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(54) Sharp-edged drainage channel

(57) The invention describes a drainage channel (301) for casting into a floor, wherein the drainage channel (301) is adapted along its longitudinal direction to conduct drain water towards a drain, and wherein the drainage channel (301) includes at least one concrete anchor (305) for fastening in the cast floor, and a concave shell form (303) including at least one upper edge (307) extending in longitudinal direction of the drainage channel, the upper edge (307) bordering the cast floor and which by casting of the drainage channel into the floor is located at or immediately under the surface level of the

floor. The edge (307) is sharp-edged (311) at a transition to an interface (315a, 315b) towards the floor, the interface being approximately parallel with the longitudinal centre plane (313) of the drainage channel. It is thereby avoided that the epoxy-floor will have cracks if cast up to the drainage channel or that a possible joint will be damaged. This means that the sealing between floor and drainage channel will be maintained in intact condition such that it is avoided that dirt and contaminants can penetrate down between the cast floor and the drainage channel such that optimal hygiene cannot be maintained.

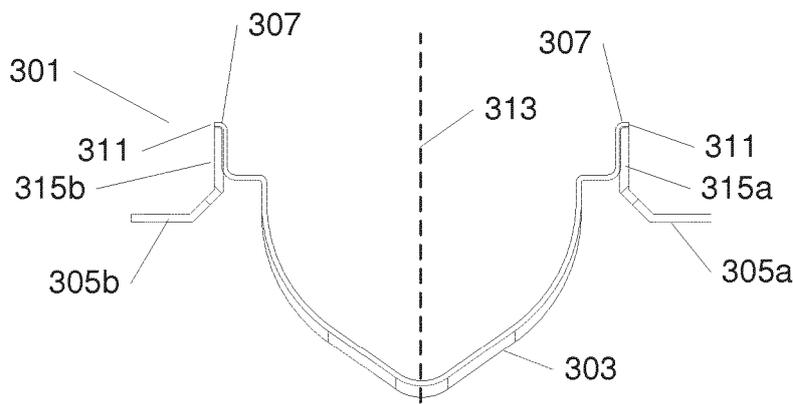


Fig. 3A

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Description

Scope of the Invention

[0001] The present invention concerns a sharp-edged drainage channel. The invention more specifically concerns a drainage channel for casting into a floor, wherein the drainage channel is adapted along its longitudinal direction to conduct drain water towards a drain, and wherein the drainage channel includes at least one concrete anchor for fastening in the cast floor, and a concave shell form including at least one upper edge extending in longitudinal direction of the drainage channel, the upper edge bordering the cast floor and which by casting of the drainage channel into the floor is located at or immediately under the surface level of the floor.

Background of the Invention

[0002] In connection with floor drains, e.g. in connection with wet rooms in production areas of slaughterhouses or similar, oblong drainage channels may be provided in the floor with a slope whereby excessive water is conducted to a drain via the drainage channels. Typically, oblong drain channels will thus be provided in the floor with the task of conducting water to one or more drains placed at strategic points in the production area. Wet rooms with such drain channels are e.g. frequently used in connection with breweries and slaughterhouses where the drain channels are cast into epoxy floors, and in places with heavy emphasis on optimal hygiene.

[0003] In order to achieve optimal hygiene it will be necessary to ensure that the transition between floor and grating is sufficiently tight in order to prevent dirt and water from penetrating down between the drainage channels and the floor, providing a breeding ground for bacterial growth. In order to ensure this, the floors are either cast right up to the drainage channels or a joint is usually added between the cast floor and the drainage channel.

[0004] The drainage channels typically consist of a concave shell form and one or more concrete anchors. The concrete anchors enhance retention of the drainage channels to the cast floor. The concrete anchors are often formed as an integrated part of the shell form, usually by bending the latter. The interface formed hereby between the drainage channel and the floor will be constituted by an inclining interface.

[0005] An example of a drainage channel of this type is known from EP 0 677 622 B 1. Herein is described a drainage channel where the upper edge is finished by a bent edge part. A radius of curvature appears in the bent metal sheet by the bending. The upper edge is thus not sharp-edged at the end.

[0006] If the floor surface is made of epoxy, the inclining interface often means that the epoxy will break, forming cracks that cannot be cleaned sufficiently. A similar situation is observed by pointing where an inclining interface will mean a joint that varies in thickness at the tran-

sition from the joint to the drainage channel where the joint becomes gradually thinner. The thinnest part of the joint will easily release the fastening to the drainage channel during daily use and cleaning. The joint will therefore flap up whereby sufficient cleaning no longer can be achieved. Moreover, this means that the joint will slowly become more and more loose whereby water and dirt will penetrate down between the drainage channel and the floor.

Object of the Invention

[0007] An object of the invention is to solve the above problems, including solving the problem of insufficient sealing at the transition from floor to drainage channel.

Description of the Invention

[0008] According to the present invention this is achieved by a drainage channel of the type mentioned in the introduction which is peculiar in that the edge is sharp-edged at a transition to an interface towards the floor, the interface being approximately parallel with the longitudinal centre plane of the drainage channel.

[0009] In the present patent application, by sharp-edged is meant an edge appearing by cutting off an end part of a sheet. The sheet thereby appears as a corner formed by an end face or section and a plane surface, and which is largely rectangular. It is therefore not a corner formed by bending a sheet. By such bending there will always appear a radius of curvature. The cutting can be performed by machining, by laser cutting or other suitable technique.

[0010] By having a sharp edge it is avoided that the epoxy-floor will get cracks if cast up to the drainage channel or that a possible joint will be damaged. This means that the sealing between floor and drainage channel will be maintained in intact condition such that it is avoided that dirt and contaminants penetrate down between the cast floor and the drainage channel such that optimal hygiene is not maintained.

[0011] This improvement is achieved in that the upper edge of the drainage channel is sharp-edged instead of rounded as by the prior art. This means that the sharp edge forms an interface towards the floor which is approximately straight instead of inclining. The interface will be about perpendicular to the surface of the floor in which the drainage channel is cast.

[0012] In an embodiment the at least one concrete anchor and the shell form are two separate elements. This means that the concrete anchor and the shell form are not formed of a single element, but they are formed separately and subsequently fastened to each other. This is a great advantage in production as it hereby becomes easier to produce a sharp edge that may function as an interface.

[0013] In an embodiment, the concrete anchor is fastened under the sharp-edged part of the drainage chan-

nel. Hereby it is achieved that the interface towards the floor is constituted by an approximately straight section so that sufficient sealing is achieved between the drainage channel and the floor, irrespective of the appearance of the concrete anchor.

[0014] In a further embodiment, the concrete anchor is fastened by means of all-welding. An efficient fastening of the concrete anchor to the shell form is hereby achieved whereby inadvertent separation of the concrete anchor from the shell form is prevented.

[0015] In one embodiment the concrete anchor is fastened to the shell form. The concrete anchor can hereby be secured in a desired position in relation to the shell form. Moreover, it is avoided that the concrete anchor is moving inexpediently relative to the shell form during the casting process.

[0016] In a further embodiment the concrete anchor is fastened by spot welding.

[0017] In an embodiment the concrete anchor includes a surface which is mounted in continuation of the interface of the edge. The interface is hereby extended by the surface from the concrete anchor, thus optimising the transition from drainage channel to floor/joint.

[0018] In an embodiment the surface of the concrete anchor is approximately parallel with the longitudinal centre plane of the drainage channel. This is particularly suitable in that the interface formed by the upper edge is extended by the surface of the concrete anchor in an approximately straight line which will be approximately perpendicular to the surface of the floor after casting the latter. The interface is extended hereby, and the area in which an efficient sealing can be achieved between floor and drainage channel is increased, and the sealing is made more durable.

[0019] In an embodiment, the drainage channel is made of stainless steel. This material is particularly suitable in connection with drains with respect to durability as well as hygiene.

Short Description of the Drawing

[0020] The invention will now be explained more closely with reference to the accompanying drawing, wherein:

Fig. 1 shows a cross-section of a drainage channel without sharp-edge upper edge (prior art);

Figs. 2A and 2B show interface in cases with drainage channel with and without sharp-edged upper edge, respectively;

Figs. 3A, 3B, 3C and 3D show an embodiment of a drainage channel with sharp-edged upper edge as seen from various angles; and

Figs. 4A, 4B, 4C, 4D and 4E show a further embodiment of a drainage channel with sharp-edged upper edge as seen from various angles.

Detailed Description of Embodiments of the Invention

[0021] Fig. 1 shows an example of prior art. Fig. 1 illustrates a drainage channel 101 including a shell form 103 and two concrete anchors 105a,b. The two concrete anchors 105a,b are designed integrated with the shell form 103 by bending of the latter. Hereby is formed an upper edge 107 which by casting of the drainage channel into a floor will be located at or immediately under the surface level of the floor. As the upper edge is formed by bending, it will consist of rounded edges whereby an inclining interface 109 with the floor is formed. It will be difficult therefore to achieve a permanent and stable sealing between the drainage channel and the cast floor.

[0022] Fig. 2A shows the interface when it is inclining where a transition from floor material or joint filler 201a to the upper edge 207a of the drainage channel appears. Right at the tip there will be a very thin layer of floor material or joint filler which can come loose. Fig. 2B shows a transition to the edge of a drainage channel according to the invention where floor material or joint filler 201b abuts on an upper edge 207b which is sharp-edged, thereby avoiding the gradual transition and the associated problems.

[0023] Figs. 3A-D illustrate a first embodiment of a drainage channel 301 with a sharp-edged upper edge 307 as seen from various angles, where Fig. 3A is a cross-section, Fig. 3B is viewed obliquely from above, Fig. 3C is a view from above, and Fig. 3D is a view from the side. The drainage channel includes a concave shell form 303 and two concrete anchors 305a,b. The shell form 303 has an upper edge 307 that is sharp-edged 311. The sharp-edged upper edge 311 forms a first interface towards the floor during casting which is approximately parallel with the longitudinal centre plane 313 of the drainage channel.

[0024] The two concrete anchors 305a,b are fastened to the shell form under the sharp-edged upper edge 307. The concrete anchors 305a,b can be fastened by means of an all-welding between the sharp-edged upper edge 307 and the concrete anchor 305a,b. Moreover, the concrete anchor 305a,b can be fastened to the shell form by means of a spot welding between the concrete anchor 305a,b and the shell form 303.

[0025] In the illustrated embodiment, the concrete anchors 305a,b include a surface 315a,b in continuation of the interface 311 of the upper edge. This surface 315a,b is approximately parallel with the longitudinal centre plane 313 of the drainage channel. The interface is hereby extended towards the floor during the casting process and retention of the drainage channel is improved.

[0026] Figs. 4A-D illustrate a first embodiment of a drainage channel 401 with a sharp-edged upper edge 407 as seen from various angles, where Fig. 4A is a cross-section, Fig. 4B is viewed obliquely from above from one side, Fig. 4C is a view obliquely from above from the other side, and Fig. 4D is a view from above.

The drainage channel includes a concave shell form 403 and a concrete anchor 405. The shell form 403 has an upper edge 407 which is sharp-edged 411. The sharp-edged upper edge 411 forms a first interface towards the floor during casting which is approximately parallel with the longitudinal centre plane 413 of the drainage channel.

[0027] As opposed to the embodiment illustrated in Figs. 3A-D, the embodiment in Figs. 4A-E has an extended sharp edge 411 and thereby a large interface towards the floor during the casting process, whereby retention of the drainage channel is improved.

[0028] The concrete anchor 405 is fastened to the shell form 403 under the sharp-edged upper edge 407 by fastening to a flange 417 formed by bending the shell form 403.

[0029] The invention is not limited to the embodiments shown in the Figures and described above. Other embodiments with other shapes of the sharp-edged drainage channel may be envisaged within the scope of this invention and the subsequent claims.

Claims

1. A drainage channel (301) for casting into a floor, wherein the drainage channel (301) along its longitudinal direction is adapted to conduct drain water towards a drain, and wherein the drainage channel (301) includes at least one concrete anchor (305) for fastening in the cast floor, and a concave shell form (303) including at least one upper edge (307) extending in longitudinal direction of the drainage channel, the upper edge (307) bordering the cast floor and which by casting of the drainage channel into the floor is located at or immediately under the surface level of the floor, **characterised in that** the edge (307) is sharp-edged (311) at a transition to an interface (315a, 315b) towards the floor, the interface being approximately parallel with the longitudinal centre plane (313) of the drainage channel.
2. Drainage channel (301) according to claim 1, **characterised in that** the at least one concrete anchor (305) and the shell form (303) are two separate elements.
3. Drainage channel (301) according to claim 2, **characterised in that** the concrete anchor (305) is fastened under the sharp-edge part (311) of the drainage channel (301).
4. Drainage channel (301) according to claim 3, **characterised in that** the concrete anchor (305) is fastened by means of all-welding.
5. Drainage channel (301) according to claim 2-4, **characterised in that** the concrete anchor (305) is fastened to the shell form (303).
6. Drainage channel (301) according to claim 5, **characterised in that** the concrete anchor (305) is fastened by spot welding.
7. Drainage channel (301) according to claim 1 - 6, **characterised in that** the concrete anchor (305) includes a surface (315) which is mounted in continuation of the interface (311) of the edge.
8. Drainage channel (301) according to claim 7, **characterised in that** the surface (315) of the concrete anchor is approximately parallel with the longitudinal centre plane (313) of the drainage channel.
9. Drainage channel (301) according to claim 1 - 8, **characterised in that** the drainage channel (301) is made of stainless steel.

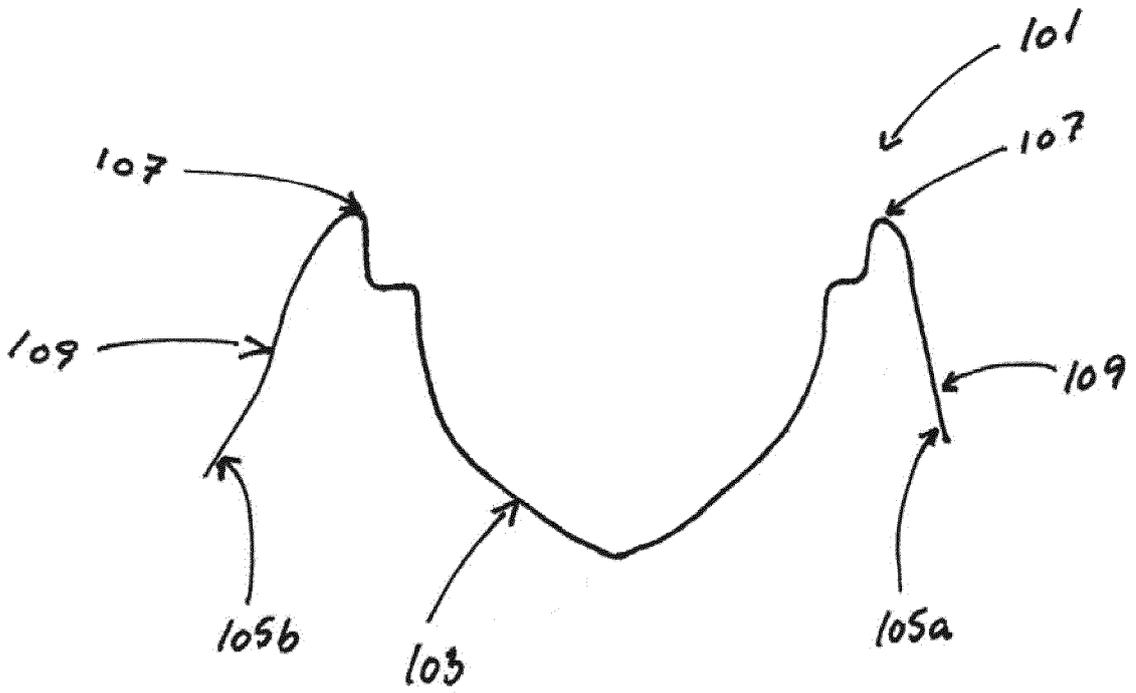


Fig. 1

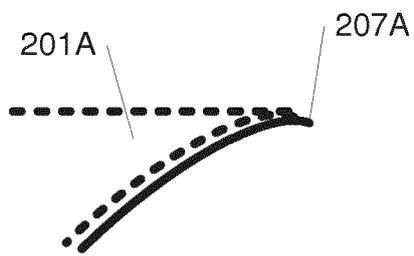


Fig. 2A

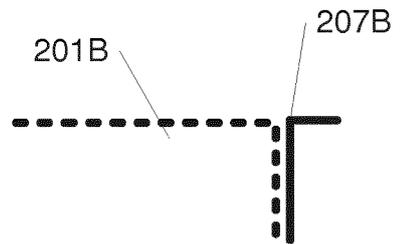


Fig. 2B

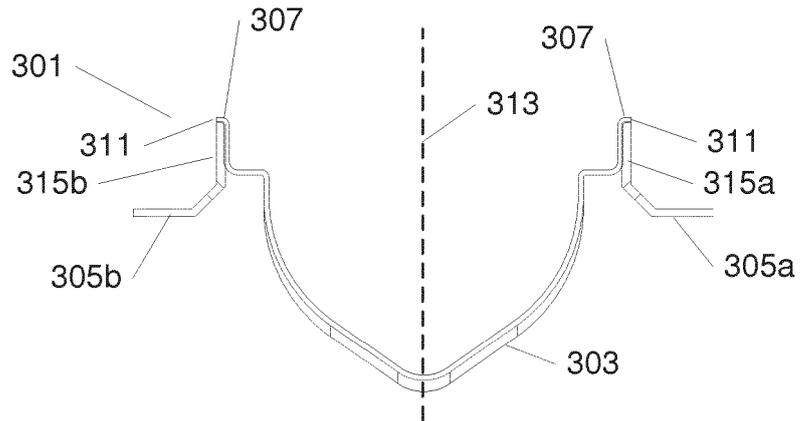


Fig. 3A

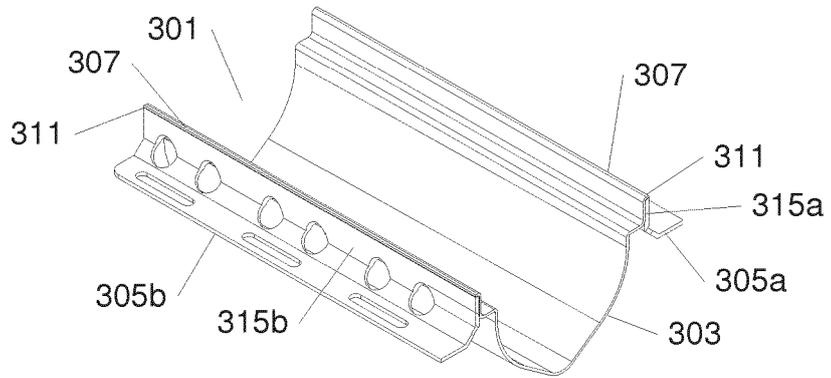


Fig. 3B

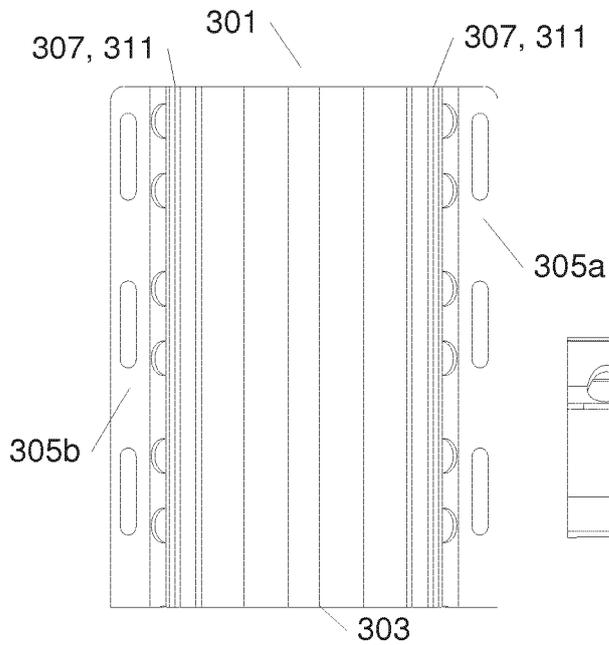


Fig. 3C

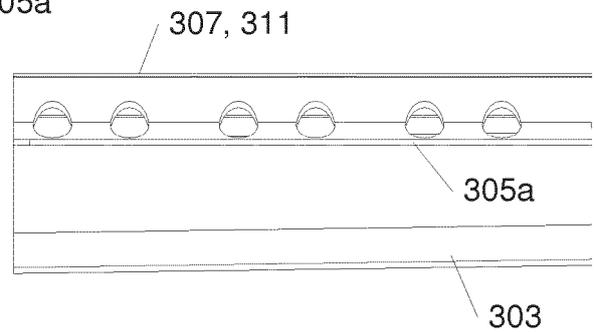


Fig. 3D

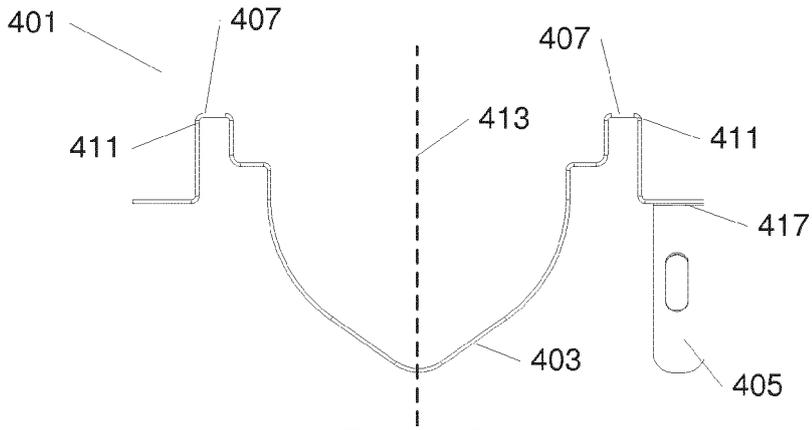


Fig. 4A

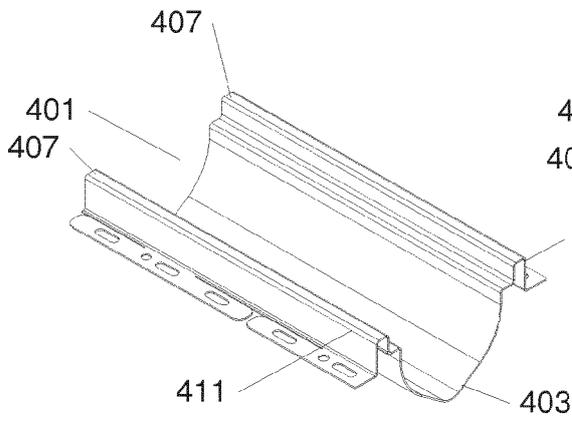


Fig. 4B

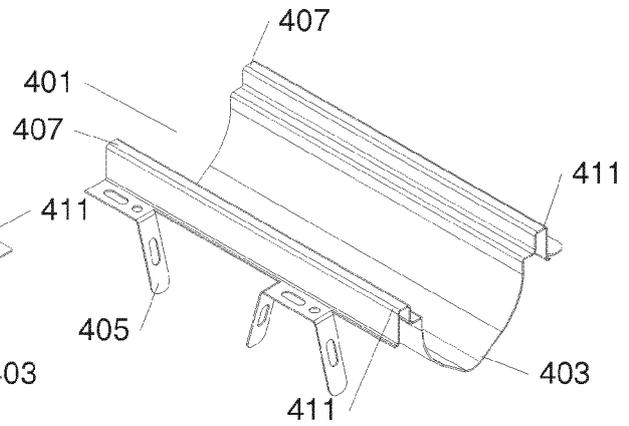


Fig. 4C

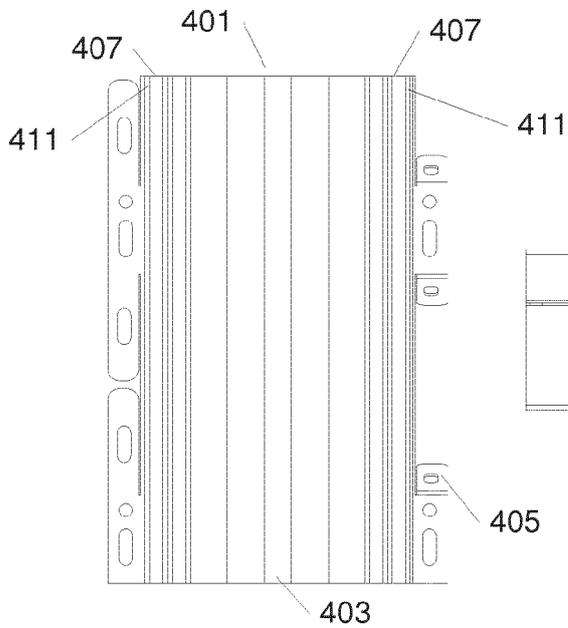


Fig. 4D

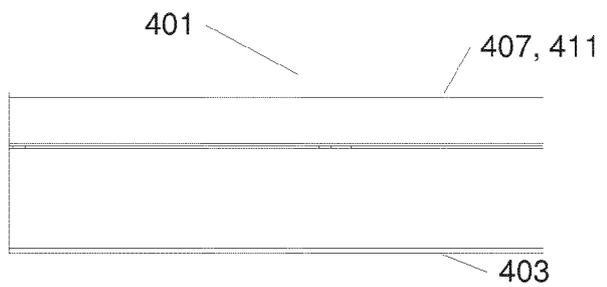


Fig. 4E



EUROPEAN SEARCH REPORT

Application Number
EP 14 15 8659

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X	----- EP 0 893 545 A2 (BLUECHER METAL HKT GMBH [DE] BLUECHER METAL HKT GMBH BLUECHER GERMANY) 27 January 1999 (1999-01-27) * figures 1,4,5 *	1-9	
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X,D	----- EP 0 677 622 A2 (WILHELM HAFNER GMBH [DE]) 18 October 1995 (1995-10-18) * figures 1,3,5 *	1-9	
			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 30 April 2014	Examiner Isailovski, Marko
CATEGORY OF CITED DOCUMENTS 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		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 ----- & : member of the same patent family, corresponding document	

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30-04-2014

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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