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(54) **A radiator and a related intermediate connection piece**

(57) The present invention is a radiator (10) comprising a grid (30); lateral covers (40a, 40b); an intermediate connection piece (20) for connecting said grid (30) and lateral covers (40a, 40b) into each other; and connection means provided on the grid (30), on the lateral covers (40a, 40b) and on said intermediate connection piece (20), characterized by comprising an opening (34) provided at the tip of the grid (30); at least one connection member (33) which extends towards the intermediate connection piece (20) around said opening (34); a connection member (25) which is provided on the intermediate connection piece (20) and which has at least one grabbing part (252) which grabs said connection member (33); at least one connection member (45) which is provided around the lateral cover's (40) end facing the grid (30); and another connection member (26) which is provided on the intermediate connection piece (20) and which has at least one grabbing part (262) which grabs the connection member (45).

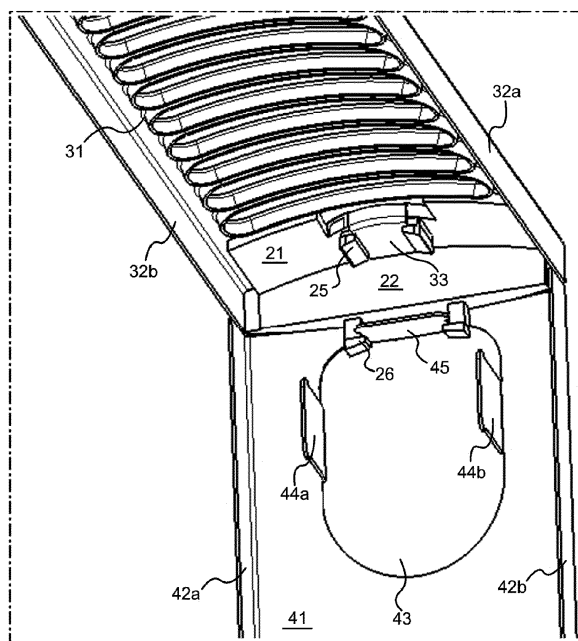


Figure 6

Description

TECHNICAL FIELD

[0001] The present invention relates to a radiator and an intermediate connection piece which is used for connecting the radiator grid and lateral covers thereof and which provides advantages in terms of appearance and application.

PRIOR ART

[0002] Radiators essentially comprise lateral panels; lateral covers which connect said lateral panels to each other and which accommodate the inlet and outlet holes of water lines; grids which are positioned so as to cover said lateral covers and lateral panels.

[0003] Grids can be manufactured so that the edges thereof form a closed form. In such a case, for each different grid, a separate mould may have to be formed and separate removal-fixation steels may be required. All of these cases lead to additional labor and increase production costs. Moreover, closed grid production leads to more sheet consumption when compared with open grid production and this leads to an increase in production costs.

[0004] Grids can be produced so that the edges thereof are open. In this case, the lateral covers are placed by being closed onto the open edges of the grid. The radiators, produced in this manner, are insufficient in terms of aesthetic appearance when compared with the radiators which have grids produced in closed form. Moreover, since the lateral covers are produced in a closed form, there are additional labor costs and production costs resulting from extra sheet usage.

[0005] In the present art, the connection pieces, which are the subject of the patent EP 0863370, can be used. In said patent, an additional connection piece, which is used for joining the grid and lateral covers, is placed in a snap-fit manner inside the grid and inside the lateral covers. The corner part of said connection member forms an open form, and in order to cover said opening, a corner member is placed to the opening. Said connection piece necessitates the extending of the dimension of the radiator. Moreover, the corner member used forms an additional production step and thereby it can affect the production costs.

[0006] As a result, because of the abovementioned problems, an improvement is required in the related technical field.

BRIEF DESCRIPTION OF THE INVENTION

[0007] The present invention relates to a radiator with an intermediate connection piece which provides the grid and the lateral covers to be produced using the roll forming method and at the same time which provides an aesthetical appearance to the radiator obtained, in order to

eliminate the abovementioned problems and to bring new advantages to the related technical field.

[0008] The main object of the present invention is to provide a radiator intermediate connection piece which is used in the joining of the grid and of the lateral covers.

[0009] Another object of the present invention is to provide a radiator where the grid and the lateral covers are produced using the roll forming method, in order to decrease the production costs.

[0010] Another object of the present invention is to provide a one-piece radiator intermediate connection piece which is embodied in an uninterrupted manner and without elevation, in order to provide an aesthetical appearance particularly in the grid part of the radiator.

[0011] In order to realize all of the abovementioned objects and the objects which are to be obtained from the detailed description below, the present invention is a radiator comprising a grid; lateral covers; an intermediate connection piece for connecting said grid and lateral covers to each other; and connection means provided on the grid, on the lateral covers and on said intermediate connection piece. Accordingly, said radiator is characterized by comprising an opening provided at the tip of the grid; at least one connection member which extends towards the intermediate connection piece around said opening; a connection member which is provided on the intermediate connection piece and which has at least one grabbing part which grabs said connection member; at least one connection member which is provided around the lateral cover's end facing the grid; and another connection member which is provided on the intermediate connection piece and which has at least one grabbing part which grabs the connection member.

[0012] In a preferred embodiment of the subject matter invention, the intermediate connection piece and correspondingly, the connection members of the grid are provided at a substantially far point from the walls of the grid.

[0013] In another preferred embodiment of the subject matter invention, the intermediate connection piece and correspondingly, the connection members of the lateral cover are provided at a substantially far point from the walls of the lateral cover.

[0014] In another preferred embodiment of the subject matter invention, the intermediate connection piece comprises an upper part where the connection member is provided so as to extend towards the radiator; and a lateral part where the other connection member is provided so as to extend towards the radiator and which extends at a certain angle and particularly at an orthogonal angle with respect to the upper part.

[0015] In another preferred embodiment of the subject matter invention, the related connection member of the intermediate connection piece comprises grabbing parts which are positioned mutually so as to define a grabbing housing which will grab the connection member on the grid.

[0016] In another preferred embodiment of the subject matter invention, the related connection member of the

intermediate connection piece comprises grabbing parts which are positioned mutually so as to define a grabbing housing which will grab the connection member on the lateral cover.

[0017] In another preferred embodiment of the subject matter invention, the connection member on the grid extends substantially parallel to the extension direction of the lateral cover.

[0018] In another preferred embodiment of the subject matter invention, the connection member on the lateral cover extends substantially parallel to the extension direction of the grid.

[0019] In another preferred embodiment of the subject matter invention, said intermediate connection piece comprises at least one corner part which is one piece with the upper part and the lateral part; and which extends so as to have no tab and so as to be in the same alignment with the lateral cover and with the grid.

[0020] In another preferred embodiment of the subject matter invention, the connection members on said intermediate connection piece comprise connection parts which provide the connection of the connection members to the intermediate connection piece.

[0021] In another preferred embodiment of the subject matter invention, said connection member comprises a connection part; a placement part which extends at the continuation of said connection part and which is placed to the grabbing housing of the connection member; and locking tabs which are embodied by the extension of the placement part and which exist on the end of said placement part.

[0022] In another preferred embodiment of the subject matter invention, said connection member comprises a placement part which is embodied at the hole part of the lateral cover and which is placed to the grabbing housing of the connection member; and locking tabs which are embodied by the widening of said placement part.

[0023] In another preferred embodiment of the subject matter invention, said intermediate connection piece defines a hollow rectangular prism form which comprises an upper part, a lateral part and a corner part.

[0024] In another preferred embodiment of the subject matter invention, said grid and lateral covers are produced using the roll forming method.

[0025] In another preferred embodiment of the subject matter invention, the intermediate connection piece is made of plastic material.

[0026] In another preferred embodiment of the subject matter invention, said intermediate connection piece comprises an upper part with rectangular or curved forms so as to be compliant with the grid opening.

[0027] In another preferred embodiment of the subject matter invention, said grid comprises at least one recess wherein the connection members are positioned and which extends from the opening towards the radiator.

BRIEF DESCRIPTION OF THE FIGURES

[0028]

5 In Figure 1, the general view of the subject matter radiator is given.

10 In Figure 2a and 2b, the general view of the intermediate connection piece of the subject matter radiator is given.

In Figure 3, the detailed view of the subject matter radiator grid is given.

15 In Figure 4, the detailed view of the subject matter radiator lateral cover is given.

20 In Figure 5, the detailed view of the assembly of the intermediate connection piece of the subject matter radiator is given.

In Figure 6, another detailed view of the assembly of the intermediate connection piece of the subject matter radiator is given.

25 In Figure 7a and 7b, an embodiment alternative to Figure 2a and 2b is given.

30 In Figure 8, an embodiment alternative to Figure 3 is given.

REFERENCE NUMBERS

[0029]

35 10 Radiator
20 Intermediate Connection Piece

40 21 Upper Part
22 Lateral Part
23 Corner Part
24 Corner Part
25 Connection Member

45 251 Connection Part
252 Grabbing Part
253 Grabbing Housing

50 26 Connection Member

261 Connection Part
262 Grabbing Part
263 Grabbing Housing

55 30 Grid

31 Upper Piece
32a Wall

32b Wall
 33 Connection Member

 331 Connection Part
 332 Placement Part
 333 Locking Tab

34 Opening
 35 Recess

40 Lateral Cover

41 Upper Piece
 42a Wall
 42b Wall
 43 Hole Part
 44 Fittings Connection
 45 Connection Member

451 Placement Part
 452 Locking Tab

50 Lateral Panel

THE DETAILED DESCRIPTION OF THE INVENTION

[0030] In this detailed description, the radiator (10) comprising the subject matter intermediate connection piece (20) is explained with references to examples without forming any restrictive effect in order to make the subject more understandable.

[0031] The radiator (10), whose general view is given in Figure 1, essentially comprises lateral panels (50a, 50b); a lateral cover (40) which is connected to said lateral panels (50a, 50b); a grid (30) which is seated onto said lateral cover (40) and onto the lateral panels (50a, 50b); and intermediate connection piece (20) which is positioned in the region where said grid (30) and the lateral cover (40) join. The grid (30) and the lateral cover (40) are shaped using the roll forming method, and the opening, formed in between, is covered by the intermediate connection piece (20). Thus, the grid (30) and the lateral cover (40) are connected to each other.

[0032] With reference to Figure 3, the grid (30) comprises an upper piece (31) whereon spaces are embodied; and walls (32a, 32b) which are embodied so as to be substantially orthogonal to the upper piece (31) on the edges of the upper piece (31) along the length of said upper piece (31). On the end of the upper piece (31), there is an opening (34), there is a recess (35) which extends from said opening (34) towards the radiator (10); and there is at least one connection member (33) embodied in the vicinity of said recess (35). Said connection member (33) is embodied together with the grid (30) and the connection member (33) comprises a connection part (331); a placement part (332); and locking tabs (333a, 333b). Said connection part (331) is the part which connects the grid (30) and said placement part (332). Said

locking tabs (333a, 333b) are embodied at the end of the placement part (332) as a result of the widening of the placement part (332).

[0033] With reference to Figure 4, the lateral cover (40) comprises an upper piece (41); and walls (42a, 42b) embodied so as to be substantially orthogonal to the upper piece (41), on the edges of the upper piece (41) along the length of said upper piece (41). There is a hole part (43) which is embodied at one end of the upper piece (41). On said hole part (43), fittings connections (44a, 44b) are embodied which extend towards inside of the radiator (10). At the vicinity of the lateral cover's (40) end facing the grid (30), there is at least one connection member (45) embodied on the hole part (43). Said connection member (45) comprises a placement part (451) and locking tabs (452a, 452b). Said locking tabs (452a, 452b) are embodied at the end of the placement part (451) as a result of the widening of the placement part (451).

[0034] The opening formed between the grid (30) and the lateral cover (40) is closed by means of the intermediate connection piece (20) which is made of plastic material. The intermediate connection piece (20), whose view is given in Figure 2a and 2b, is essentially in the form of a hollow rectangular prism form comprising upper part (21), lateral part (22) and corner parts (23, 24). On the intermediate connection piece (20), there is at least one connection member (25) embodied on the inner region of the upper part (21) and there is at least one connection member (26) embodied on the inner region of the lateral part (22).

[0035] Said connection member (25) accommodates connection parts (251a, 251b) which connect the connection member (25) and the upper part (21) to each other; and grabbing parts (252a, 252b) which extend substantially orthogonally to said connection parts (251a, 251b) and which are embodied at the continuation of the connection parts (251 a, 251 b) and where the placement part (332) is seated. Moreover, in order to delimit the movement of the placement part (332), there is grabbing housing (253) which is defined by the grabbing parts (252a, 252b) and where the placement part (332) extends.

[0036] Said connection member (26) accommodates connection parts (261a, 261b) which connect the connection member (26) and the lateral part (22) to each other; and grabbing parts (262a, 262b) which extend substantially orthogonally to said connection parts (261a, 261 b) and which are embodied at the continuation of the connection parts (261 a, 261 b) and where the placement part (451) is seated. Moreover, in order to delimit the movement of the placement part (451), there is grabbing housing (263) which is defined by the grabbing parts (262a, 262b) and where the placement part (451) extends.

[0037] By means of a connection member (25) which exists in the structure of the intermediate connection piece (20), the intermediate connection piece (20) is connected to the connection member (33) on the grid (30),

and by means of another connection member (26), the intermediate connection piece (20) is connected to the connection member (45) on the lateral cover (40).

[0038] The connection parts (251 a, 251 b) of the connection member (25), where the connection member (33) on the grid (30) is placed, provide the connection of the intermediate connection piece (20) and the grabbing parts (252a, 252b). The grabbing parts (252a, 252b) have a tab form and they hold the placement part (332) of the connection member (33) by encompassing the placement part (332) from two sides. The locking tabs (333a, 333b) of the connection member (33) on the grid (30) remain outside of the grabbing parts (252a, 252b) and they prevent the placement part (332) from removing from between the grabbing parts (252a, 252b) by moving backwardly.

[0039] The connection parts (261 a, 261 b) of the connection member (26), where the connection member (45) of the lateral cover (40) is placed, provide the connection of the intermediate connection piece (20) and the grabbing parts (262a, 262b). The grabbing parts (262a, 262b) have an extension form and they hold the placement part (451) of the connection member (45) by encompassing the placement part (451) from two sides. Meanwhile, the placement part (451) is placed inside said grabbing housing (263). The locking tabs (452a, 452b) of the connection member (45) remain outside of the grabbing parts (262a, 262b) and they prevent the placement part (451) from removing from between the grabbing parts (262a, 262b) by moving backwardly. Moreover, the connection member (45) of the lateral cover is placed to the grabbing housing (263).

[0040] In Figure 8, an alternative embodiment of the grid (30) where the intermediate connection piece (20), whose view is given in Figure 3, is assembled can be seen. In the alternative embodiment of said grid (30), the opening (34) of the grid (30) where the connection member (33) is connected is embodied so as to comprise a circular form and so as to be different from the above-mentioned grid (30).

[0041] In Figure 7a and 7b, the alternative embodiment of the intermediate connection piece (20), whose view is given in Figure 2a and 2b, can be seen. In the alternative embodiment of said intermediate connection piece (20), there is a circular upper part (21) which is embodied so as to be compliant with the grid (30) opening (34), whose view is given in Figure 8, and so as to be different from the abovementioned intermediate connection piece (20).

[0042] Since all of the connection members (25, 26, 33, 45) in the subject matter invention extend inside the present volumes, for the usage of the intermediate connection piece (20), the grid (30) and the lateral cover (40) does not have to be kept at a distance beyond the standard according to the radiator (10) panels. In more details, the connection member (25) of the grid (30) and correspondingly of the intermediate connection piece (20) extends in the inner volume of the intermediate connection piece (20), on the other hand, the connection member

(26) of the lateral cover (40) and correspondingly of the intermediate connection piece (20) extends in the present inner volume of the radiator (10). Thus, without enlarging the dimension of the present radiator (10), an efficient solution is provided. Moreover, since the subject matter intermediate connection piece (20) is one piece, the production thereof is easier and the cost thereof is lower. In addition to these, thanks to the subject matter connection style, the lateral panel (50) and the grids (30) can be produced using the roll forming method and using single mould, and this substantially decreases the production costs per product.

[0043] The protection scope of the present invention is set forth in the annexed Claims and cannot be restricted to the illustrative disclosures given above, under the detailed description. It is because a person skilled in the relevant art can obviously produce similar embodiments under the light of the foregoing disclosures, without departing from the main principles of the present invention.

Claims

1. A radiator (10) comprising a grid (30); lateral covers (40a, 40b); an intermediate connection piece (20) for connecting said grid (30) and lateral covers (40a, 40b) into each other; and connection means provided on the grid (30), on the lateral covers (40a, 40b) and on said intermediate connection piece (20), **characterized by** comprising an opening (34) provided at the tip of the grid (30); at least one connection member (33) which extends towards the intermediate connection piece (20) around said opening (34); a connection member (25) which is provided on the intermediate connection piece (20) and which has at least one grabbing part (252) which grabs said connection member (33); at least one connection member (45) which is provided around the lateral cover's (40) end facing the grid (30); and another connection member (26) which is provided on the intermediate connection piece (20) and which has at least one grabbing part (262) which grabs the connection member (45).
2. A radiator (10) according to Claim 1, **characterized in that** the intermediate connection piece (20) and correspondingly, the connection members (25, 33) of the grid (30) are provided at a substantially far point from the walls (32a, 32b) of the grid (30).
3. A radiator (10) according to Claim 1, **characterized in that** the intermediate connection piece (20) and correspondingly, the connection members (26, 45) of the lateral cover are provided at a substantially far point from the walls (42a, 42b) of the lateral cover (40).
4. A radiator (10) according to any one of the preceding

- claims, **characterized in that** the intermediate connection piece (20) comprises an upper part (21) where the connection member (25) is provided so as to extend towards the radiator (10); and a lateral part (22) where the other connection member (26) is provided so as to extend towards the radiator (10) and which extends at a certain angle and particularly at an orthogonal angle with respect to the upper part (21).
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5. A radiator (10) according to any one of the preceding claims, **characterized in that** the related connection member (25) of the intermediate connection piece (20) comprises grabbing parts (252a, 252b) which are positioned mutually so as to define a grabbing housing (253) which will grab the connection member (33) on the grid (30).
 6. A radiator (10) according to any one of the preceding claims, **characterized in that** the related connection member (26) of the intermediate connection piece (20) comprises grabbing parts (262a, 262b) which are positioned mutually so as to define a grabbing housing (263) which will grab the connection member (45) on the lateral cover (40).
 7. A radiator (10) according to any one of the preceding claims, **characterized in that** the connection member (33) on the grid extends substantially parallel to the extension direction of the lateral cover (40).
 8. A radiator (10) according to any one of the preceding claims, **characterized in that** the connection member (45) on the lateral cover (40) extends substantially parallel to the extension direction of the grid (20).
 9. A radiator (10) according to any one of the preceding claims, **characterized in that** said intermediate connection piece (20) comprises at least one corner part (23, 24) which is one piece with the upper part and the lateral part (21, 22); and which extends so as to have no tab and so as to be in the same alignment with the lateral cover (40) and with the grid (20).
 10. A radiator (10) according to any one of the preceding claims, **characterized in that** the connection members (25, 26) on said intermediate connection piece (20) comprise connection parts (251, 261) which provide the connection of the connection members (25, 26) to the intermediate connection piece (20).
 11. A radiator (10) according to any one of the preceding claims, **characterized in that** said connection member (33) comprises a connection part (331); a placement part (332) which extends at the continuation of said connection part (331) and which is placed to the grabbing housing (253) of the connection member (25); and locking tabs (333a, 333b) which are embodied by the extension of the placement part (332) and which exist on the end of said placement part (332).
 12. A radiator (10) according to any one of the preceding claims, **characterized in that** said connection member (45) comprises a placement part (451) which is embodied at the hole part (43) of the lateral cover (40) and which is placed to the grabbing housing (263) of the connection member (26); and locking tabs (452a, 452b) which are embodied by the widening of said placement part (451).
 13. A radiator according to any one of the preceding claims, **characterized in that** said intermediate connection piece (20) defines a hollow rectangular prism form which comprises an upper part (21), a lateral part (22) and a corner part (23, 24).
 14. A radiator (10) according to any one of the preceding claims, **characterized in that** said grid (30) and lateral covers (40a, 40b) are produced using the roll forming method.
 15. A radiator (10) according to any one of the preceding claims, **characterized in that** the intermediate connection piece (20) is made of plastic material.
 16. A radiator (10) according to any one of the preceding claims, **characterized in that** said intermediate connection piece (20) comprises an upper part (21) with rectangular or curved forms so as to be compliant with the grid (30) opening (34).
 17. A radiator (10) according to any one of the preceding claims, **characterized in that** said grid (30) comprises at least one recess (35) wherein the connection members (33) are positioned and which extends from the opening (34) towards the radiator (10).

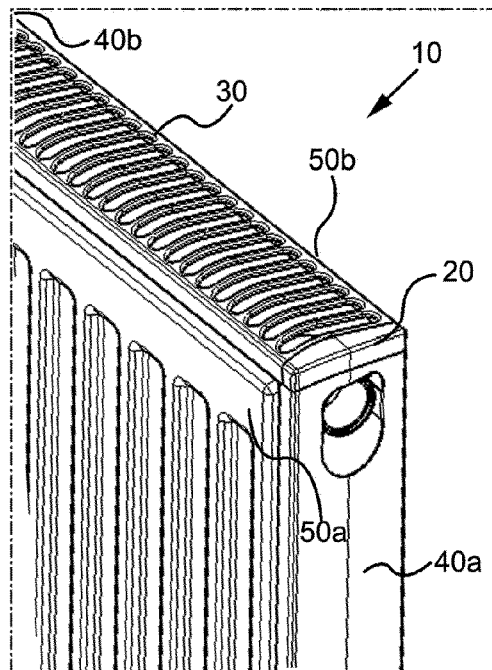


Figure 1

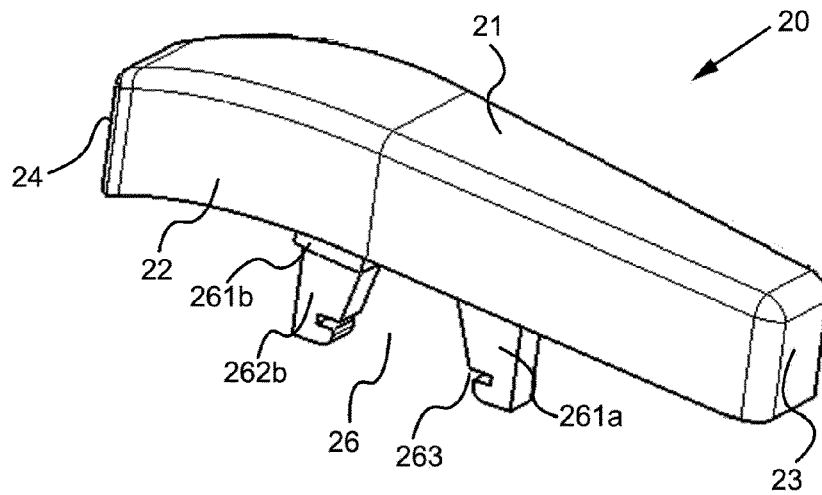


Figure 2a

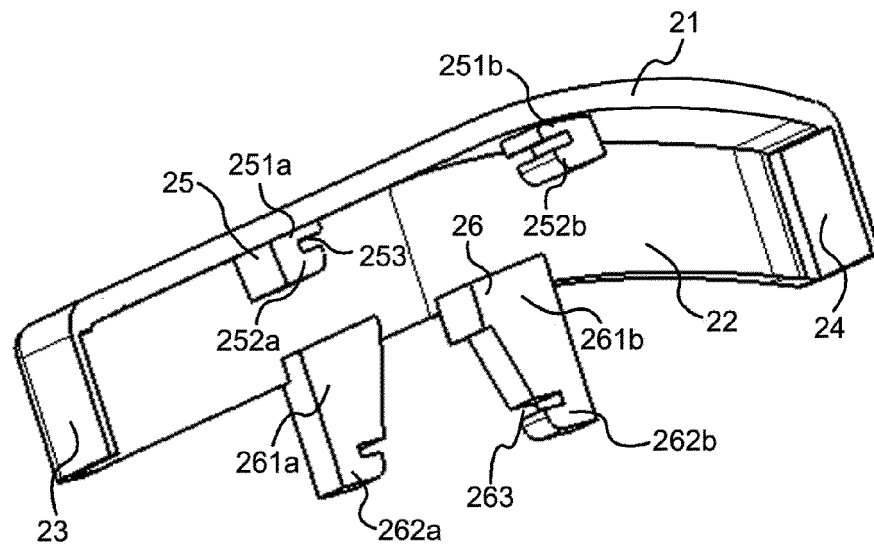


Figure 2b

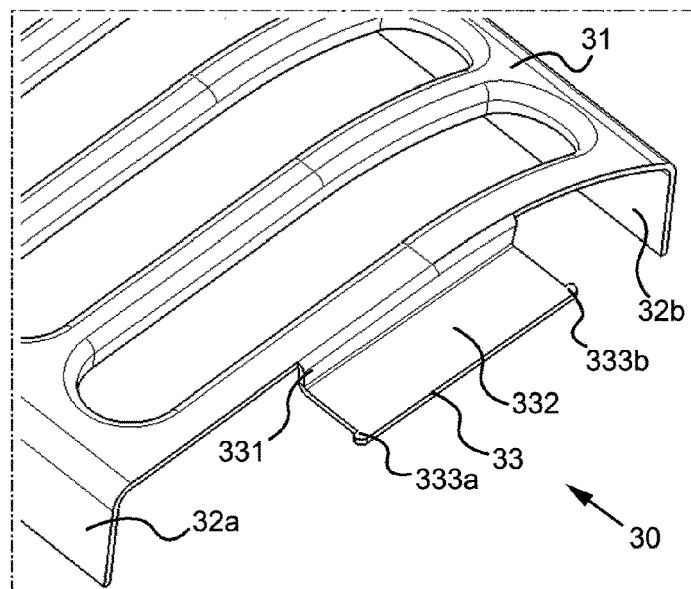


Figure 3

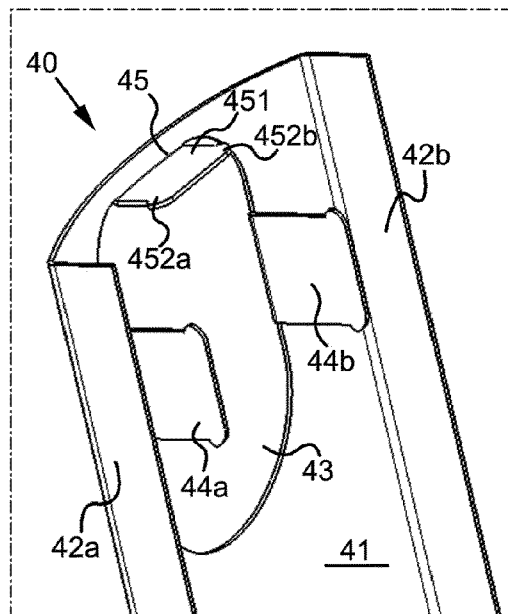


Figure 4

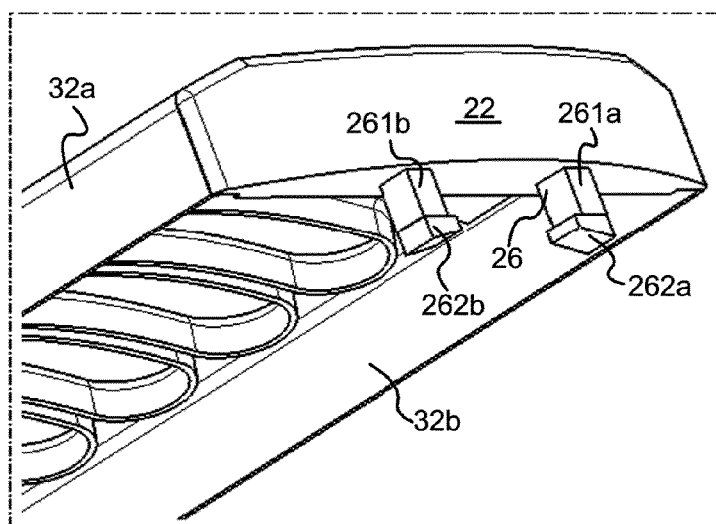


Figure 5

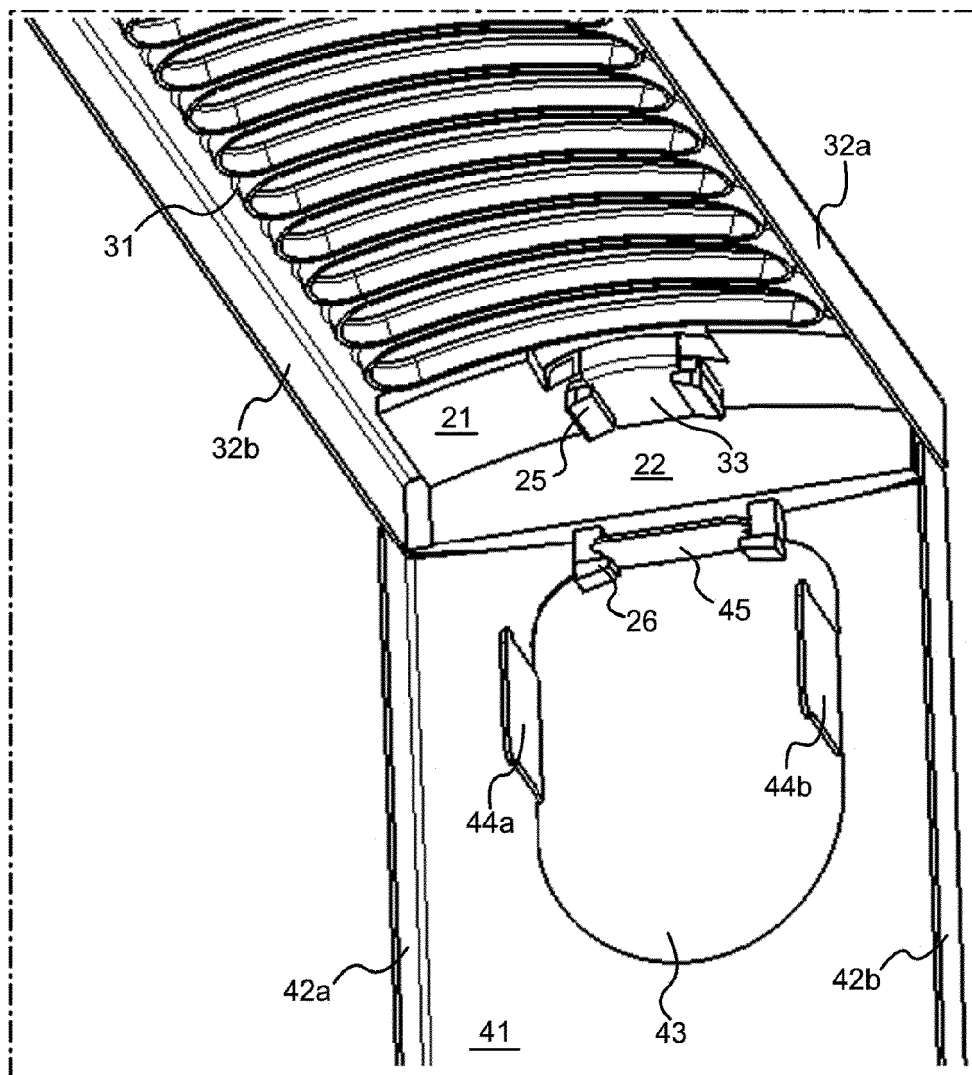


Figure 6

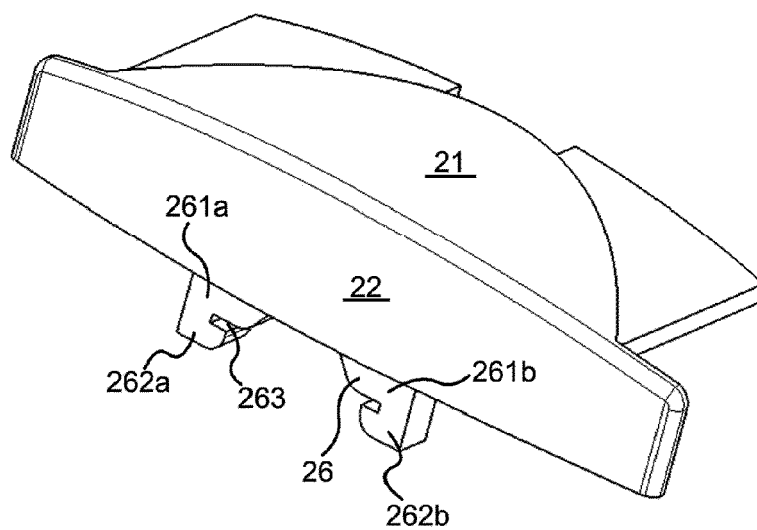


Figure 7a

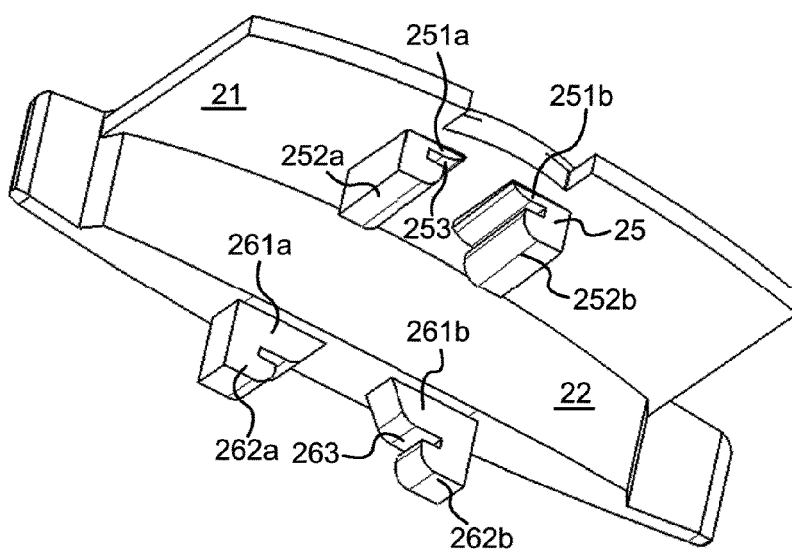


Figure 7b

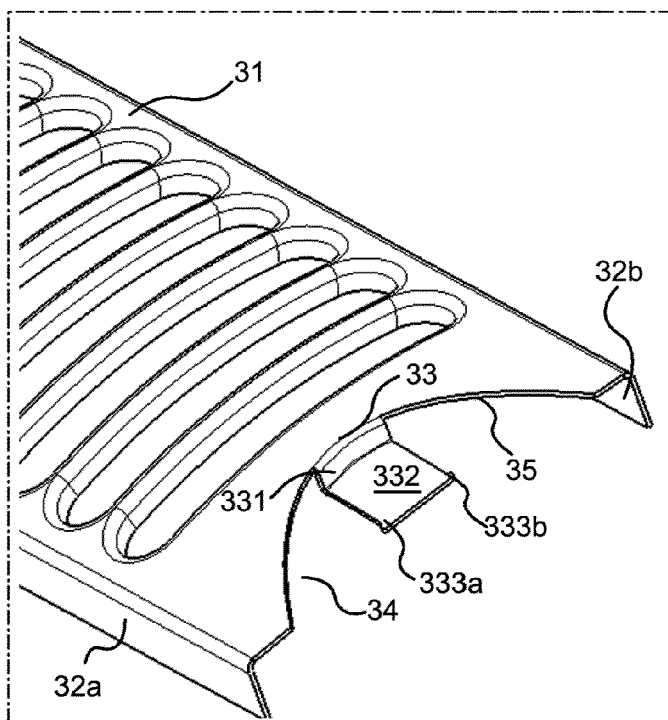


Figure 8

REFERENCES CITED IN THE DESCRIPTION

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