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(54) **NESTABLE PALLET**

(57) A nestable pallet (10) includes a deck (12) having a plurality of openings (16) through an upper support surface thereof. A plurality of corner columns (14) extend downward from the deck. The plurality of corner columns are aligned with the plurality of openings through the upper support surface of the deck. The plurality of corner columns each include a front face (34), a rear face (36), an outer face (38), an inner face (30) opposite the outer face, and an angled face (32) between the inner face and the front face. The angled face includes a plurality of vertical corrugations (28), including a first vertically-elongated recess (28b) between a first vertically-elongated projection (28a) and a second vertically-elongated projection (28c).

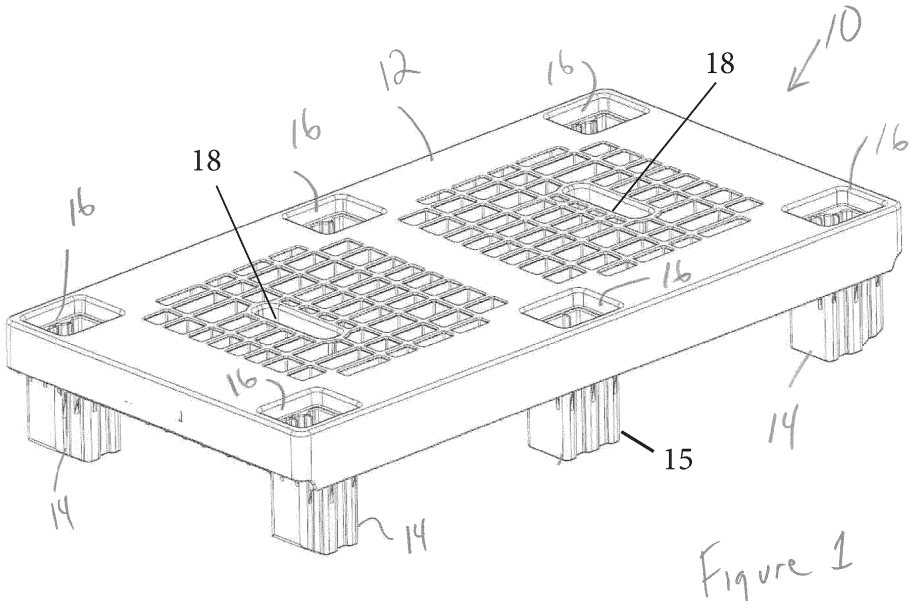

Figure 1

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Description

BACKGROUND

[0001] Nestable half pallets include a deck having a plurality of openings through an upper support surface thereof. A plurality of columns extend downward from the deck. The plurality of columns are aligned with the plurality of openings through the upper support surface of the deck.

[0002] Tines of a pallet jack may be inserted between the columns prior to lifting the nestable pallet. Often, the pallet jack is not perfectly aligned with the tine openings of the nestable pallet. The tines may impact one or more of the columns, which may cause damage to the columns.

SUMMARY

[0003] According to one aspect of the present invention, a nestable pallet includes a deck having a plurality of openings through an upper support surface thereof. A plurality of corner columns extend downward from the deck. The plurality of corner columns are aligned with the plurality of openings through the upper support surface of the deck. The plurality of corner columns each include a front face, a rear face, an outer face, an inner face opposite the outer face, and an angled face between the inner face and the front face. The angled face includes a plurality of vertical corrugations, such as a first vertically-elongated recess between a first vertically-elongated projection and a second vertically-elongated projection.

[0004] The angled faces of the corner columns help align the nestable pallet with misaligned tines during insertion of the tines into an end tine opening of the nestable pallet. This reduces the likelihood of damage to the columns.

[0005] In an embodiment of the above, the corrugations are reinforced with vertical ribs on interior surfaces and angled gussets on exterior surfaces thereof. The angled gussets will also realign the nestable pallet to misaligned tines when the tines are lifted to engage a lower surface of the deck.

[0006] According to another aspect of the present invention, a nestable pallet includes: a deck having a plurality of openings through an upper support surface thereof; a plurality of corner columns extending downward from the deck, the plurality of corner columns aligned with the plurality of openings through the upper support surface of the deck, the plurality of corner columns including a first corner column; and the first corner column including a front face, a rear face, an outer face and an inner face opposite the outer face, the first corner column further including an angled face between the inner face and the front face, the angled face including a first vertically-elongated recess between a first vertically-elongated projection and a second vertically-elongated projection.

[0007] In an embodiment of any of the above, the inner face includes a second vertically-elongated recess between a third vertically-elongated projection and the second vertically-elongated projection.

[0008] In an embodiment of any of the above, the nestable pallet further includes a first vertical interior rib on an inner surface of the first vertically-elongated recess.

[0009] In an embodiment of any of the above, the nestable pallet further includes a second vertical interior rib on an inner surface of the second vertically-elongated projection.

[0010] In an embodiment of any of the above, the nestable pallet further includes a third vertical interior rib on an inner surface of the second vertically-elongated recess.

[0011] In an embodiment of any of the above, the outer face includes a plurality of corrugations.

[0012] In an embodiment of any of the above, the nestable pallet further includes an angled gusset on outer surfaces of each of the first vertically-elongated projection, the second vertically-elongated projection, and the third vertically-elongated projection.

[0013] In an embodiment of any of the above, the nestable pallet further includes an angled gusset on outer surfaces of the first vertically-elongated recess and the second vertically-elongated recess.

[0014] In an embodiment of any of the above, the deck includes a plurality of intersecting ribs and where each of the angled gussets is contiguous with a different one of the plurality of intersecting ribs.

[0015] In an embodiment of any of the above, the deck includes at least one handle opening therethrough.

[0016] In an embodiment of any of the above, the plurality of corner columns further includes second, third, and fourth corner columns and wherein the second, third, and fourth corner columns are mirror images of the first corner column.

[0017] In an embodiment of any of the above, the nestable pallet further includes a pair of side columns extending downward from the deck between the plurality of corner columns.

[0018] In an embodiment of any of the above, the deck is 18-24" by 36-48" (45.7-61.0 cm by 91.4-121.9 cm).

[0019] According to another aspect of the present invention, a nestable half pallet includes: a deck having a plurality of openings through an upper support surface thereof, the deck further including a plurality of intersecting ribs extending downward from an upper support surface of the deck; a pair of side columns extending downward from side edges of the deck; a plurality of corner columns extending downward from the deck, the plurality of corner columns and the pair of side columns aligned with the plurality of openings through the upper support surface of the deck; and each of the plurality of corner columns including a front face, a rear face, an outer face, an inner face opposite the outer face, and an angled face between the inner face and the front face, the angled face

including a plurality of vertical corrugations.

[0020] In an embodiment of any of the above, the inner face includes a plurality of vertical corrugations.

[0021] In an embodiment of any of the above, the angled face includes a first vertically-elongated recess between a first vertically-elongated projection and a second vertically-elongated projection.

[0022] In an embodiment of any of the above, the inner face includes a second vertically-elongated recess between a third vertically-elongated projection and the second vertically-elongated projection.

[0023] In an embodiment of any of the above, the nestable half pallet further includes vertical interior ribs on inner surfaces of the first vertically-elongated recess, the second vertically-elongated projection, and the second vertically-elongated recess.

[0024] In an embodiment of any of the above, the nestable half pallet further includes an angled gusset on outer surfaces of each of the first vertically-elongated projection, the second vertically-elongated projection, the third vertically-elongated projection, the first vertically-elongated recess and the second vertically-elongated recess.

[0025] In an embodiment of any of the above, each of the angled gussets is contiguous with a different one of the plurality of intersecting ribs of the deck.

[0026] According to another aspect of the present invention, a nestable pallet includes: a deck having a plurality of openings through an upper support surface thereof; a plurality of columns extending downward from the deck, the plurality of columns aligned with the plurality of openings through the upper support surface of the deck, the plurality of columns including a first column; and the first column including a front face, a rear face, an outer face and an inner face opposite the outer face, the inner face including a plurality of vertical corrugations reinforced by a plurality of vertical inner ribs along interior surfaces thereof and a plurality of angled gussets along exterior surfaces thereof.

[0027] In an embodiment of any of the above, the outer face includes a plurality of corrugations reinforced by a plurality of vertical ribs along interior surfaces thereof and a plurality of angled outer gussets along exterior surfaces thereof.

[0028] In an embodiment of any of the above, the deck includes a plurality of intersecting ribs and where each of the plurality of angled gussets is contiguous with a different one of the plurality of intersecting ribs.

[0029] In an embodiment of any of the above, the deck includes at least one handle opening therethrough.

[0030] In an embodiment of any of the above, the nestable pallet is a half pallet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031]

Figure 1 is an upper perspective view of a nestable pallet.

Figure 2 is a top view of the nestable pallet of Figure 1.

Figure 3 is a side view of the nestable pallet of Figure 1.

Figure 4 is a bottom view of the nestable pallet of Figure 1.

Figure 5 is an enlarged view of one of the corner columns of the nestable pallet of Figure 4.

Figure 6 is a section view through the corner column of the nestable pallet of Figure 5, looking downward.

Figures 7 and 8 are perspective views of one of the corner columns of the nestable pallet of Figure 1.

Figure 9 is an end view of the nestable pallet of Figure 1.

Figure 10 is a top view of a pair of tines of a pallet jack or pallet lift (not shown) entering a short end of the nestable pallet of Figure 1 at an angle that is approximately 20 to 30 degrees.

Figure 11 is a bottom view of the tines and the nestable pallet of Figure 10.

Figure 12 is a bottom view of the tines and nestable pallet of Figure 11 with the tines more fully inserted below the nestable pallet.

Figure 13 is a top view of the tines and nestable pallet of Figure 12.

Figures 14 and 15 are bottom and top views, respectively, of the tines 50 inserted into the nestable pallet 10 such that the tines 50 are between all four corner columns 14 and between the side columns 15.

Figure 16 is an end view of the tines and nestable pallet of Figure 15 prior to the tines lifting the nestable pallet from the floor.

Figure 17 shows the tines and nestable pallet of Figure 16 with the tines lifted to engage an underside of the deck of the nestable pallet.

Figures 18 and 19 show a forcible side impact of one of the tines on one of the corner columns of the nestable pallet.

DETAILED DESCRIPTION

[0032] A nestable pallet 10 according to an example embodiment is shown in Figure 1. The nestable pallet 10 includes a deck 12 and a plurality of corner columns 14 and side columns 15 supporting the deck 12 above the floor. The nestable pallet 10 may be made of plastic, and for example, integrally molded as a single piece of suitable plastic. In this example, the nestable pallet 10 is a half-pallet, i.e. about half the size of a standard pallet, or in the range of about 18-24" by 36-48" (45.7-61.0 cm by 91.4-121.9 cm). The nestable pallet 10 has two corner columns 14 and one side column 15 along each long edge ("side") of the deck 12. The columns 14, 15 are generally hollow and are aligned with corresponding openings 16 through an upper support surface of the deck 12, which are configured to receive the plurality of columns 14, 15 of an identical nestable pallet 10 therein.

Handle openings 18 may be formed through the deck 12 to facilitate lifting and carrying the nestable pallet 10 by a user.

[0033] Figure 2 is a top view of the nestable pallet 10 of Figure 1. The openings 16 are aligned with and lead to the interiors of the plurality of columns 14, 15.

[0034] Figure 3 is a side view, i.e. a view of one of the long sides of the nestable pallet 10. As shown, the exterior faces of the plurality of columns 14, 15 each have a plurality of corrugations 20 oriented vertically. The corner columns may have tapered leading edges, as shown.

[0035] Figure 4 is a bottom view of the nestable pallet 10. The deck 12 includes a plurality of intersecting ribs 22 below the support surface of the deck 12 and connecting to the plurality of columns 14, 15, as is well known. A peripheral rib 24 extends about the entire periphery of the deck 12.

[0036] Figure 5 is an enlarged view of one of the corner columns 14 of Figure 4. Each of the columns 14, 15 includes a lower wall 26.

[0037] Figure 6 is a section view through the corner column 14 of Figure 5 (looking downward). The other corner columns 14 would be mirror images. Referring to Figure 6, the corner column 14 generally has the shape of a rectangle with a cut corner. The corner column 14 has a front face 34, which would face the nearest short side of the nestable pallet 10, and a rear face 36 on an opposite side of the corner column 14 (facing the adjacent side column 15 along the same long side of the nestable pallet 10 (Figure 4)). The front face 34 and rear face 36 are generally parallel.

[0038] The corner column 14 has an outer face 38 facing the nearest long side of the nestable pallet 10. The corner column 14 also has an inner face 30 opposite the outer face 38 and generally parallel to the outer face 38. The corner column 14 also includes an angled face 32, which cuts the "corner" between the inner face 30 and the front face 34.

[0039] The outer face 38 includes the plurality of corrugations 20. The inner face 30 and angled face 32 each include a plurality of corrugations 28a-e (collectively corrugations 28). Interior ribs 29 may reinforce some or all of the plurality of corrugations 20, 28. The plurality of corrugations 20, 28 each include a plurality of alternating vertically-elongated recesses and vertically-elongated projections.

[0040] More specifically, the angled face 32 includes a first vertically-elongated recess 28b between a first vertically-elongated projection 28a and a second vertically-elongated projection 28c. The inner face 30 includes a second vertically-elongated recess 28d between a third vertically-elongated projection 28e and the second vertically-elongated projection 28c.

[0041] Referring to Figures 4-6, each corner column 14 is configured and orientated such that the angled face 32 is adjacent the nearest short side of the nestable pallet 10 and such that a distance between the leading edges of the angled faces 32 of two adjacent corner columns 14 along a common short side of the nestable pallet 10 is initially greater and then decreases moving inward from the short side until reaching the two opposing, generally parallel inner faces 30 of the two corner columns 14.

[0042] Figures 7 and 8, are perspective views of one of the corner columns 14. Again, the other corner columns 14 would be mirror images. A plurality of angled gussets 40 each extend contiguously from a different one of the plurality of intersecting ribs 22 of the deck 12 to the outer surfaces of the plurality of corrugations 28 of the inner face 30 and the angled face 32. A transition from the plurality of intersecting ribs 22 to the plurality of angled gussets 40 is radiused and concave. Similar ribs are connected to the side columns 15 as well.

[0043] Figure 9 is an end view of the nestable pallet 10, i.e. toward one of the short ends of the nestable pallet 10. The plurality of angled gussets 40 extend vertically at an angle less than 45 degrees relative to the inner surfaces of the corner column 14. The plurality of angled gussets 40 have a radiused transition to the plurality of intersecting ribs 22.

[0044] Figure 10 is a top view of a pair of tines 50 of a pallet jack or pallet lift (not shown) entering a short end ("end") of the nestable pallet 10 at an angle that is approximately 20 to 30 degrees, i.e. 20 to 30 degrees away from where the long axes of the tines 50 would be parallel to the long axis of the nestable pallet 10.

[0045] Figure 11 is a top view of the tines 50 and the nestable pallet 10 of Figure 10. In Figure 11, the lower tine 50 and the lower corner column 14 (i.e. "lower" in Figure 11) are "interior" of the angle of rotation of the tines 50 relative to the long axis of the nestable pallet 10. The interior tine 50 abuts the angled face 32 of the interior corner column 14. The angled face 32 (i.e. the cut-away corner) increases the effective width of entry of the pair of tines 50, so the exterior (or "upper" in Figure 11) tine 50 can be received between the corner columns 14, as shown.

[0046] As the tines 50 continue entry into the nestable pallet 10, the tapered leading edge of the exterior tine 50 rides along the inner face 30 of the exterior corner column 14. As it does, this forces the nestable pallet 10 to rotate. The nestable pallet 10 will slidably rotate on the floor as the tines 50 enter the nestable pallet 10 until the long axis of the nestable pallet 10 is substantially parallel to the long axis of the tines 50, as shown in Figure 12. Once the tines 50 are inserted between the corner columns 14 such that the tapered ends of the tines 50 are past the inner faces 30 of the corner columns 14, and the straight edges of the tines 50 abut the inner faces 30 of the corner columns 14, the long axes of the nestable pallet 10 and the tines 50 will be aligned.

[0047] Figure 13 is a top view of the tines 50 and nestable pallet 10 of Figure 12. Figures 14 and 15 are bottom and top views, respectively, of the tines 50 inserted into the nestable pallet 10 such that the tines 50 are between all four corner columns 14 and between the side columns 15.

[0048] Figures 16 and 17 demonstrate one function of the plurality of angled gussets 40. In Figure 16, the tines 50 are in a lowered position, spaced below the lower surface of the deck 12. In Figure 17, the tines 50 are in a raised position, in contact with the lower surface of the deck 12. In between, if the tines 50 are initially off-center relative to the deck 12, one of the tines 50 will contact the plurality of angled gussets 40 on one side of the nestable pallet 10. The angle of the plurality of angled gussets 40 will cause the nestable pallet 10 (and anything stacked thereon) to shift laterally so that the tines 50 are more centered below the deck 12.

[0049] Preferably, the distance between the uppermost inner edges of the plurality of angled gussets 40 (adjacent the plurality of intersecting ribs 22) is approximately ¼" (0.64cm) greater than the distance between outermost edges of the tines 50. In other words, there would be approximately 1/8" (0.32cm) of space between each outermost edge of the tines 50 and the plurality of angled gussets 40 when the tines 50 are perfectly centered under the deck 12. The relatively snug fit between the tines 50 and the columns 14, 15 help resist the pallet 10 (and any load thereon) tipping. "Approximately" in this sense means + or - 1/10".

[0050] Figures 18 and 19 show a forcible impact between the tines 50 and one of the corner columns 14. The interior ribs 39, the plurality of angled gussets 40, and the plurality of corrugations 20 on both the outer face 38 and the inner face 30 (see, e.g., Figure 6) of the corner columns 14 and side columns 15 reinforce the columns 14, 15 to prevent damage to the columns 14, 15. For example, the disclosed columns 14, 15 resist buckling due to a tine strike.

[0051] In accordance with the provisions of the patent statutes and jurisprudence, exemplary configurations described above are considered to represent a preferred embodiment of the invention. However, it should be noted that the invention can be practiced otherwise than as specifically illustrated and described without departing from its scope. Alphanumeric identifiers on method claim steps are for ease of reference in dependent claims only and do not signify a required sequence of steps unless other explicitly recited in the claims.

Claims

1. A nestable pallet comprising:

a deck having a plurality of openings through an upper support surface thereof; and

a plurality of corner columns extending downward from the deck, the plurality of corner columns aligned with the plurality of openings through the upper support surface of the deck, the plurality of corner columns including a first corner column, the first corner column including a front face, a rear face, an outer face, an inner face opposite the outer face, and an angled face between the inner face and the front face, the angled face including a plurality of vertical corrugations.

2. The nestable pallet of claim 1, wherein the plurality of vertical corrugations of the angled face include a first vertically-elongated recess between a first vertically-elongated projection and a second vertically-elongated projection.

3. The nestable pallet of claim 2, wherein the inner face includes a second vertically-elongated recess between a third vertically-elongated projection and the second vertically-elongated projection.

4. The nestable pallet of claim 3, further including a first vertical interior rib on an inner surface of the first vertically-elongated recess, a second vertical interior rib on an inner surface of the second vertically-elongated projection, and a third vertical interior rib on an inner surface of the second vertically-elongated recess.

5. The nestable pallet of claim 3 or 4, further including an angled gusset on outer surfaces of each of the first vertically-elongated projection, the second vertically-elongated projection, and the third vertically-elongated projection.

6. The nestable pallet of any of claims 3 to 5, further including an angled gusset on outer surfaces of the first vertically-elongated recess and the second vertically-elongated recess.

7. The nestable pallet of claim 5 or 6, wherein the deck includes a plurality of intersecting ribs and each of the plurality of angled gussets is contiguous with a different one of the plurality of intersecting ribs.

8. The nestable pallet according to any preceding claim, wherein the outer face includes a plurality of corrugations.

9. The nestable pallet according to any preceding claim, wherein the deck includes at least one handle opening therethrough.

10. The nestable pallet according to any preceding claim, wherein the plurality of corner columns further includes second, third, and fourth corner columns and the second, third, and fourth corner columns are mirror images of the first corner column.

11. The nestable pallet according to any preceding claim, wherein the nestable pallet is a half pallet.

12. A nestable pallet comprising:

a deck having a plurality of openings through an upper support surface thereof; and
a plurality of columns extending downward from the deck, the plurality of columns aligned with the plurality of openings through the upper support surface of the deck, the plurality of columns including a first column, the first column including a front face, a rear face, an outer face and an inner face opposite the outer face, the inner face including a plurality of vertical corrugations reinforced by a plurality of vertical inner ribs along interior surfaces thereof and by a plurality of angled gussets along exterior surfaces thereof.

13. The nestable pallet of claim 12, wherein the outer face includes a plurality of corrugations reinforced by a plurality of vertical ribs along interior surfaces thereof and by a plurality of angled outer gussets along exterior surfaces thereof.

14. The nestable pallet of claim 12 or claim 13, wherein the deck includes a plurality of intersecting ribs and each of the plurality of angled gussets is contiguous with a different one of the plurality of intersecting ribs.

15. The nestable pallet according to claim 12, 13 or 14, wherein the nestable pallet is a half pallet and optionally the deck includes at least one handle opening therethrough.

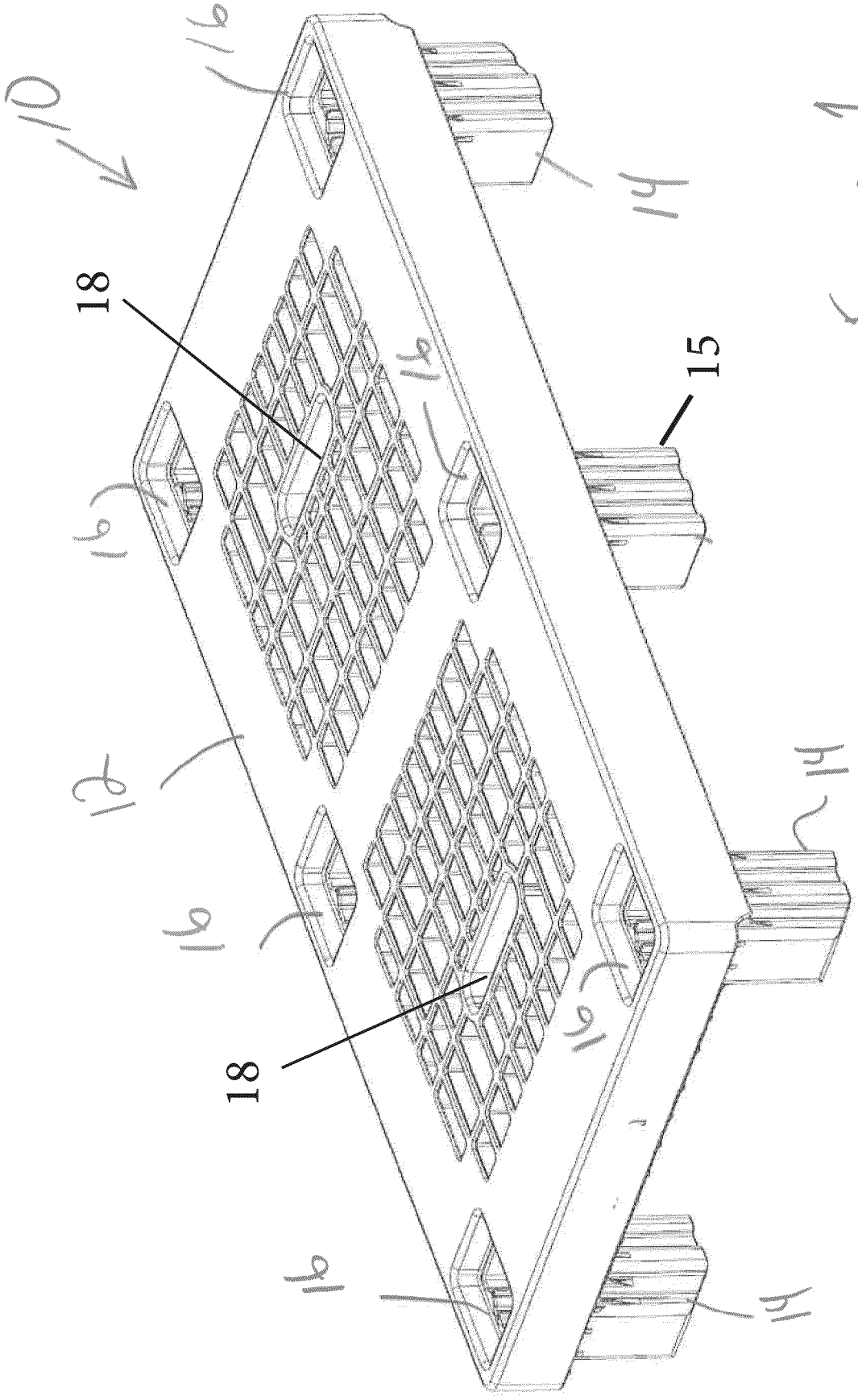

Figure 1

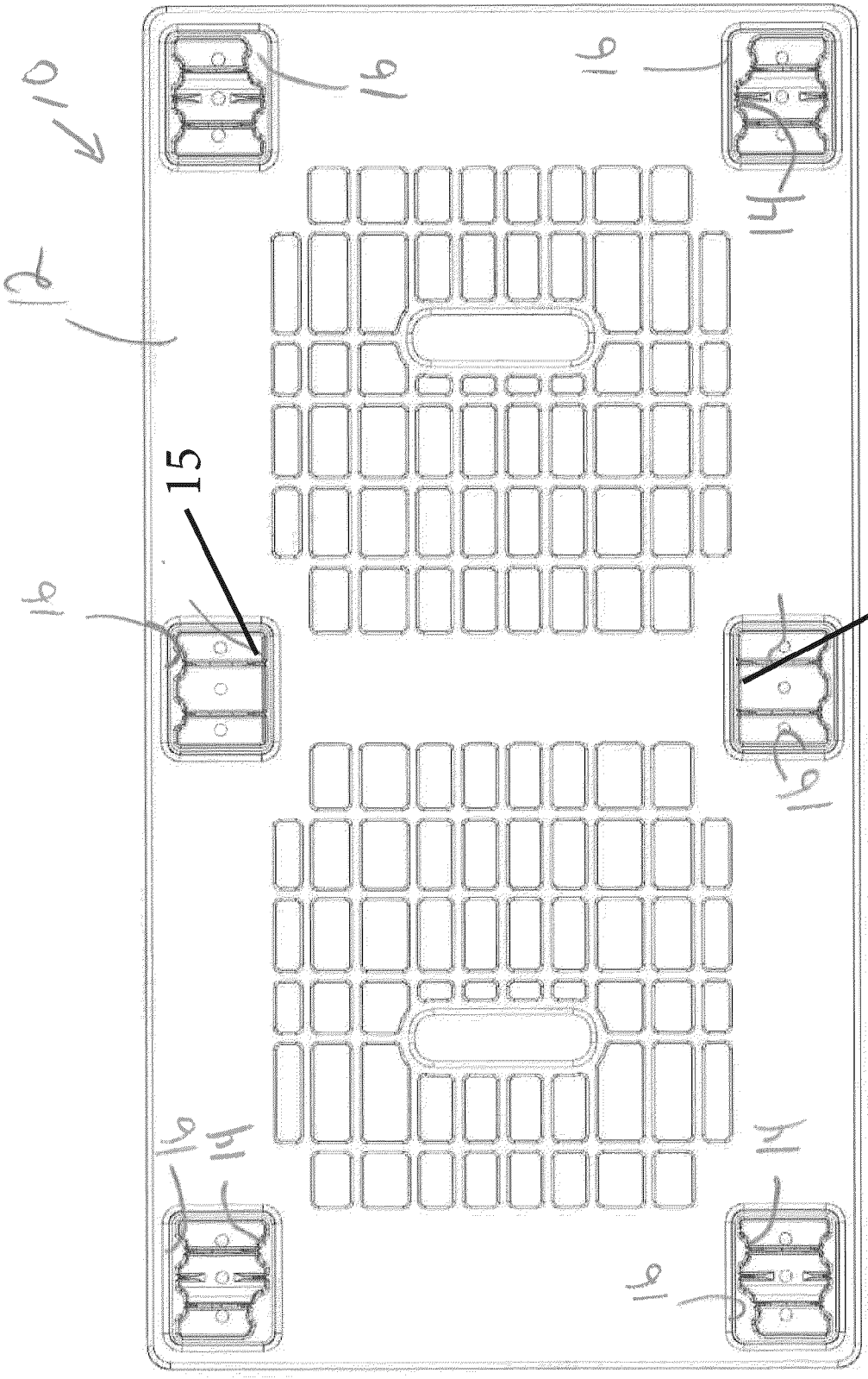

Figure 2

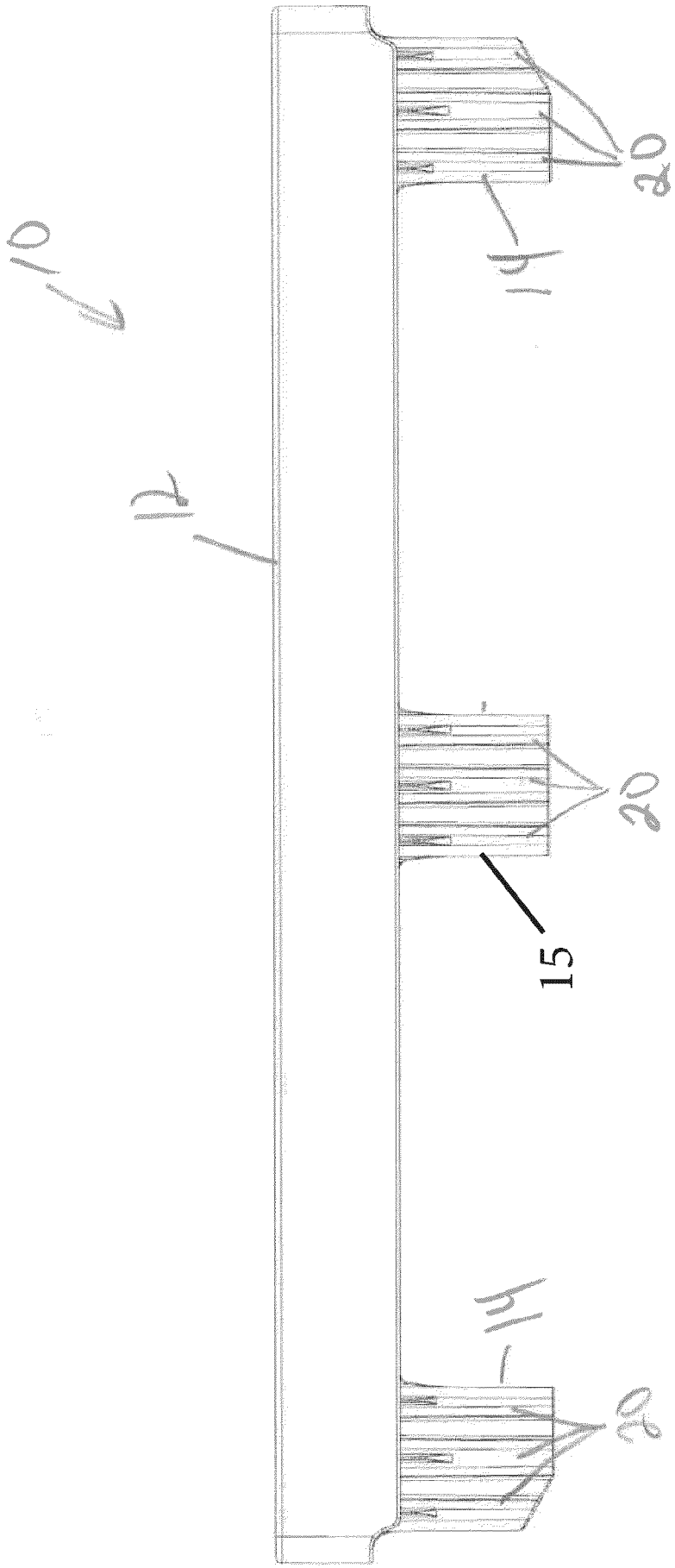

Figure 3

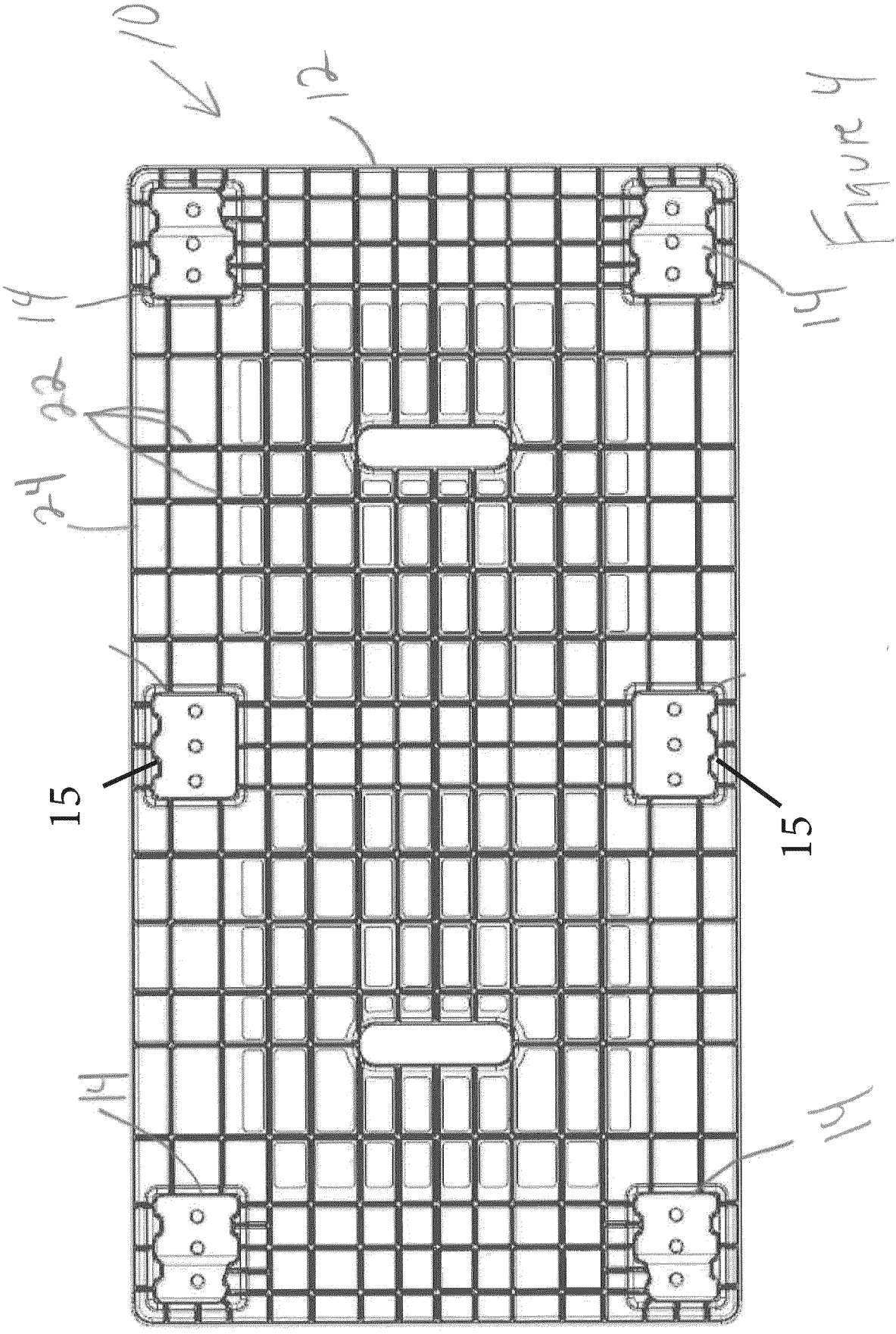

Figure 4

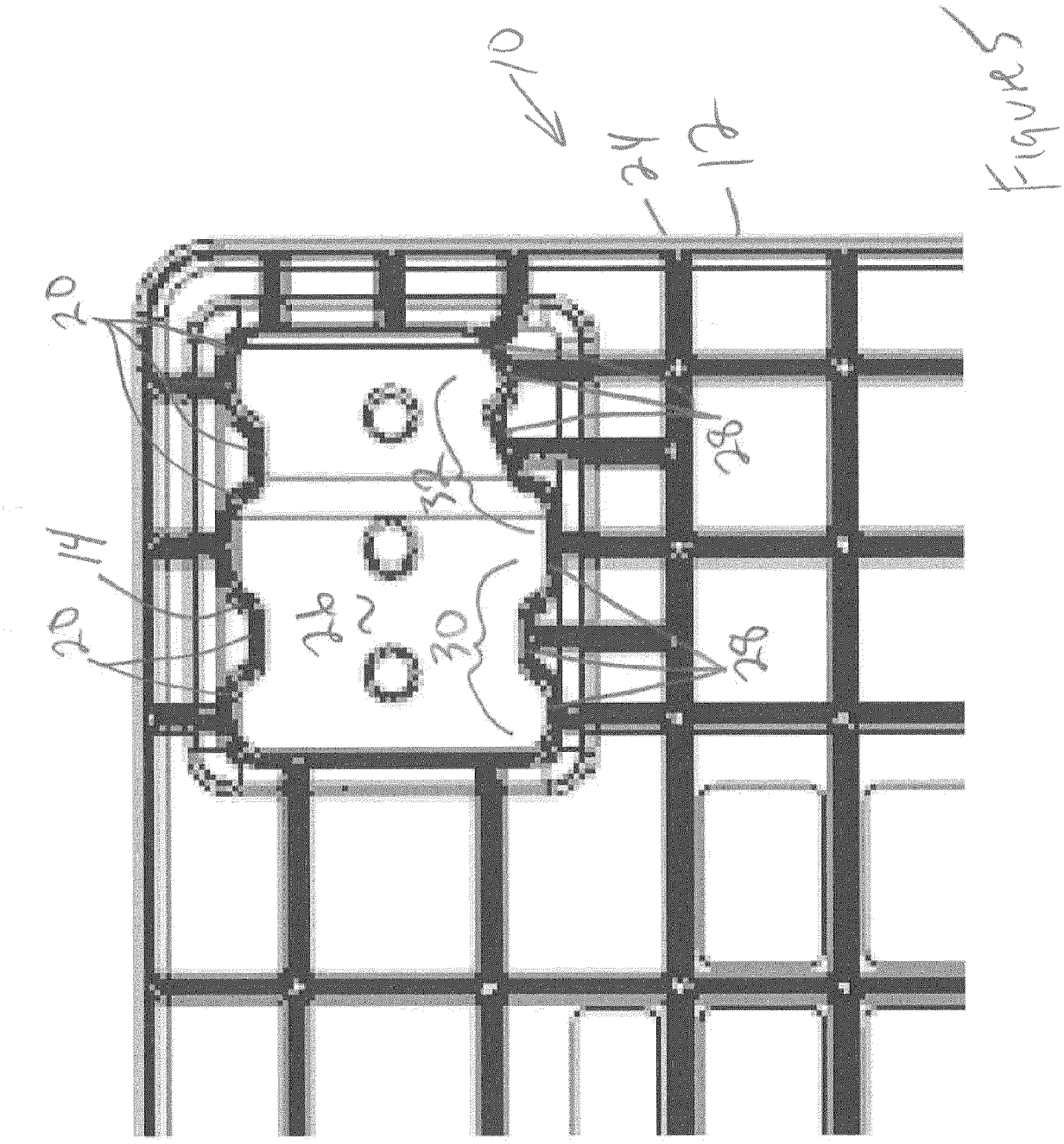
Figure 5
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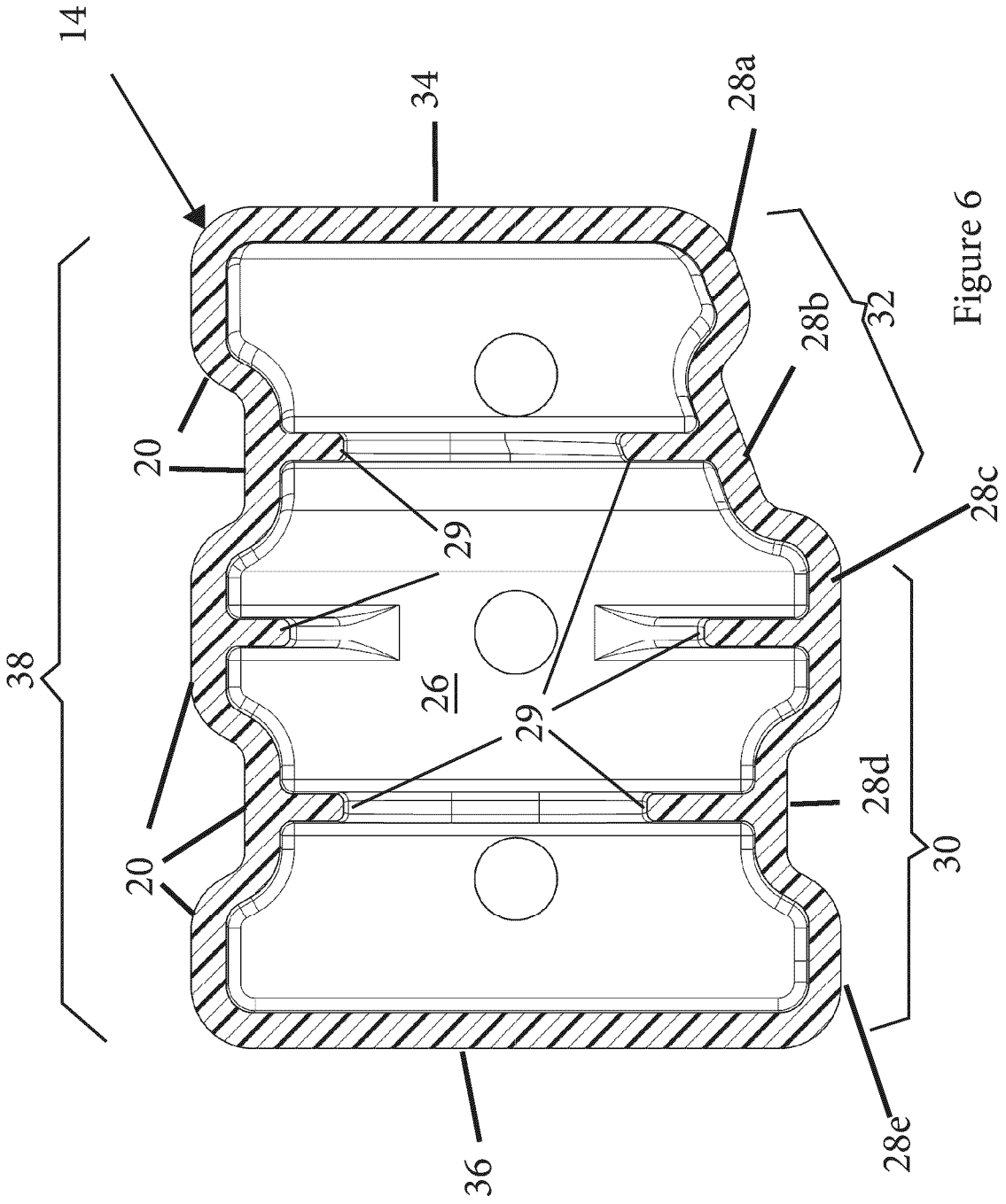

Figure 6

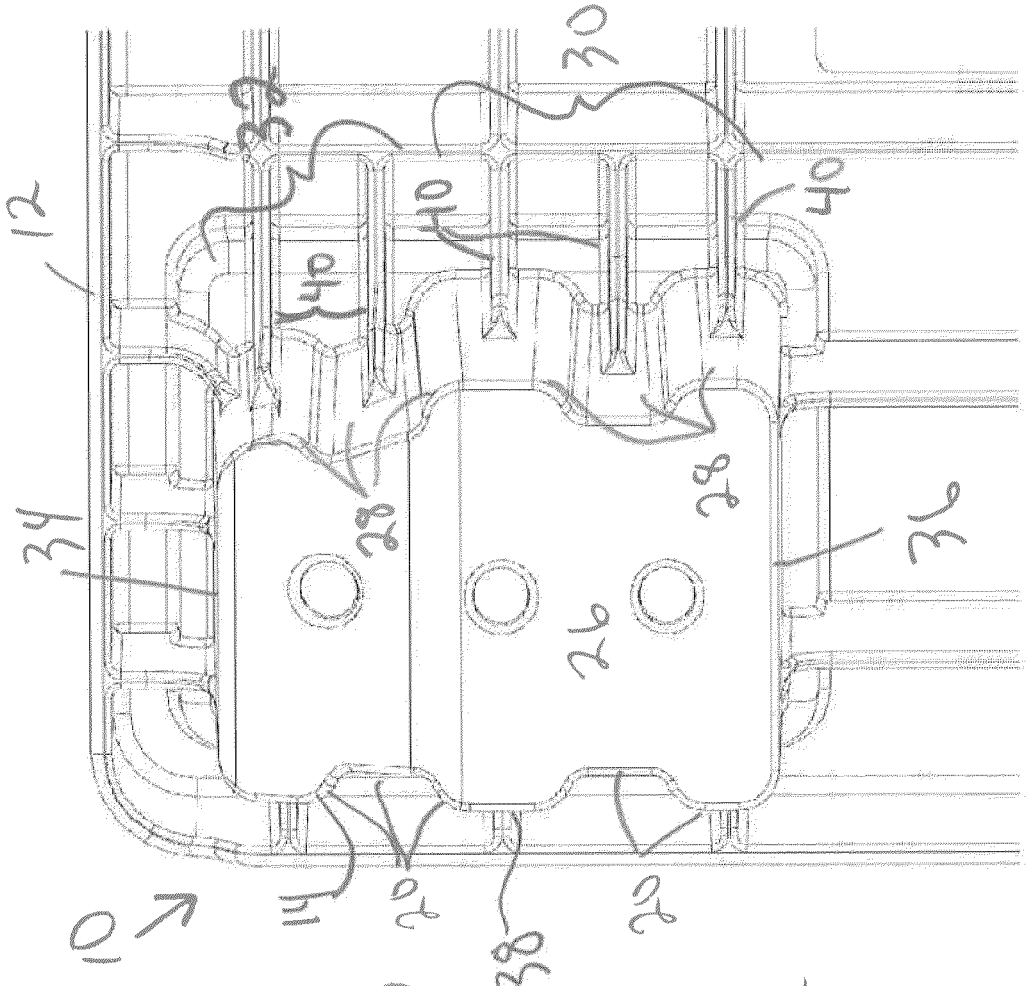

Figure 7

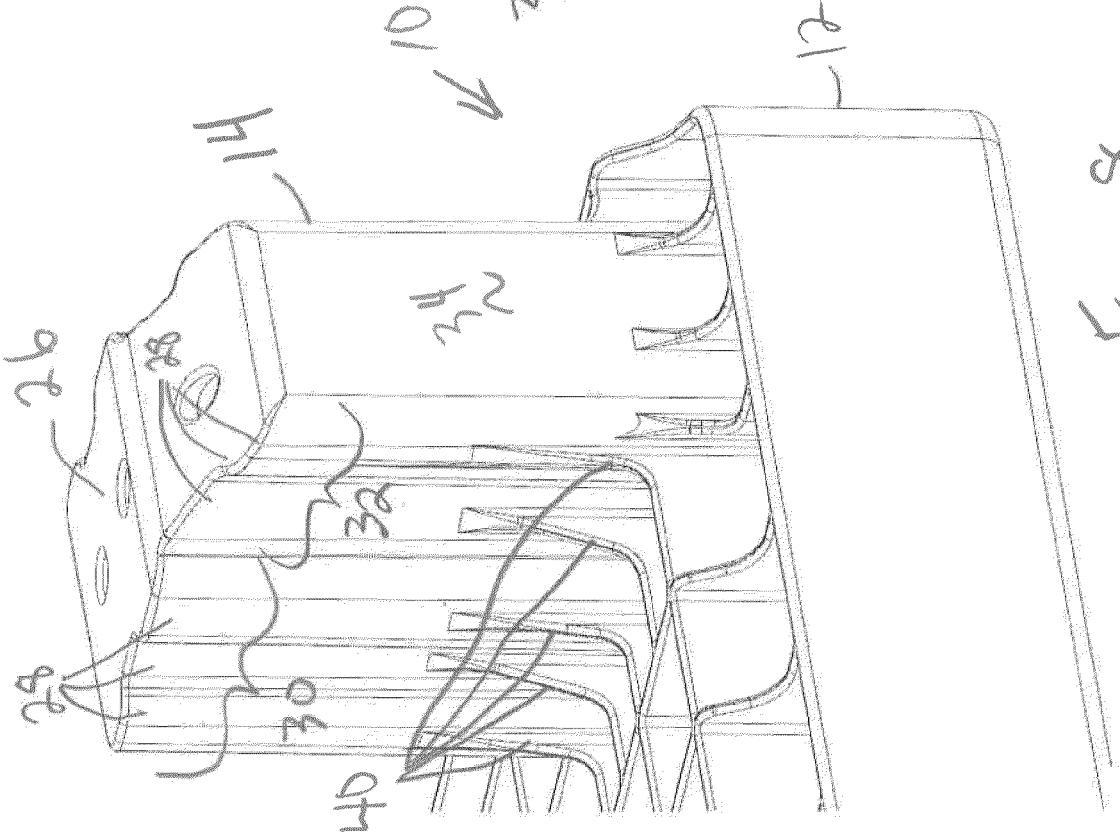

Figure 8

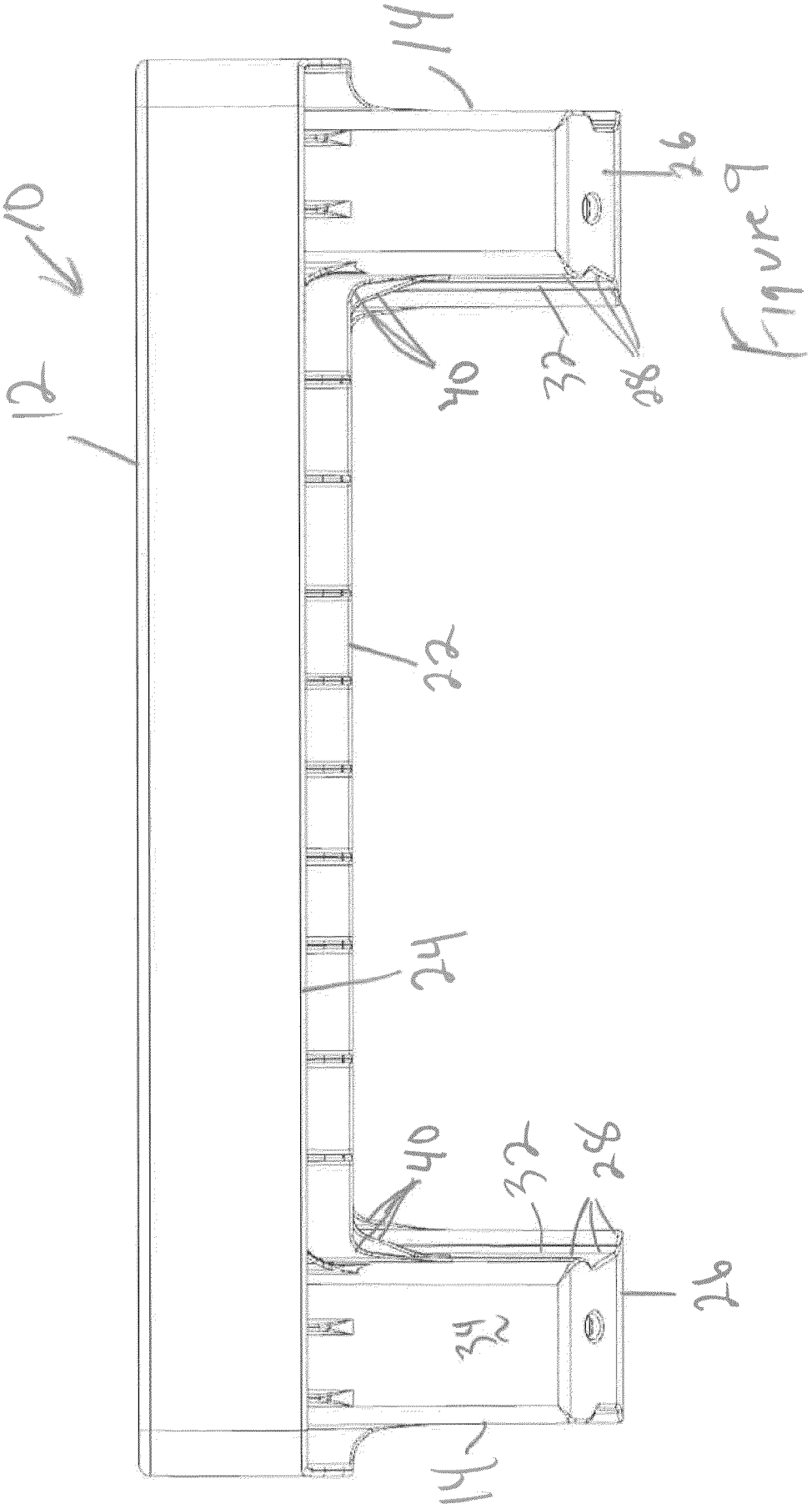

Figure 1

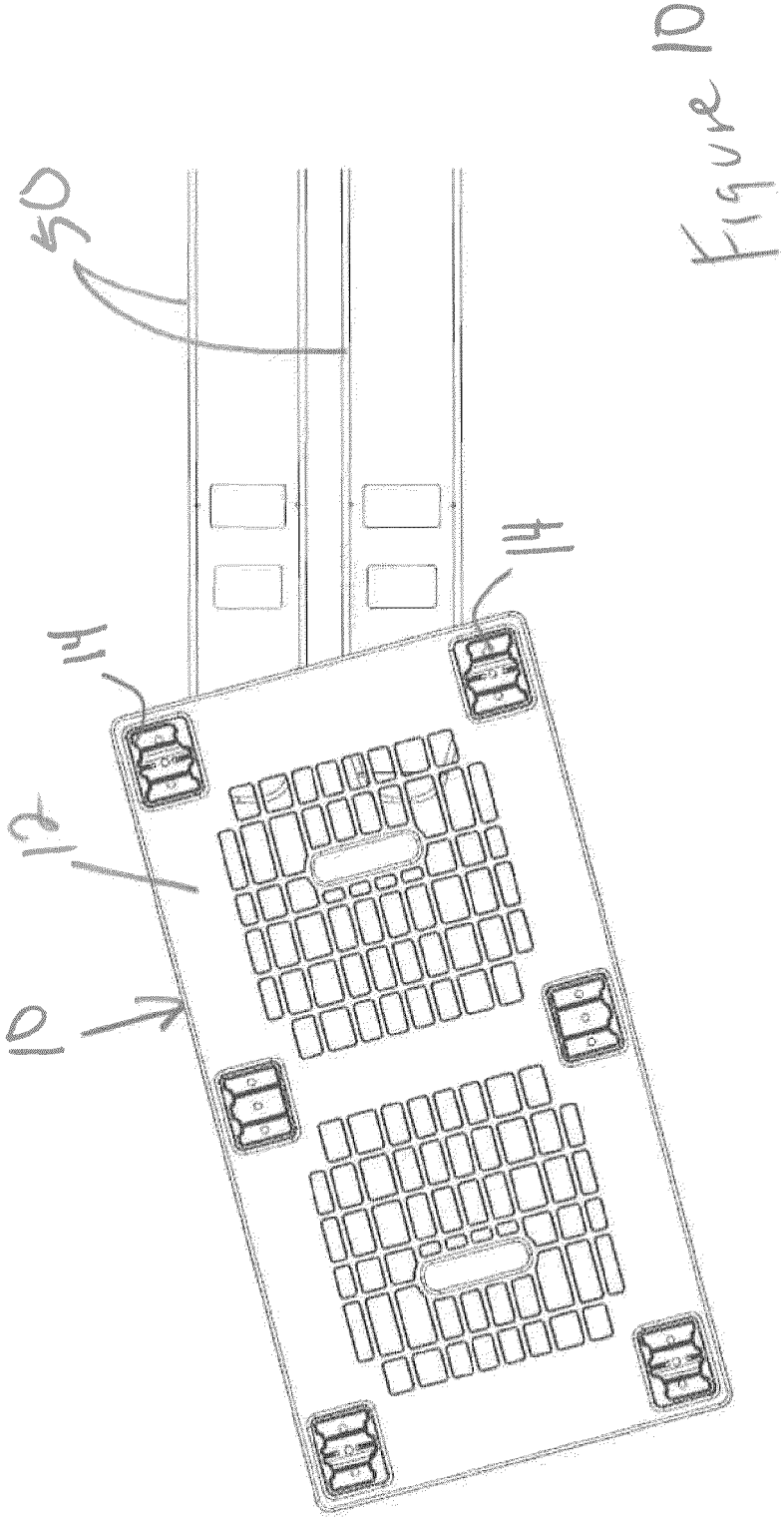

Figure 10

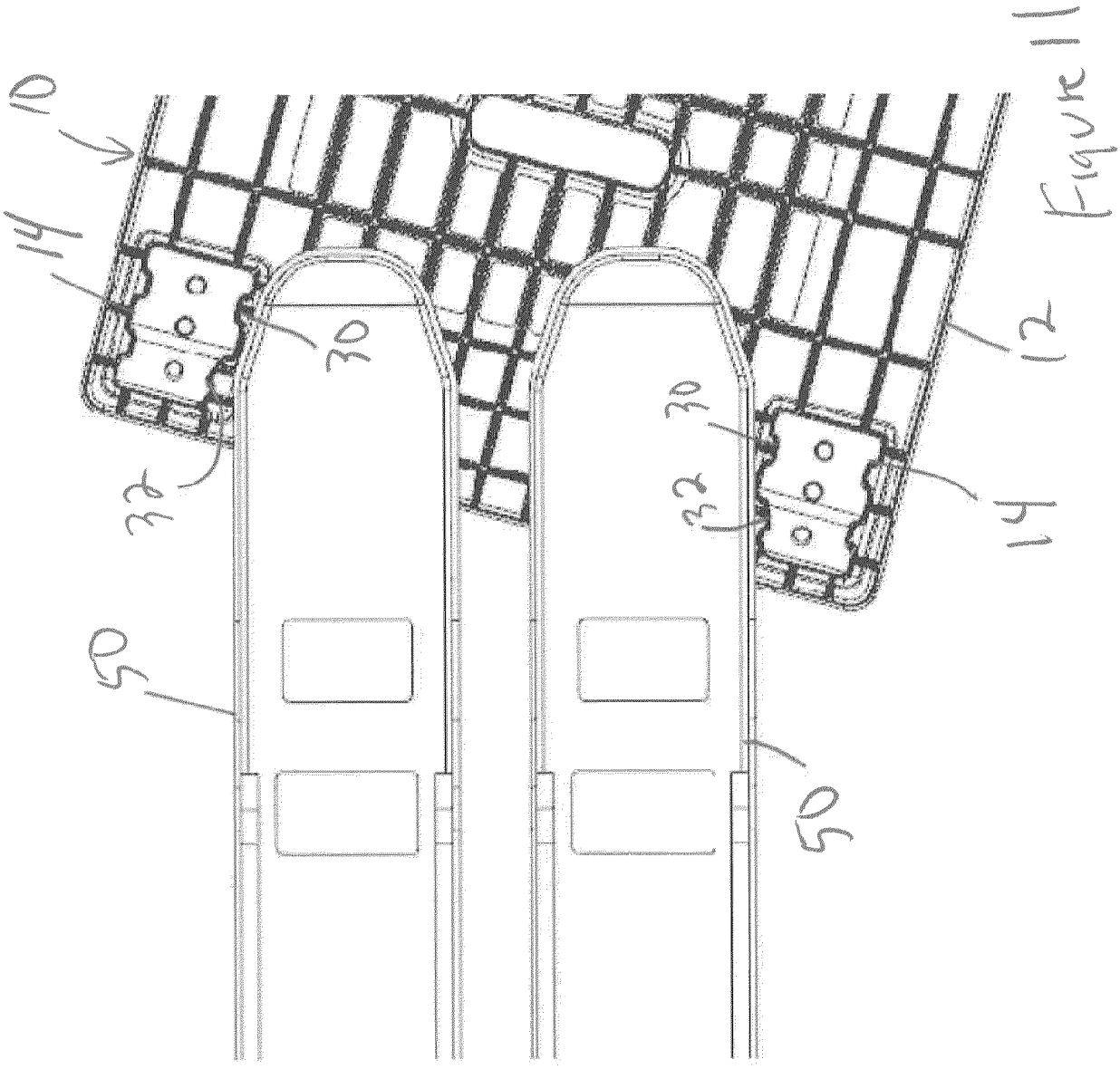

Figure 11

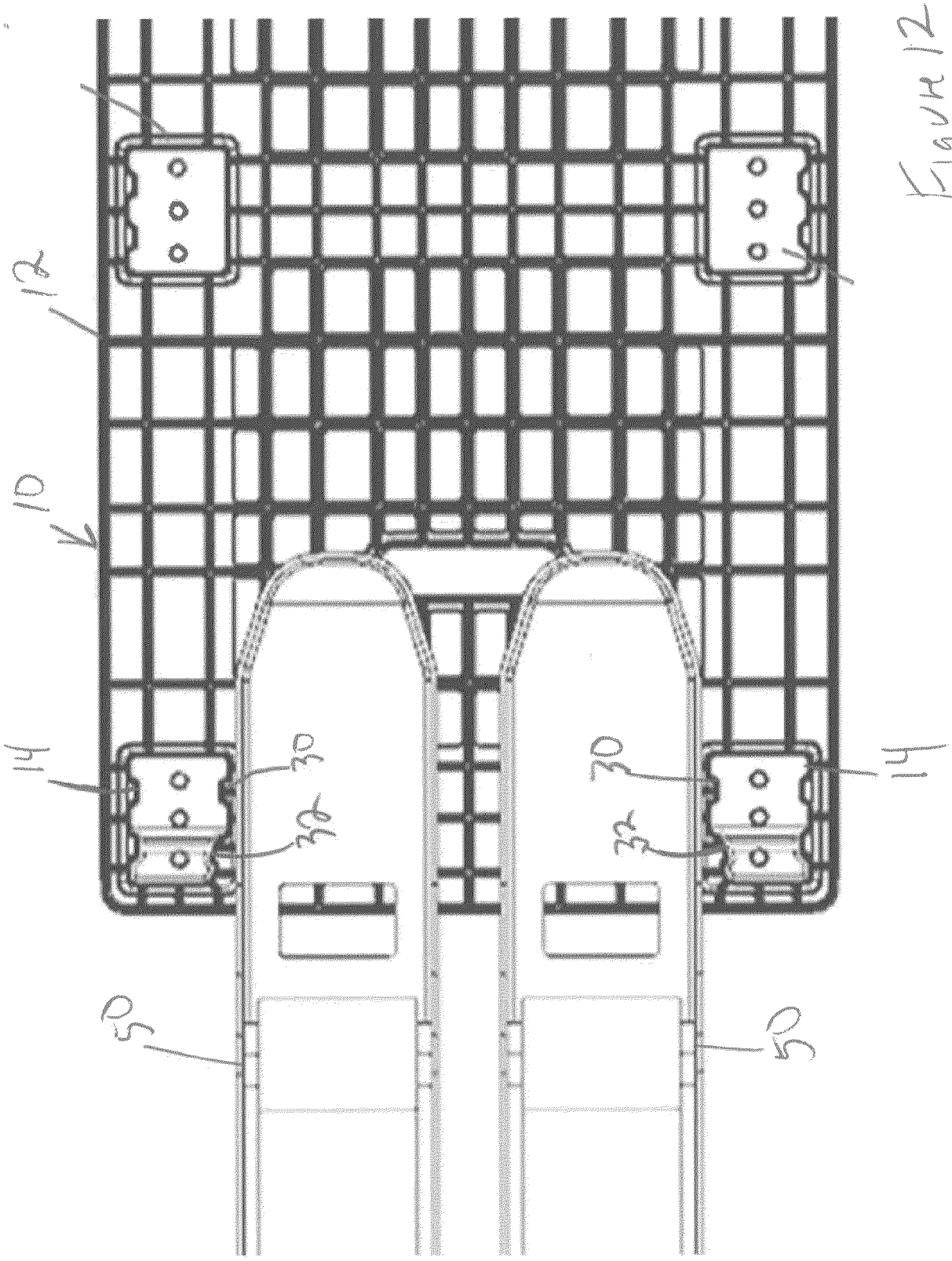

Figure 12

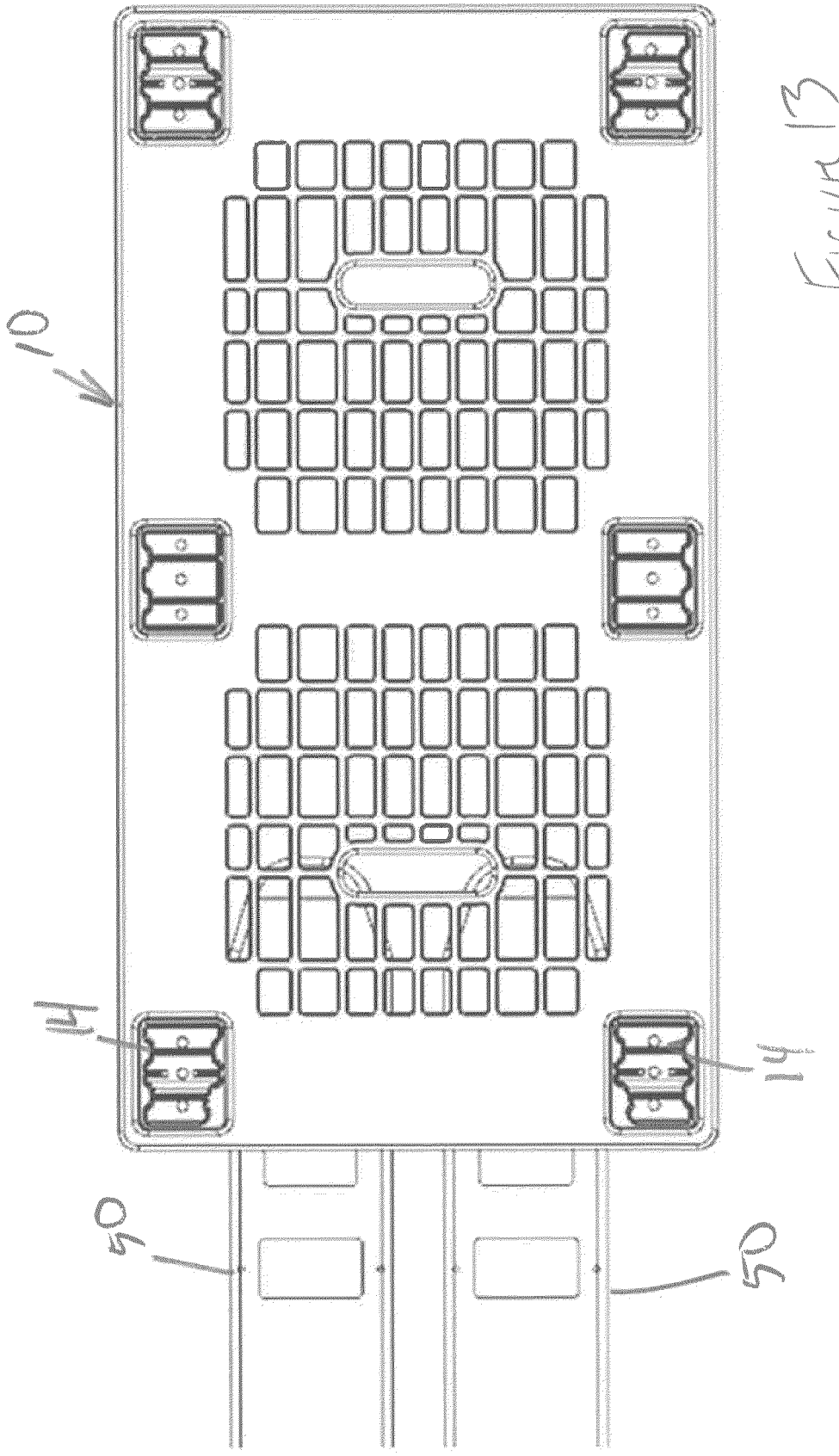

Figure 13

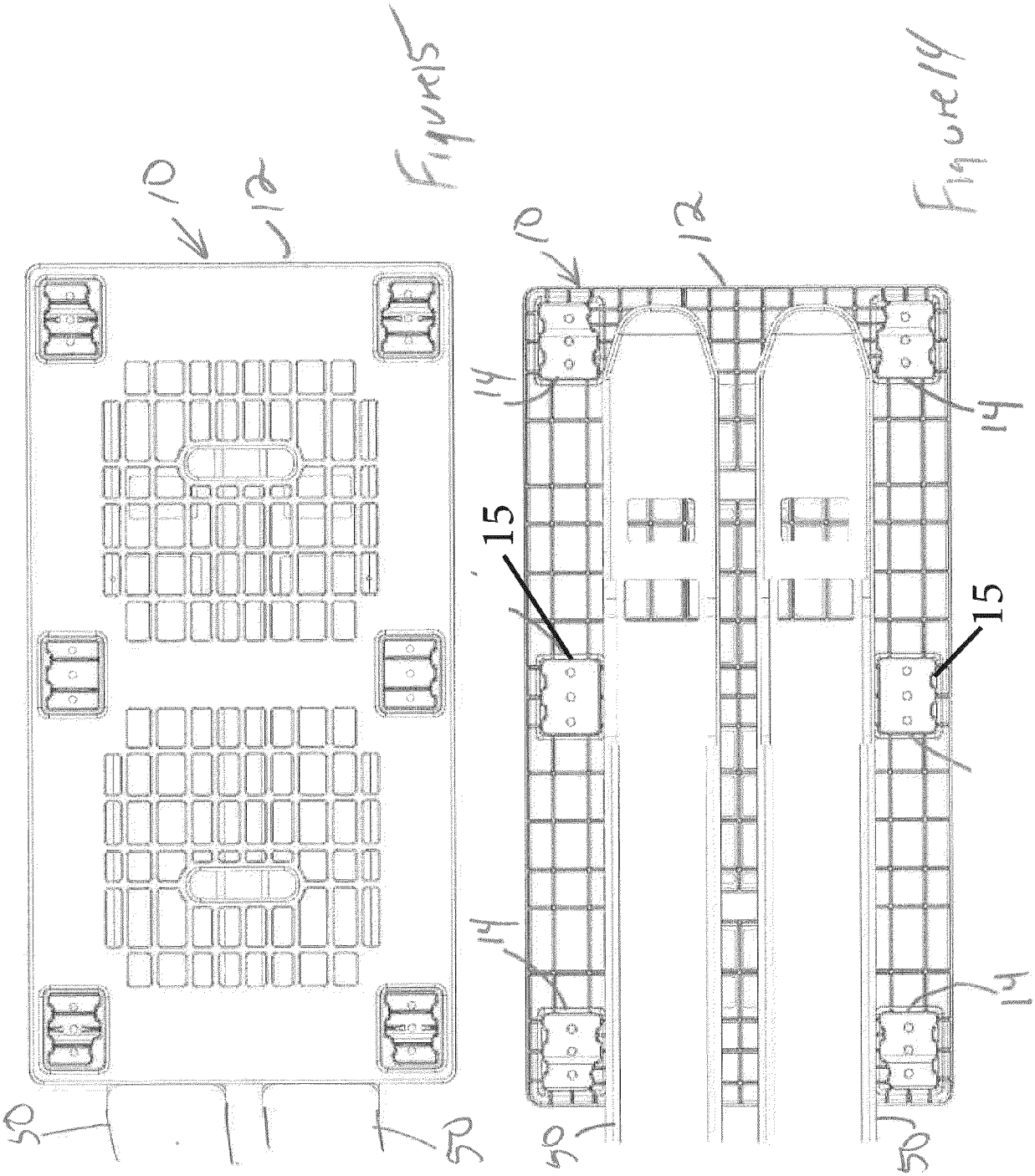

Figure 15

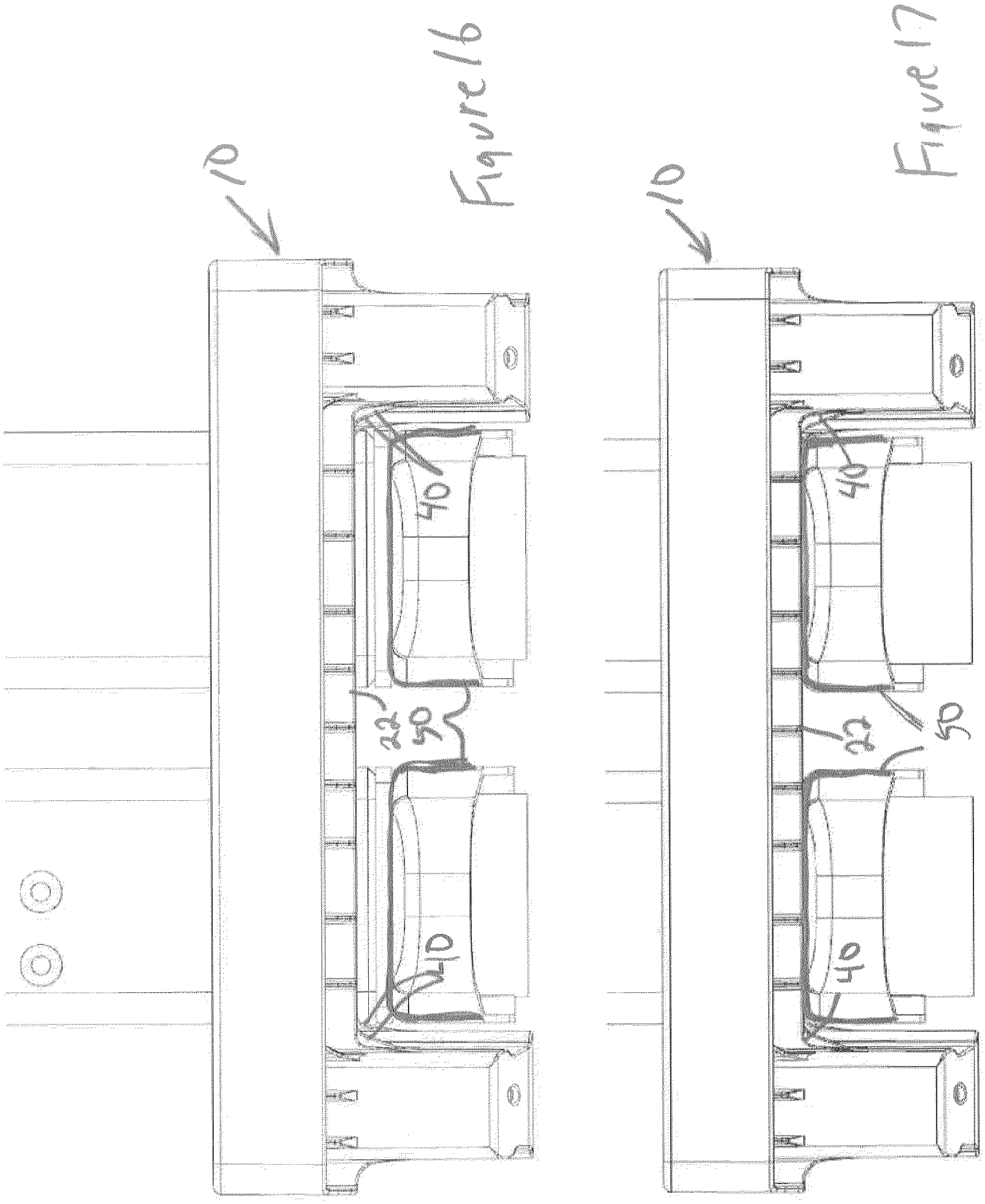
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Figure 16
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Figure 17

Figure 18

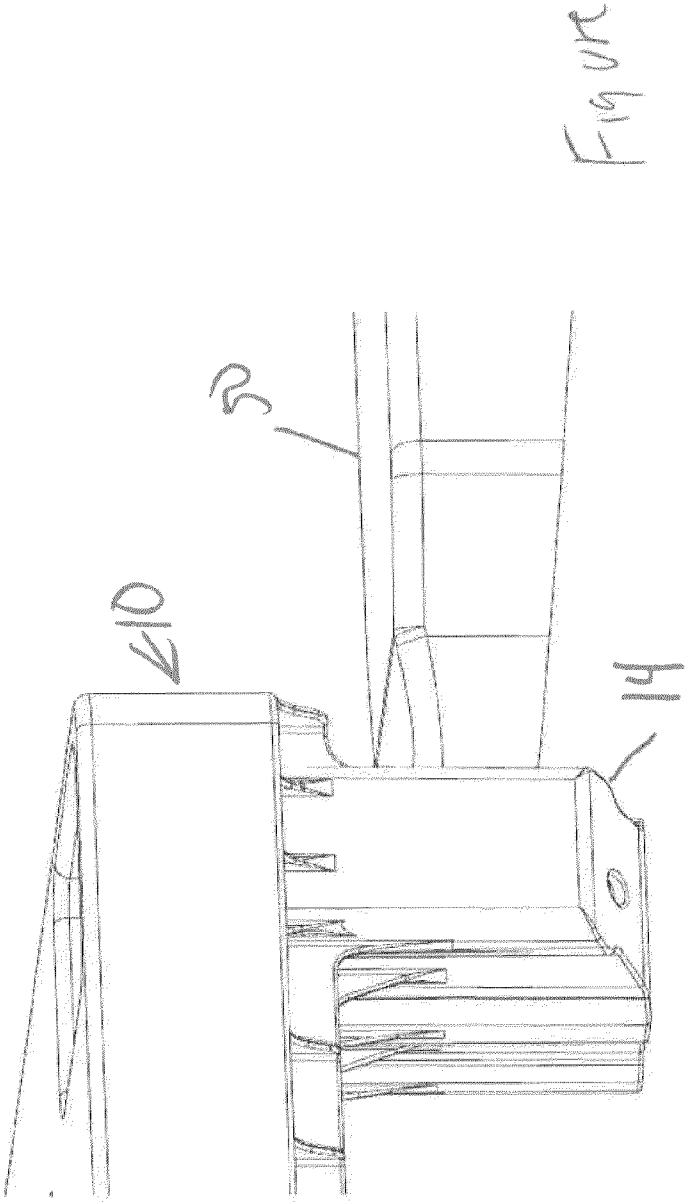
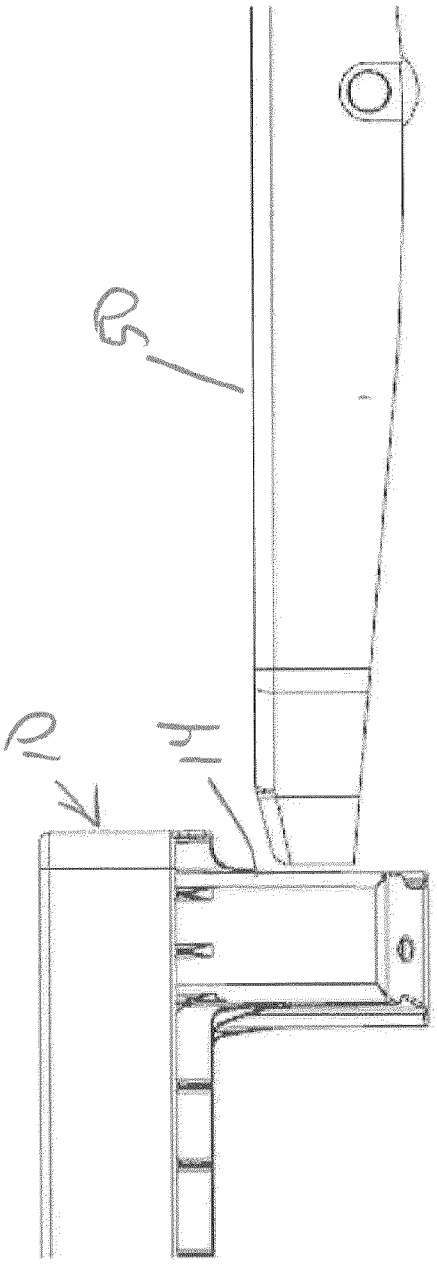


Figure 19



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Application Number
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Place of search	Date of completion of the search	Examiner
Munich	7 February 2025	Fitterer, Johann

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