sealing means (34;34';34").
3. The cabinet (1) according to claim 2, **characterized in that** said least one sealing means (34) is arranged to extend around a bottom edge (32), side edges (31) and a rear side (33) of an upper portion of the sealing device (30)
4. The cabinet (1) according to claim 2, **characterized in that** said at least one sealing means (34') is formed as a gasket (34') extending over the whole area of the rear side (33') of the sealing device (30').
5. The cabinet (1) according to claim 2, **characterized in that** said least one sealing means (34") is arranged around at least a perimeter edge (36") of the rear side (33") of the sealing device (30").
6. The cabinet (1) according to anyone of the claims 1-5, **characterized in that** said sealing device (30;30';30" ) is provided with attachments means (35;35';35") enabling the sealing device to be waterproof attached to the opposite flanged ends (13) of the bottom portion (10).

7. The cabinet (1) according to anyone of the claims 1-6, **characterized in that** said sealing device (30;30';30" ) has the general form of a sheet.

8. The cabinet (1) according to anyone of the claims 1-7, **characterized in that** the bottom portion (10) is formed as a tray (10) either fixedly or loosely attached to a lower portion of the cabinet (1).

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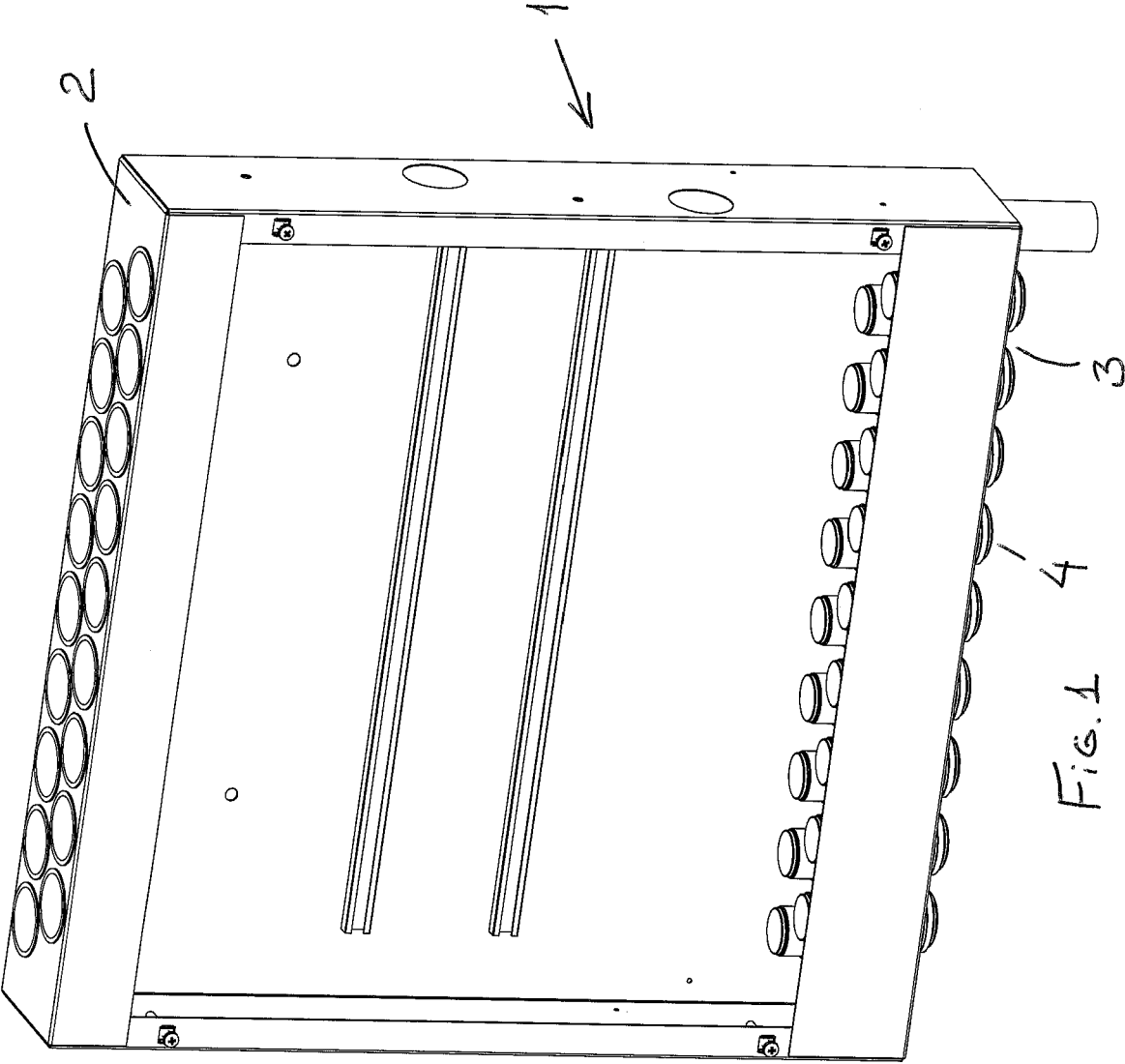
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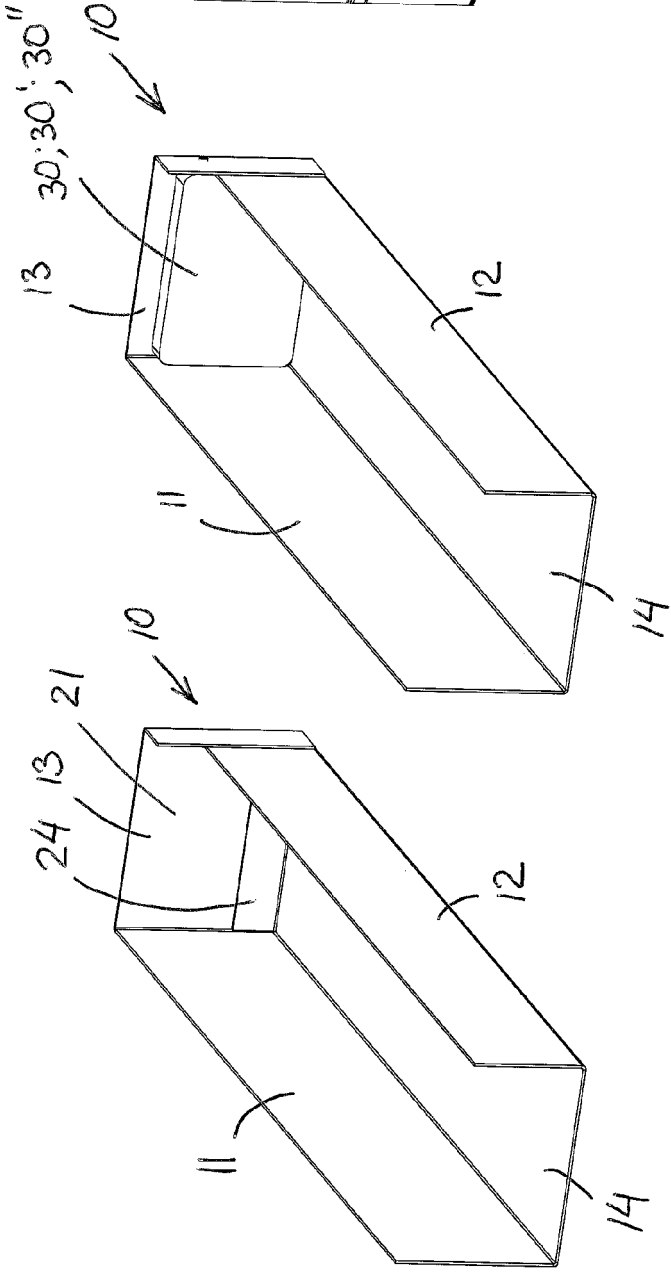


FIG. 2

FIG. 3

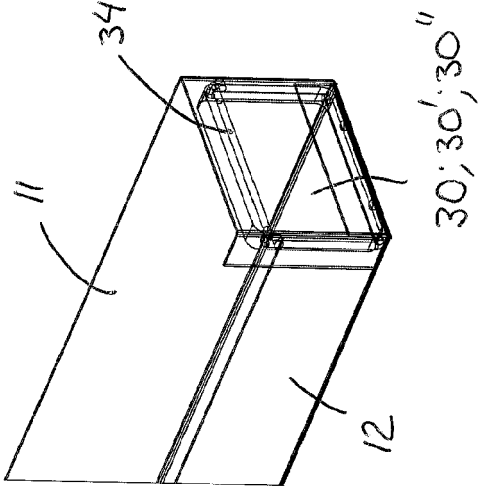


FIG. 4

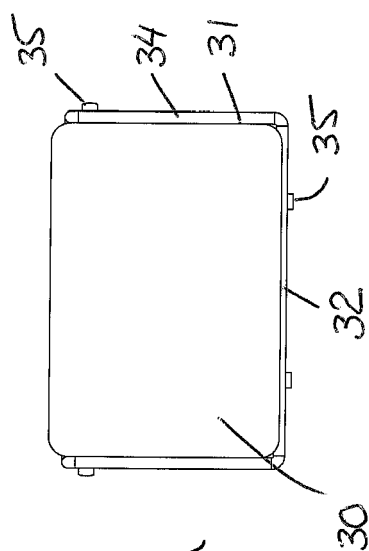
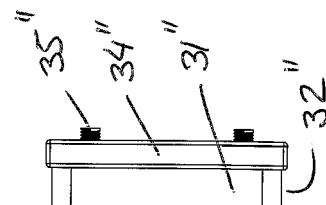
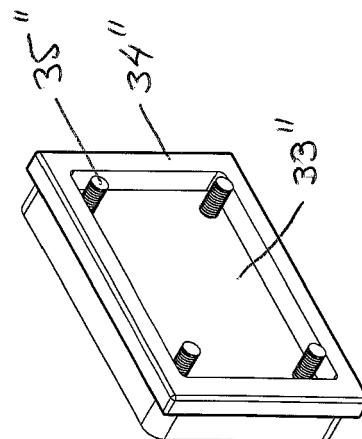
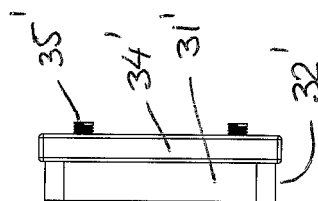
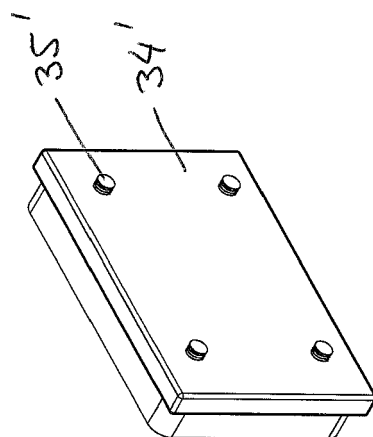
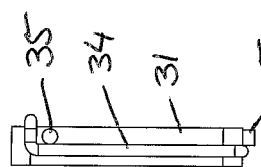
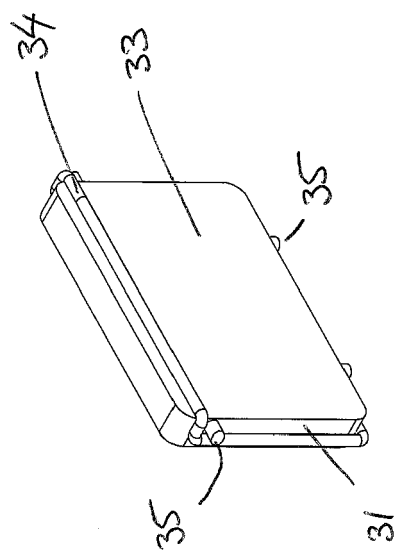


Fig. 5a

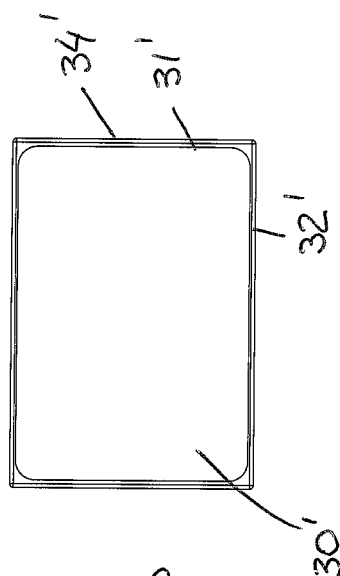


Fig. 5b

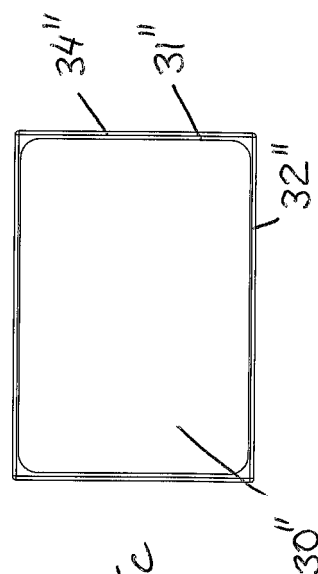


Fig. 5c

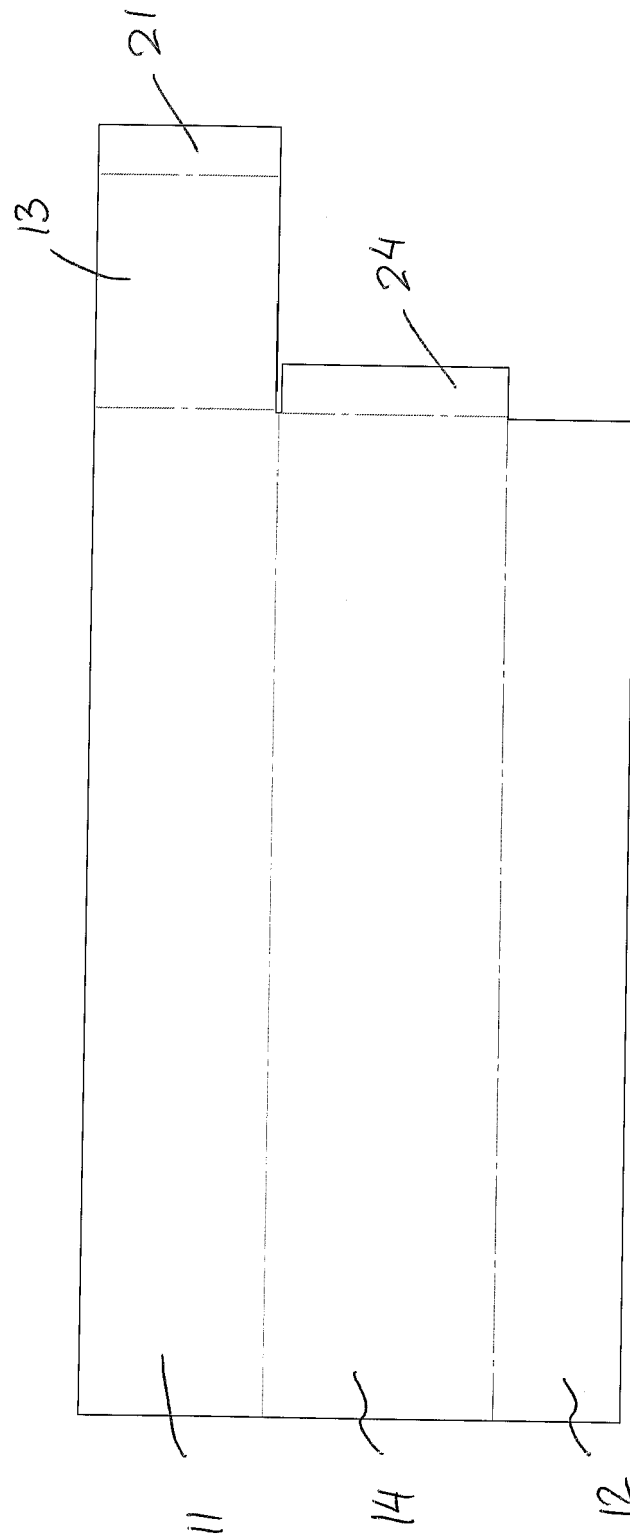


Fig. 6





## EUROPEAN SEARCH REPORT

Application Number  
EP 17 18 7193

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The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>15 December 2017</b>	Examiner <b>Schwaiger, Bernd</b>
<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>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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