chamber are also reduced. Furthermore, for the purpose of later expansions, the upper and lower closing can occur with flange-connected covers.

Although providing areas connected with flange joints according to the vacuum chamber described in ~~DE 94 940 22~~ DE 94 040 22 affords increased flexibility as regards changes or modifications of the vacuum chamber by comparison with integrally-formed vacuum chambers, the structural properties of the vacuum chamber pose a problem since it must be ensured that the chamber built by means of the flange-connected elements offers the required stability.

In contrast thereto, in an earlier application of the same applicant a vacuum chamber is disclosed which is built as a frame construction, wherein the base area of the frame and the struts are made of one piece. Additionally, the struts are formed by bending protruding arms of the panel vertically upwards and therefore in these areas no welding is necessary. Thus only the frame elements of the doors as well as of the cover panel are welded. The frame forms a structure for the chamber into which insert plates can be inserted to complete the chamber. It is possible to pre-assemble onto the insert plates attachments or in-built devices, such as for example pumps, target or source. The insert plates are connected with the frame mechanically and vacuum-tight. For the manufacture of several different vacuum chambers, frames can be standardized as modules in a large number and thus be produced at low cost. In the case of specific customer requirements, the frame no longer needs to be worked upon at all, as the customer specifications can be fully taken into account by adapting the insert plates. The functional elements provided for this purpose, such as for example target, source or vacuum pump, but for example also vision panels, can be arranged from one chamber to the next in a different manner in relation to one another.

However, in the construction – described above and known in the state of the art – of a vacuum chamber, one disadvantage lies in the fact that the panels necessary for building the frame must be sufficiently thin to allow the struts or the shell part of the frame to be bent, which then results in a reduced stability of the frame.

Claims

1. Vacuum chamber ~~(1)~~ for coating installations, ~~wherein~~ the vacuum chamber ~~(1) has~~ having a bottom plate ~~(6)~~ and a top plate ~~(2)~~, which are connected to each other by struts ~~(4) running substantially perpendicularly to the bottom plate (6) and the top plate (2)~~, wherein a plurality of openings ~~(9)~~ are defined by the bottom plate ~~(6)~~, the top plate ~~(2)~~ and the struts ~~(4)~~,
~~characterized in that~~wherein
at least a portion of a front edge ~~(15')~~ of the bottom plate ~~(6)~~ and a portion of the front edge ~~(15)~~ of the top plate ~~(2)~~ form together with two struts ~~(4)~~ a sealing area~~, running~~ for an insert plate that can be inserted in one opening of the plurality of openings, said sealing area framing around ~~one~~ the opening ~~(9) of the multiplicity of openings (9), for an insert plate (8) that can be inserted into the opening (9).~~, and wherein the top plate and the bottom plate are construed in such a manner that the front edges of these respective plates can be used themselves as sealing up counterpart of the insert plate, when the insert plate is provided in the opening.

2. Vacuum chamber ~~(1)~~ according to claim 1, ~~characterized in that~~ wherein the bottom plate ~~(6)~~ and/or the top plate ~~(2)~~ each have a thickness of at least 3 cm.

3. Vacuum chamber ~~(1)~~ according to claim 1 or 2, ~~characterized in that~~ wherein the bottom plate ~~(6)~~ and/or the top plate ~~(2)~~ are made in the form of a multi-angular plate.

4. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to 3, ~~characterized in that~~ wherein the bottom plate ~~(6)~~, the top plate ~~(2)~~ and the struts ~~(4)~~ form a prismatic body.

5. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to 4, ~~characterized in that~~ wherein the struts ~~(4)~~ are made in a polygonal section, in particular with a pentagonal profile.

6. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to 5, ~~characterized in that~~ wherein the bottom plate ~~(6)~~ and/or the top plate ~~(2)~~ are provided with centering holes at the positions where the respective struts ~~(4)~~ can be fastened thereto.

7. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to 6, ~~characterized in that~~ wherein the bottom plate ~~(6)~~ and/or the top plate ~~(2)~~ are provided with a tapered edge at the positions where the respective struts can be fastened thereto.

8. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to 7, ~~characterized in that~~ wherein the struts ~~(4)~~ are each provided with at least one threaded hole.

9. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to 8, ~~characterized in that~~ wherein the insert plates ~~(8) can be~~ are fastened to the struts ~~(4)~~ from the outside~~, and can in particular be screwed thereto by means of screws.~~

10. Vacuum chamber according to claim 9, wherein the insert plates are fastened to the struts from the outside by means of screws.

~~10~~11. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to ~~9~~10, ~~characterized in that~~ wherein the struts ~~(4)~~ are chamfered at their respective ends ~~(11)~~.

~~11~~12. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to ~~10~~11, ~~characterized in that~~ wherein the insert plates ~~(8)~~ are made of aluminum.

~~12~~13. Vacuum chamber ~~(1)~~ according to one or several of the claims 1 to ~~11~~12, ~~characterized in that~~ wherein a door ~~(14)~~ for opening and closing the vacuum chamber ~~(1)~~ is provided.

~~13~~14. Method for producing a vacuum chamber ~~(1)~~ according to any one of the preceding claims 1 to 13 for coating installations, ~~characterized in that~~ wherein the method comprises the following steps:

- putting together a frame which has a bottom plate ~~(6)~~, a top plate ~~(2)~~ and struts ~~(4)~~, which connect the bottom plate ~~(6)~~ and the top plate ~~(2), and~~
- welding the bottom plate ~~(6)~~ and the top plate ~~(2)~~ to the struts ~~(4).~~, and
- attaching insert plates to the frame.

~~14~~15. Method according to claim ~~13~~14, ~~characterized in that~~ wherein the assembled frame is held during welding in a supporting structure.

~~15~~16. Method according to claim ~~13 or~~ 14 or 15, ~~characterized in that~~ wherein after welding, the frame is milled and subsequently sandblasted.

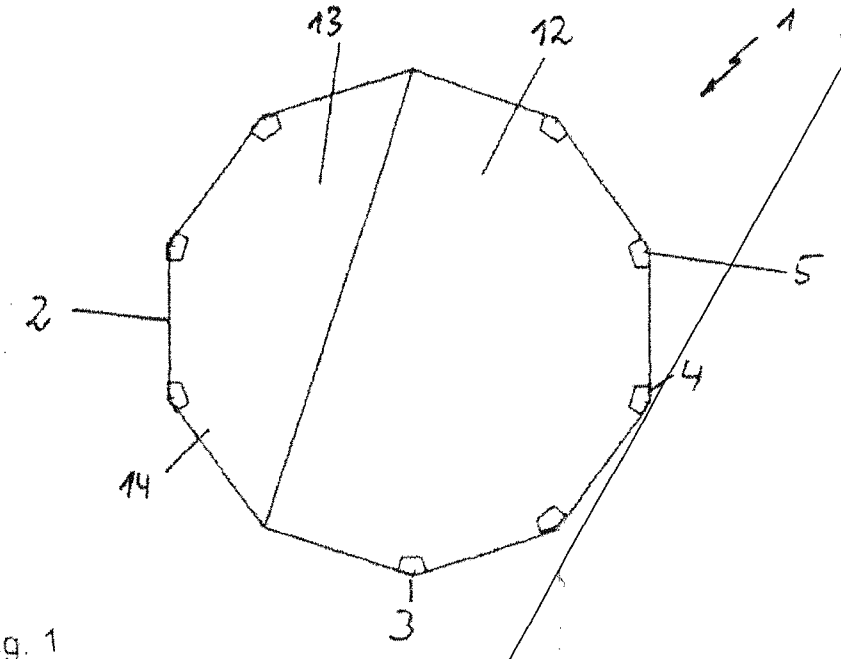


Fig. 1

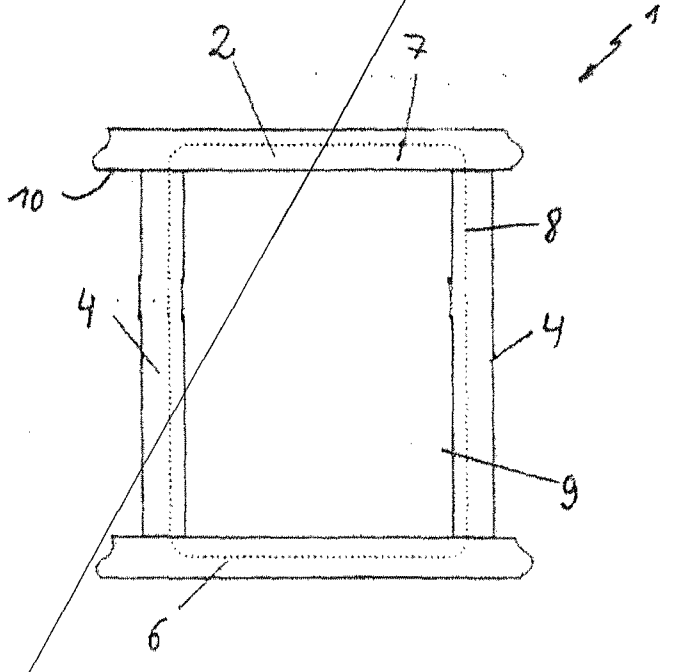


Fig. 2

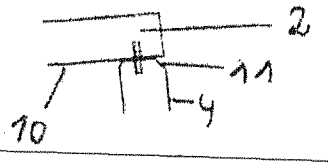


Fig. 3

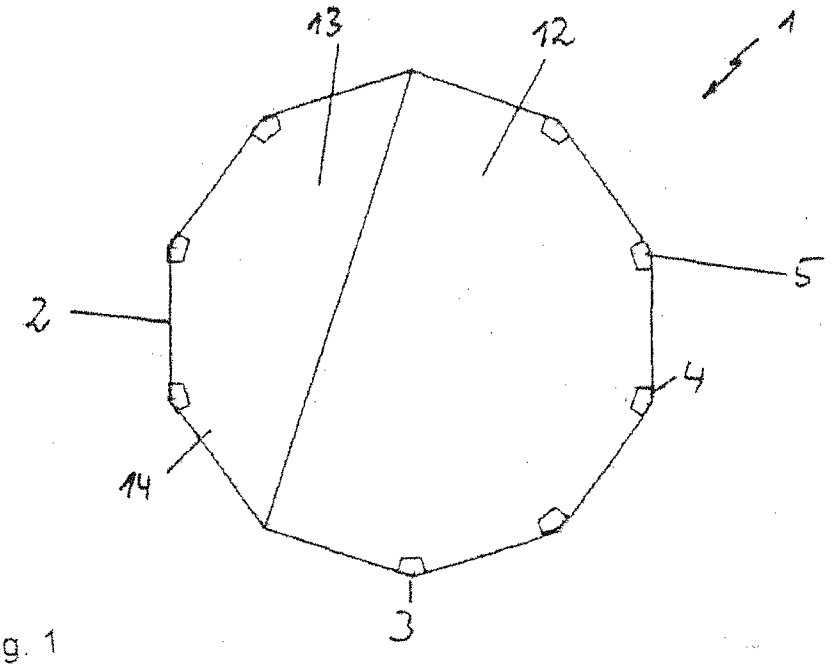


Fig. 1

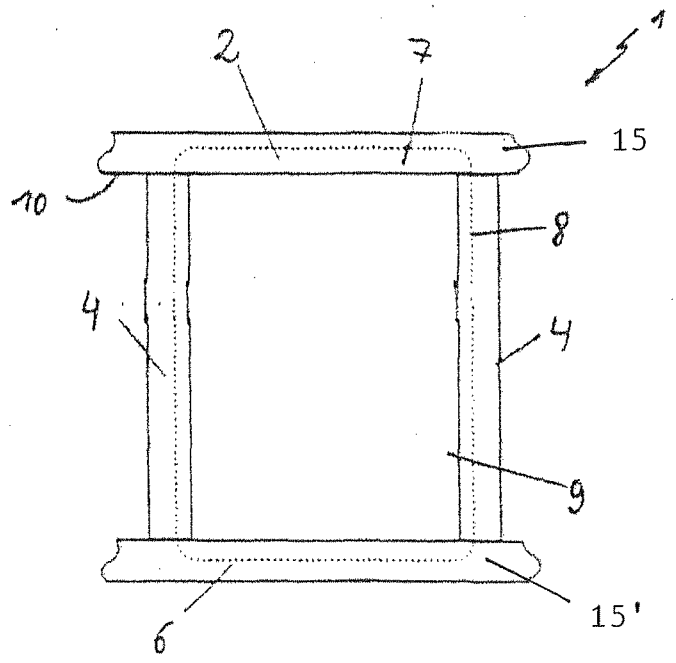


Fig. 2

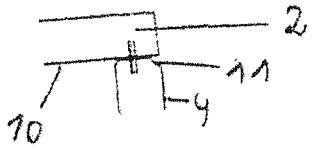


Fig. 3