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(54) GATE AND FRAME

(57) The invention provides a barrier 1 comprising a frame 100 and a mounting means for temporarily attaching the frame 100 to part of a building 300 so that the barrier lies in front of a doorway or similar opening in the building 300. The frame 100 defines an aperture which is closed by at least two main gates 210/220, 230. The main gates 210/220, 230 are openable to allow a person to pass through the aperture, and the main gates 210/220, 230 are removably mountable on the frame 100. The frame 100 is in at least two parts 110, 120, the parts being separably connected together, each part 110, 120 of the frame being of smaller overall dimensions than the frame 100.

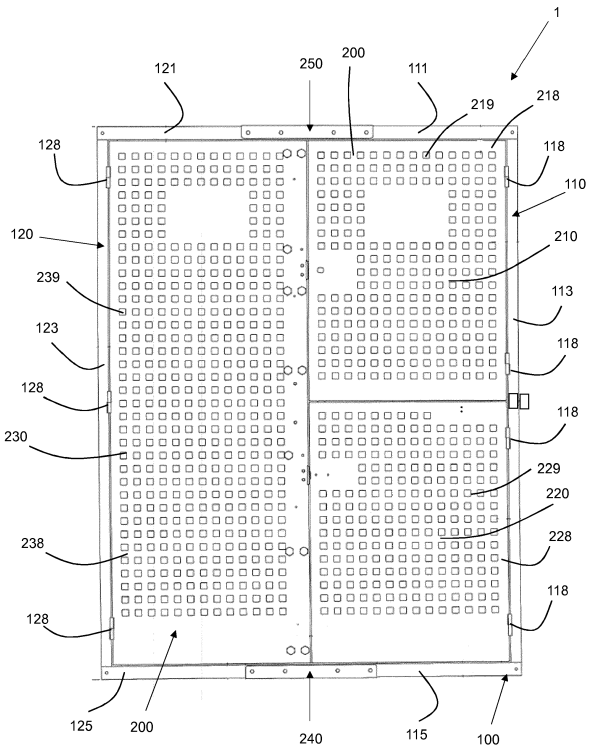

Figure 1

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Description

[0001] The present invention relates to a temporary frame and a gate for an opening, particularly, though not exclusively, for use on a building site.

[0002] Building sites can present various hazards which may threaten the safety of anyone working at the site. One such hazard involves structures that have high open ledges or floors without barriers to prevent anyone working at the ledge or floor from falling. In some cases, harnesses can be used to prevent falling and subsequent injuries or loss of life. However safety harnesses may not always be practical. Another hazard results from exposed wiring along a wall, for example wiring for temporary lights, which could become damaged upon impact.

[0003] In some cases, hazards are concealed and not always obvious to someone working on the building site. One example of this is the openings of a lift shaft while a building is being constructed. In order to avoid this hazard, the openings to the lift shaft may be temporarily covered while work is being done on the floors of the building.

[0004] Another disadvantage is that the cover, once fixed in place, may prevent a worker from accessing the inside of the lift shaft to do work, or if it has a door, the door may not be wide enough to allow the access required to move parts or equipment or for working.

[0005] According to a first aspect the present invention, there is provided a barrier comprising a frame, means for temporarily attaching the frame to part of a building so that the barrier lies in front of a doorway or similar opening in the building, the frame defining an aperture which is closed by at least two main gates, the two main gates being side by side, each of the main gates being openable to allow a person to pass through the aperture, the main gates being removably mountable on the frame, the frame being in at least two parts, the parts being separably connected together, each part of the frame being of smaller overall dimensions than the frame.

[0006] An advantage of the frame being separable into at least two parts is that the frame can be large enough to cover a large opening, for example an opening to a lift shaft, while being provided in parts that are small enough to be transported to the installation site easily. For example, the parts can fit through a doorway and be transported through a building to the installation site. Thus, the frame and other components of a double gate can be carried through a single gate opening/normal doorway.

[0007] The frame may be in two major parts, and each major part may be C-shaped. The ends of the arms of the C-shaped major parts may be connected by at least one connecting part which is attached to both ends, preferably by two connecting parts, one on each side of the ends of the arms of the C-shaped major parts. This enables the ends to be clamped between the connecting parts to be held securely.

[0008] The ends of the arms of the C-shaped major parts may face one another. The ends of the arms of the C-shaped major parts may define opposing side faces. The ends of the arms of the C-shaped major parts may be tubular.

[0009] A connecting part may be arranged on each of the opposing side faces and the connecting parts may be fastened together, for example by bolts, in order to connect the ends of the arms together. Each connecting part may have an L-shaped profile. This arrangement may have the advantage of good structural properties. It will resist movement in more than one direction.

[0010] One of the two main gates may comprise an upper stable gate and a lower stable gate.

[0011] The gates may be configured such that when the lower stable gate and the upper stable gate are in a fully closed position, the lower stable gate cannot be opened without first opening the upper stable gate. Prevention of the lower stable gate from opening without first opening the upper stable gate may be by means of a lip on the lower stable gate. The lower stable gate may comprise a means to enable an operator to open the lower stable gate, the means being provided on the rear of the lower stable gate.

[0012] The other of the two main gates may be a full gate. The main gates may be configured such that when both main gates are in a fully closed position, the full gate cannot be opened without first opening the lower stable gate and the upper stable gate. Prevention of the full gate from opening without first opening the upper stable gate and the lower stable gate may be by means of a lip on the full gate. The barrier may comprise a means to enable an operator to open the full gate, wherein the means to enable an operator to open the full gate is provided on the rear of the full gate.

[0013] The barrier may comprise a backstop, the backstop being arranged to prevent the main gates from rotating past the frame. One of the connecting parts may comprise the back-stop.

[0014] According to another aspect of the invention there is provided a building comprising an opening, wherein a barrier as described above is attached to the building to at least partly cover the opening.

[0015] There may be provided a building comprising a lift shaft opening, wherein a barrier as described above is attached to the building to at least partly cover the lift shaft opening.

[0016] Embodiments of the invention will now be described, by way of example only, with reference to the following figures, in which:

Figure 1 is a front elevation of the gates and frame of a barrier in a first embodiment of the invention;

Figure 2 is a rear elevation of the gates and frame of the embodiment;

Figure 3 is a rear elevation of the upper stable gate of the embodiment;

Figure 4 is a rear elevation of the lower stable gate of the embodiment;

Figure 5 is a rear elevation of the full gate of the embodiment;

Figure 6 is a rear elevation of the frame of the embodiment;
Figure 7a is a rear elevation of the outer part of the lower connecting part of the embodiment;
Figure 7b is a rear elevation of the inner part of the lower connecting part of the embodiment;
Figure 8 is a cross-sectional view through the lower connector of the embodiment;
Figure 9 is cross-sectional view through the lower connector of the embodiment,
attached to the lower arm of the first C-shaped section;
Figure 10 is an underneath plan view of the barrier of the first embodiment;
Figure 11 is a rear perspective view of the barrier of the embodiment;
Figure 12 is a front perspective view of the barrier of the embodiment with the gates fully open;
Figure 13 is a front elevation of the barrier of the embodiment with the gates fully open;
Figure 14 is a front perspective view of the barrier of the embodiment with the gates partially open;
Figure 15 is a schematic representation of the barrier mounted to an opening in a building;
Figure 16 is a schematic representation of a building; and
Figure 17 is a front perspective view of a barrier in a second embodiment of the invention.

[0017] The terms "upper" and "lower" are used throughout the description to refer to relative locations of component parts during use. Equally, the terms "inner" and "outer" are used throughout the description to refer to the relative locations of component parts during use. An "outer part" may be a part that is closer to the front of the arrangement, one that is more likely to be seen during use. These terms should not be construed as limiting the embodiment disclosed, but only as a guide to the skilled person as to how the parts described below can be arranged relative to each other in use.

[0018] Figure 1 is a front view of the barrier 1. The barrier 1 comprises a frame 100 and two main gates 200. The barrier is a double gate.

[0019] The frame 100 comprises a first C-shaped section 110 and a second C-shaped section 120. The first and second C-shaped sections are attachable to each other by means of four connecting parts: a lower and an upper inner connecting part (not shown in figure 1) and a lower and an upper outer connecting part 240, 250.

[0020] The first and second C-shaped sections 110, 120 are substantially the same as each other, so only one C-shaped section will be described in detail. Reference numerals starting "12" refer to the second C-shaped part and reference numerals starting "11" refer to the first C-shaped component. It should be understood that reference numerals starting "11" or "12" ending in the same integer, for example 121 and 111, refer to corresponding components on each C-shaped section. These components may be the same or similar, or linearly symmetrical to each other.

[0021] The C-shaped section has three main parts: an upper arm 121, a side part 123 and a lower arm 125. The arms 121, 125, and the side part 123 are each substantially elongate. The arms 121, 125 are each tubular. The arms 121, 125 each have a square-shaped cross-section. The arms 121, 125 are substantially the same as each other. The arms 121, 125 are each be a single unitary piece of metal. The side part 123 is a single unitary piece of metal. The side part 123 has a longitudinal dimension that is longer than the longitudinal dimension of the arms 121, 125. The side part 123 has an attachment means for attachment to a gate. Each C-shaped section may have a maximum dimension that is less than the maximum dimension of a typical, standard single doorway. This enables easy installation of the gate, as all pieces may be transported through a building site or a building 300 having doorways, whereas the assembled frame would be too large to fit through.

[0022] The upper arm 121 is connected at one end to an end of the side part 123 by a connection means such as a screw and screw-holes in the upper arm 121 and side part 123. The upper arm 121 and the side part 123 are connected to each other at a right-angle. The lower arm 125 is connected at one end to an end of the side part 123 by a connection means such as a screw and screw-holes in the lower arm 125 and side part 123. The lower arm 125 and the side part 123 are connected to each other at a right-angle.

[0023] The first and second C-shaped sections 110, 120 have a different number of attachment means 118, 128 to each other. The first C-shaped section 110 has four attachment means 118. The four attachment means 118 are pins. The second C-shaped section 120 has three attachment means 128. The three attachment means 128 are pins. The three pins 128 are located along the side part 123 of the C-shaped section such that the pins are equally spaced relative to each other.

[0024] The two main gates 200 are arranged side by side. One main gate 200 comprises an upper stable gate 210, and a lower stable gate 220, and the other main gate 200 comprises a full gate 230. Each gate includes a web 218, 228, 238 which is a unitary piece of metal. The webs may each comprise a plurality of perforations 219, 229, 239. The plurality of perforations on each web are arranged in a regular arrangement 219, 229, 239.

[0025] The full gate 230 is substantially rectangular. The full gate 230 is shaped so as to fit between the arms 121, 125 of the second C-shaped section 120. The full gate 230 is shaped so that upon attachment to the second C-shaped section 120, the full gate 230 does not extend beyond the arms 121, 125 of the second C-shaped section 120 into the first C-shaped section 110. The full gate 230 has three attachment means. As best seen in figure 5, the three attachment means are pin receivers 233. The pin receivers 233 are located along the full gate 230 such that when the top of the full gate 230 is aligned with

the upper arm of the first C-shaped section 120, the pin receivers 233 align with the corresponding pins 128 of the second C-shaped section 120. The full gate 230 comprises a lip 235. The lip 235 extends along a full length of the full gate 230. The lip 235 is located on an inner side of the gate 230. The lip 235 is arranged on an opposite edge of the full gate 230 to the pin receivers 233. The lip 235 prevents the full gate 230 from being opened without first opening the upper and lower stable gates 210, 220.

[0026] The upper stable gate 210 and the lower stable gate 220 are substantially the same shape as each other. The upper gate 210 and the lower gate 220 are substantially rectangular. The upper stable gate 210 and the lower stable gate 220 are shaped so that together the upper and lower stable gates both fit between the upper arm 111 and the lower arm 115 of the first C-shaped section 110. The upper gate 210 and the lower gate 220 are shaped so that upon attachment to the first C-shaped section 110, the upper and lower stable gates 210, 220 do not extend beyond the arms 111, 115 of the first C-shaped section 110 into the second C-shaped section 120. The upper stable gate 210 differs from the lower stable gate 220 in that the lower stable gate 220 has a lip 225 as shown in figure 4. The lip 225 is located on an inner side of the gate 220. The lip 225 on the lower stable gate 220 prevents opening of the lower stable gate 220 without first opening the upper stable gate 210.

[0027] The upper stable gate 210 and lower stable gate 220 each comprise two attachment means. The attachment means of each gate are pin receivers 213, 223. The pin receivers 223 of the lower stable gate 220 are located along the stable gate 220 such that when the lower edge of the lower stable gate 220 is aligned with the lower arm of the first C-shaped section 110, the pin receivers 223 align with the corresponding pins 118 of the first C-shaped section 110. The pin receivers 213 of the upper stable gate 210 are located along the upper stable gate 210 such that when the upper edge of the upper stable gate 210 is aligned with the upper arm of the first C-shaped section 110, the pin receivers 213 align with the corresponding pins 118 of the first C-shaped section 110.

[0028] The two C-shaped sections are attached to each other by a lower connecting part 240 and an upper connecting part 250. The upper connecting part 250 connects the upper arms 111, 121 of the first and second C-shaped sections 110, 120. The lower connecting part 240 connects the lower arms 115, 125 of the first and second C-shaped sections.

[0029] The lower connecting part 240 is best seen in figures 1, 2, 7a, 7b, and 8 to 14. The lower connecting part 240 comprises an outer lower connecting part 242 and an inner lower connecting part 247. The outer and inner connecting parts 242, 247 are arranged relative to each other in an arrangement similar to that shown in figure 8. The ends of the lower arms 115, 125 of the two C-shaped pieces are arranged between the lower connecting parts 242, 247. The lower connecting parts 242, 247 are attached to each other through the lower arms 115, 125 by means of a screw 249 through corresponding bores on the connecting parts 242, 247 and the ends of the arms 115, 125, as shown by the schematic representation in figure 9.

[0030] The barrier 1 is configured such that the gates 210, 220, 230 are pivotable away from each other about their respective attachment means. As best seen in figure 2, each gate 210, 220, comprises a latch. The upper stable gate 210 may comprise a slidable latch (not shown). The upper stable gate latch may be located on an outer side of the upper stable gate. The lower stable gate 220 may comprise a lower stable gate latch 227. The lower stable gate latch 227 may be a slidable latch. The lower stable gate latch 227 is located on an inner side of the lower stable gate 220. The full gate 230 may comprise a sprung crossbar latch 237. The sprung crossbar latch 237 extends from an upper edge of the full gate 230 to a lower edge of the full gate 230, such that the latch 237 can simultaneously secure the full gate 230 to the upper arm 121 of the second C-shaped section 120 and to the lower arm 125 of the second C-shaped section 120. The sprung crossbar latch 237 is contained in a cover. The sprung crossbar latch 237 is located on an inner side of the full gate 230.

[0031] Having the latch 227 of the lower stable gate 220 located on an inner side of the gate, and having the latch 237 of the full gate 230 located on an inner side of the gate means that the latches can be hidden when the gates 210, 220, 230 are closed. This, along with the lips 225, 235 being arranged on the inner side of the lower stable gate 220 and the full gate 230 ensures that in order to open all gates 210, 220, 230, the gates must be opened in a specific order. This specific order is: upper stable gate 210, then lower stable gate 220, then full gate 230. Equally, if the full gate 230 is kept closed or locked, a user could only open the upper stable gate 210, or the upper stable gate 210 and then the lower stable gate 220.

[0032] Figure 15 represents the barrier 1 in use, mounted to a wall 301 of a building 300 to cover an opening such as a lift shaft opening. Figure 16 represents a building 300 in which a barrier 1 may be installed.

[0033] All parts described can be easily transported to the required location. All parts described are smaller than a typical, single door opening. The parts may be provided as a kit, transported to site as unassembled pieces and manually assembled at or proximate to the installation location, the installation location being the doorway or similar opening where the barrier will be installed. Equally, some of the parts could be assembled together before being transported to the installation location. Advantageously, the two C-shaped parts 110, 120 of the frame will each be assembled prior to transportation. Each C-shaped part 110, 120 of the frame will be smaller than a typical doorway, so this will not inhibit ease of transportation. However, in most cases it will not be practical to fully assemble all parts together prior to transport to the assembly location, as when assembled together they

would be larger than a typical, single doorway.

[0034] When delivered to the assembly location, for example a lift shaft opening, the parts can be assembled in the following sequence of steps.

[0035] Firstly, a mounting support is fixed around the opening. The mounting support (not shown) is fixed to a wall, floor or ceiling around the opening or proximate the opening.

[0036] One of the C-shaped parts of the frame will be slid into one side of the mounting frame, such that it is overlapped by the mounting frame at an upper edge and a lower edge. The other of the C-shaped parts of the frame is then slid into another side of the mounting frame, such that it is overlapped by the mounting frame at an upper edge and a lower edge. In this arrangement, the two C-shaped parts 110, 120 face each other and define an aperture.

[0037] The lower and upper connecting parts 240, 250 are then mounted onto the two C-shaped parts.

[0038] The outer lower connecting part 242 and the inner lower connecting part 247 are arranged on an outer and inner side of the lower arms 115, 125 of the two C-shaped parts 110, 120. The outer lower connecting part 242 and inner lower connecting part 247 are then fixed to each other by means of a plurality of screws which connect each lower connecting part to each other through the lower arms of the two C-shaped parts 115, 125. This provides a clamping force on the lower arms of the two C-shaped parts 115, 125. There may be two screws through each lower arm as shown in figure 6.

[0039] The outer upper connecting part 252 and the inner upper connecting part 257 are arranged on an outer and inner side of the upper arms of the two C-shaped parts 111, 121. The outer upper connecting part 252 and inner upper connecting part 257 are then fixed to each other by means of a plurality of screws which connect the upper connecting parts to each other through the upper arms of the two C-shaped parts 111, 121. The screws may be held in place by captive nuts on one of the upper connecting parts. Preferable there will be captive nuts on the upper inner connecting part 257. This provides a clamping force on the upper arms of the two C-shaped parts 111, 121. There may be two screws through each upper arm as shown in figure 6.

[0040] The full gate 230 may be hung on the second C-shaped part 120 by aligning the pin receivers of the full gate 230 with the pins 128 of the second C-shaped part and lowering the full gate 230 until it is hung on the pins 128 of the second C-shaped part. The full gate 230 is then swung into position about the pins 128 until it is aligned with the aperture of the frame. The latch 237 of the full gate 230 may then be slid into a locked position to secure the full gate 230 in a closed position.

[0041] The lower stable gate 220 may then be hung on the first C-shaped part 110 by aligning the pin receivers of the lower stable gate 223 with the lower pins 118 of the first C-shaped part 110 and lowering the gate until it is hung on the lower pins of the first C-shaped part 118. The lower stable gate 220 is then swung into position about the pins 118 until it is aligned with the aperture of the frame, in particular until the lower stable gate abuts the lip 235 of the full gate 230. The latch 227 of the lower stable gate 220 may then be slid into a locked position to secure the lower stable gate 220 in a closed position.

[0042] The upper stable gate 210 may then be hung on the first C-shaped part 110 by aligning the pin receivers of the upper stable gate 213 with the upper pins of the first C-shaped part 118 and lowering the gate until it is hung on the upper pins 118 of the first C-shaped part 110. The upper stable gate 210 is then swung into position about the pins 118 until it is aligned with the aperture of the frame, in particular until the upper stable gate abuts the lip 235 of the full gate 230 and the lip 225 of the lower stable gate 220. The latch of the upper stable gate may then be slid into a locked position to secure the upper stable gate 210 in a closed position.

[0043] In use, this arrangement will wholly or substantially cover an opening, for example a lift shaft opening. In use, only the latch of the upper stable gate 210 may be accessible when the gates are in a closed position. As a result of the lip 225 of the lower stable gate 220 and the lip 235 of the full gate 230, the full gate 230 cannot be opened until both of the stable gates have been opened, and the lower stable gate 220 cannot be opened until the upper stable gate 210 has been opened. This order of opening is reinforced by the latch locations. In practice, this means that a user can open the upper stable gate 210 and access the space behind the barrier (eg the lift shaft) safely, with the lower stable gate 220 and full gate 230 being securely closed. When a larger opening is required, for example if a situation requires that equipment is transported through the aperture, then both stable gates 210, 220 can be opened, or all gates 210, 220, 230 can be opened.

[0044] Disassembly of the barrier occurs by a reversal of the assembly steps outlined above. The pieces can then be easily transported away from the site and reused in another location.

[0045] It should be understood that various different variations of the embodiment described above are possible.

[0046] For example, the gates may be solid instead of each comprising a plurality of perforations. This embodiment is shown in Fig 17. This provides greater security, and means that whatever is behind the barrier cannot be seen through it. Alternatively, one or two of the gates may comprise a plurality of perforations and the remaining gate or gates may be substantially devoid of perforations.

[0047] It will be appreciated that although a lift shaft opening has been provided as a typical example of where the barrier can be installed, it has numerous possible applications and should not be limited to this application. Applications should at least include use for any parts of a building site to which access should be restricted. For example, the barrier could be used to cover wiring for temporary lighting, or a part of a building 300 having eas-

ily damageable components or a doorway to a room.

Claims

1. A barrier comprising a frame, means for temporarily attaching the frame to part of a building so that the barrier lies in front of a doorway or similar opening in the building, the frame defining an aperture which is closed by at least two main gates, the two main gates being side by side, each of the main gates being openable to allow a person to pass through the aperture, the main gates being removably mountable on the frame, the frame being in at least two parts, the parts being separably connected together, each part of the frame being of smaller overall dimensions than the frame.

2. A barrier as claimed in claim 1, wherein the frame is in two major parts, and each major part is C-shaped.

3. A barrier as claimed in claim 2, wherein the ends of the arms of the C-shaped major parts are connected by at least one connecting part which is attached to both ends.

4. A barrier as claimed in claim 3, wherein the ends of the arms of the C-shaped major parts face one another.

5. A barrier as claimed in claim 4, wherein the ends of the arms of the C-shaped major parts define opposing side faces, for example wherein the ends of the arms of the C-shaped major parts are tubular.

6. A barrier as claimed in claim 5, wherein a connecting part is arranged on each of the opposing side faces and the connecting parts are fastened together in order to connect the ends of the arms together, for example wherein each connecting part is an L-shaped profile.

7. A barrier as claimed in any preceding claim, wherein one of the two main gates comprises an upper stable gate and a lower stable gate.

8. A barrier as claimed in claim 7, wherein the stable gates are configured such that when the lower stable gate and the upper stable gate are in a fully closed position, the lower stable gate cannot be opened without first opening the upper stable gate for example wherein the prevention of the lower stable gate from opening without first opening the upper stable gate is by means of a lip on the lower stable gate.

9. A barrier as claimed in claim 7 or claim 8, wherein the lower stable gate comprises a means to enable an operator to open the lower stable gate, the means being provided on the rear of the lower stable gate.

10. A barrier as claimed in any of claims 7 to 9, wherein the other of the two main gates is a full gate.

11. A barrier as claimed in claim 10, wherein the main gates are configured such that when both main gates are in a fully closed position, the full gate cannot be opened without first opening the lower stable gate and the upper stable gate, for example wherein the prevention of the full gate from opening without first opening the upper stable gate and the lower stable gate is by means of a lip on the full gate.

12. A barrier as claimed in any of claims 10 to 11, comprising a means to enable an operator to open the full gate, wherein the means to enable an operator to open the full gate is provided on the rear of the full gate.

13. A barrier as claimed in any preceding claim, further comprising a backstop, the backstop being arranged to prevent the main gates from rotating past the frame.

14. A barrier as claimed in claim 13 when dependent on claim 6 or a claim dependent thereon, wherein one of the connecting parts comprises the back-stop.

15. A building comprising an opening, wherein a barrier as described in any preceding claim is attached to the building to at least partly cover the opening.

16. A building comprising a lift shaft opening, wherein a barrier as described in any preceding claim is attached to the building to at least partly cover the lift shaft opening.

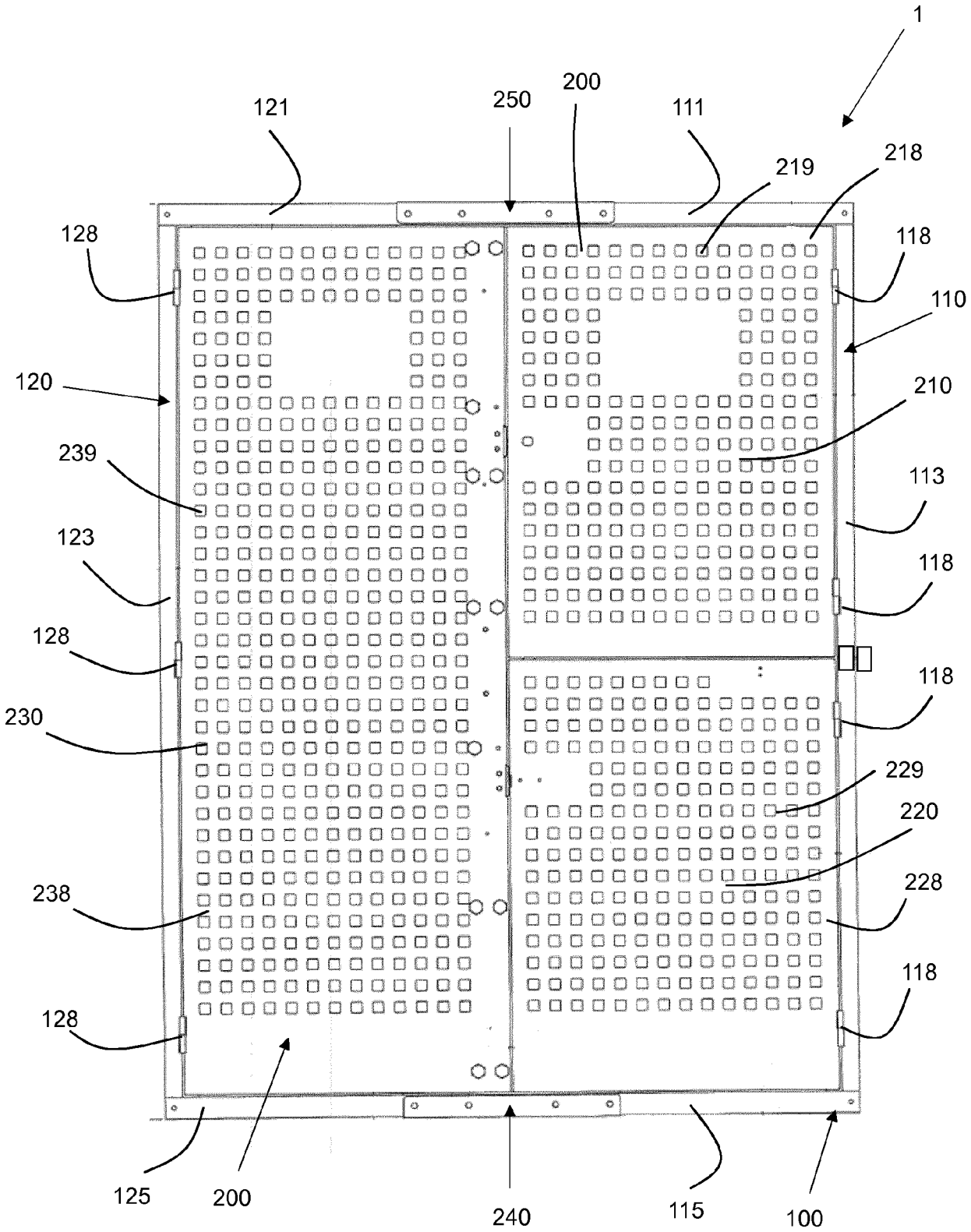
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Figure 1

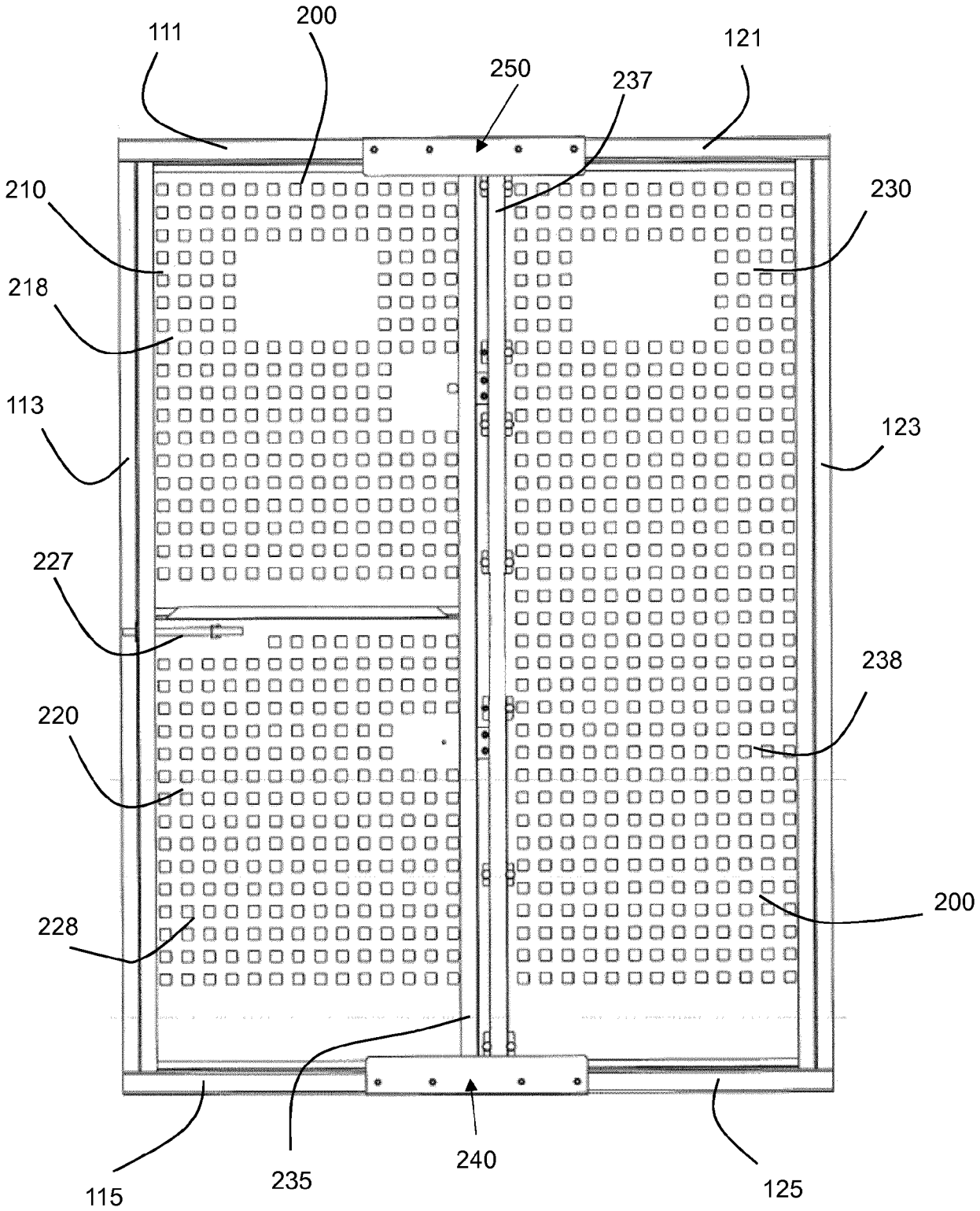
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Figure 2

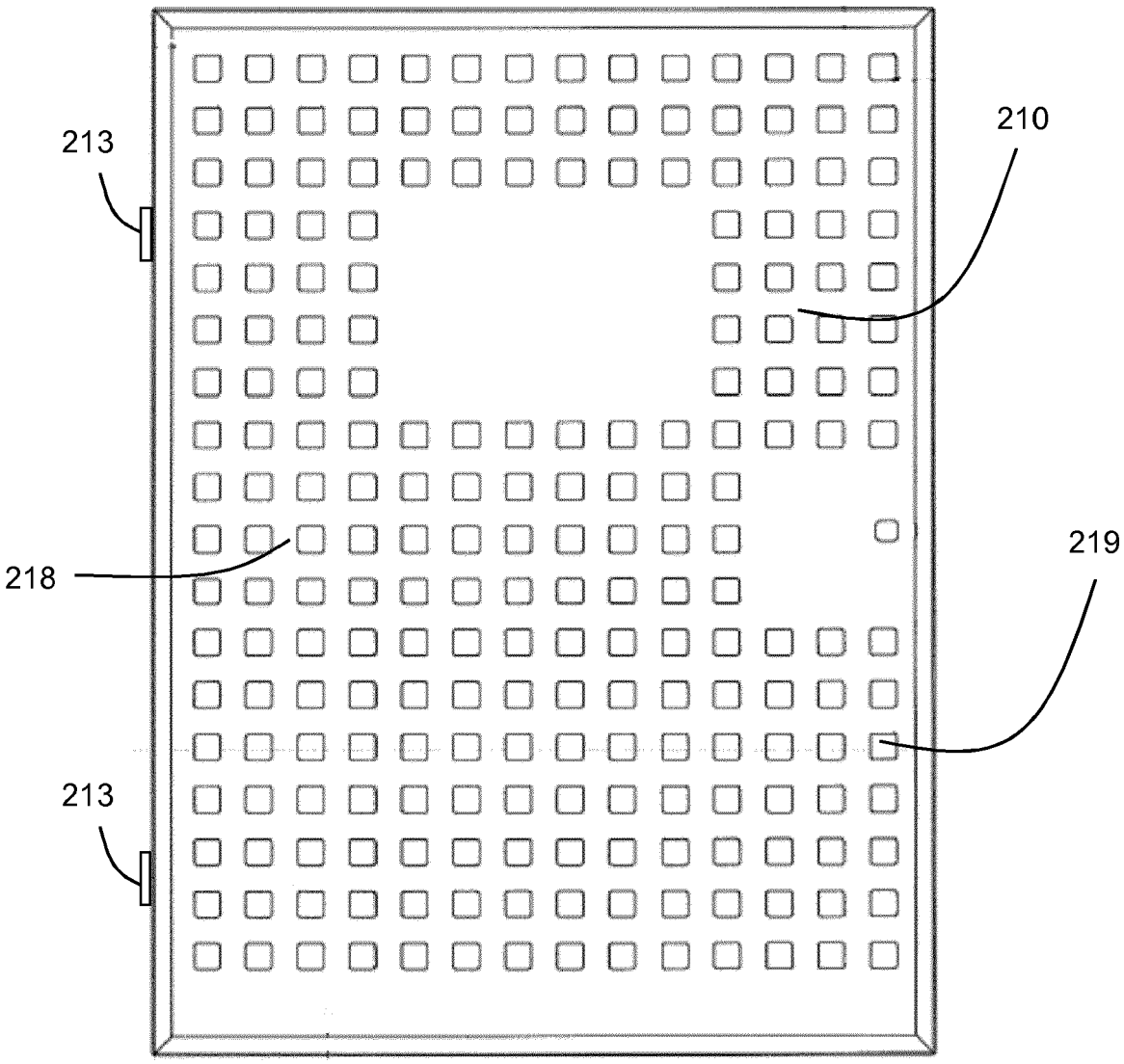


Figure 3

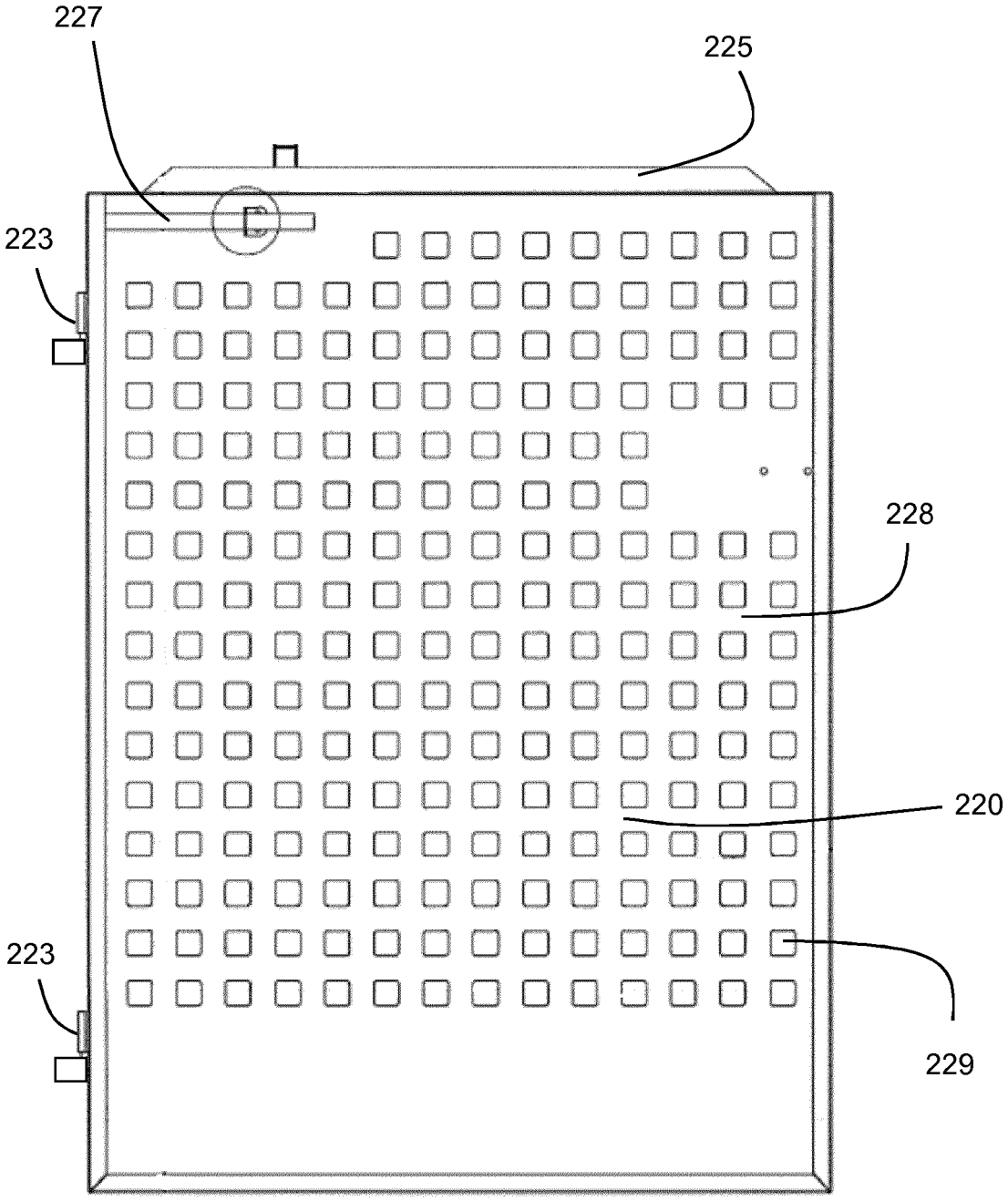


Figure 4

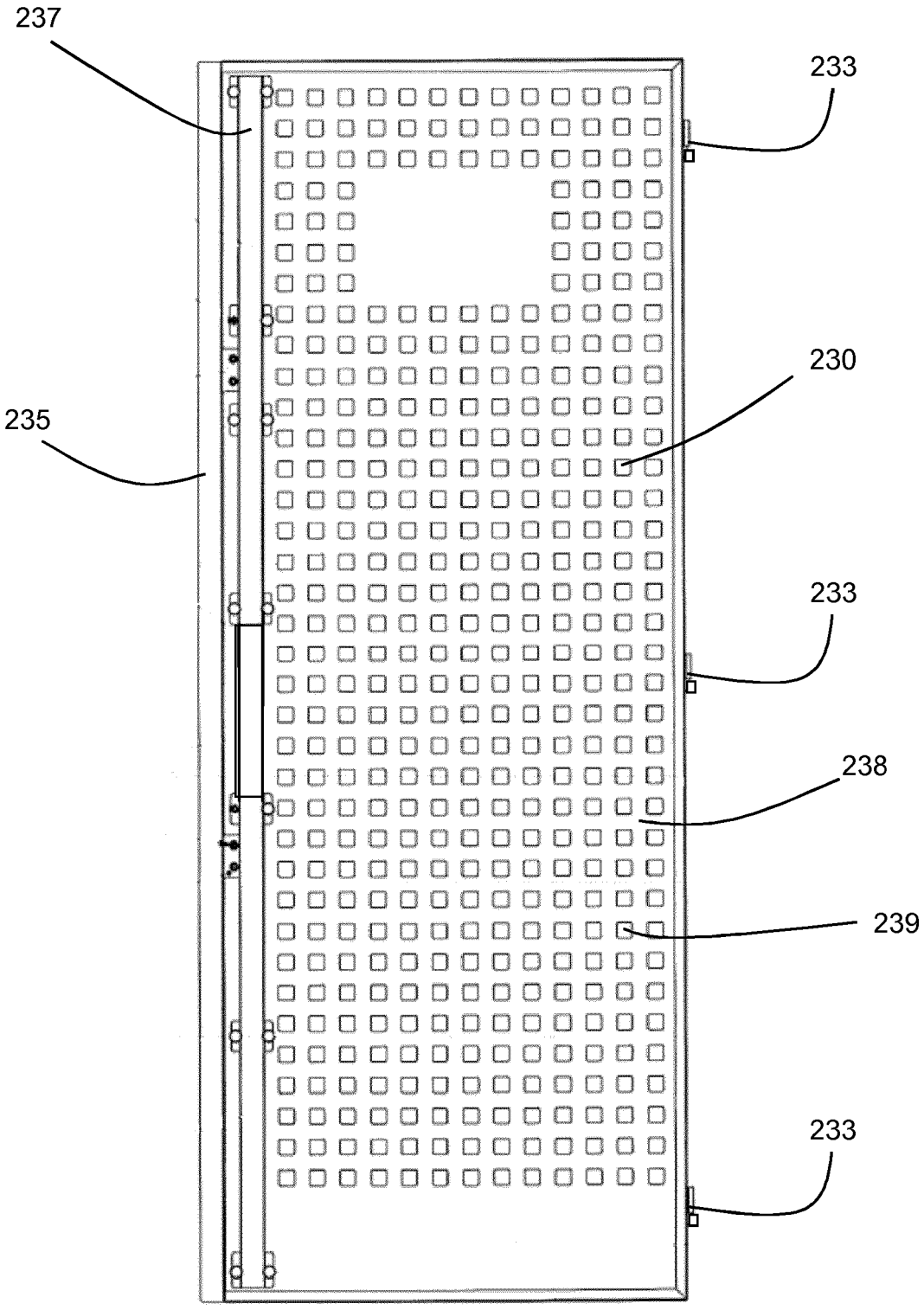


Figure 5

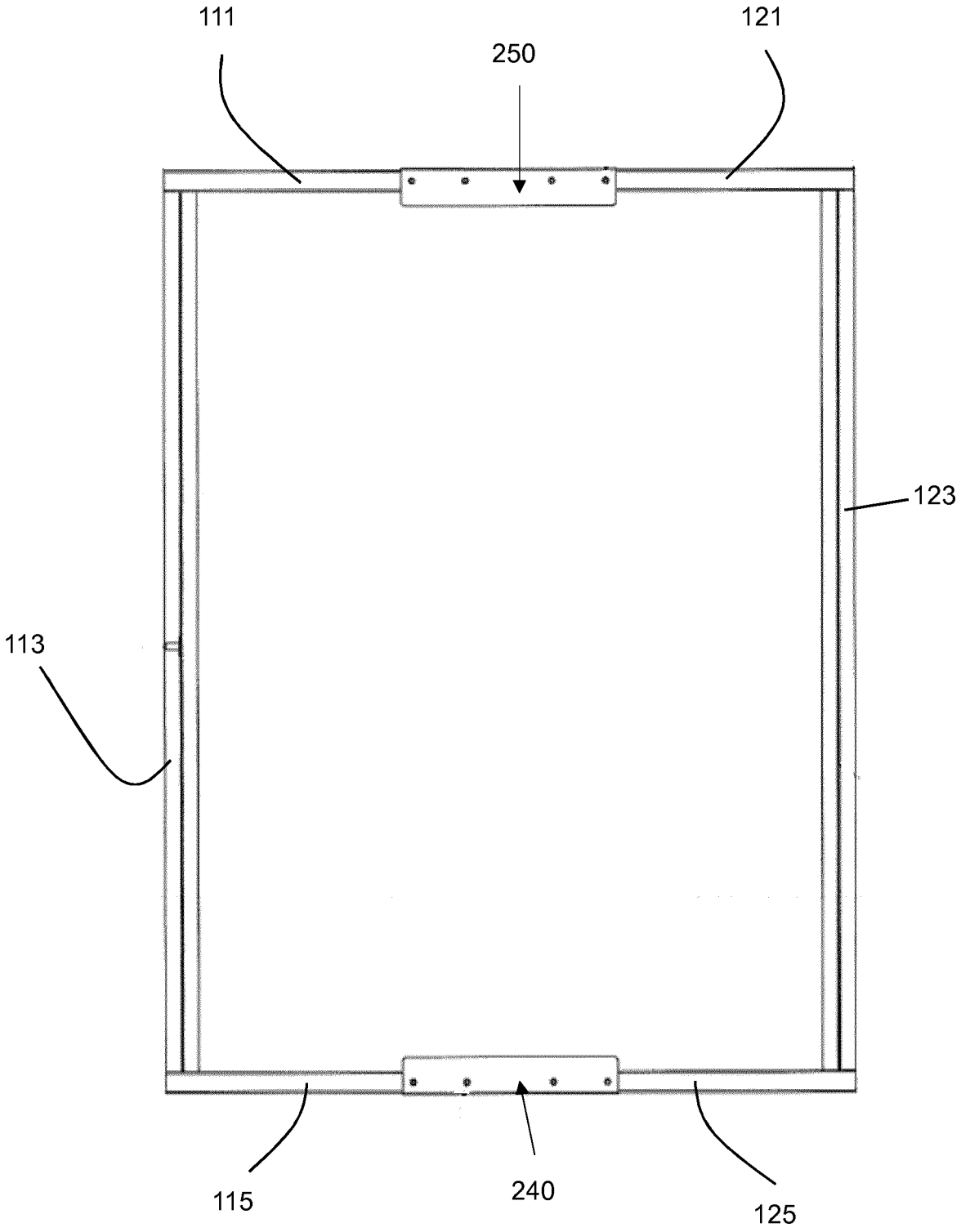


Figure 6

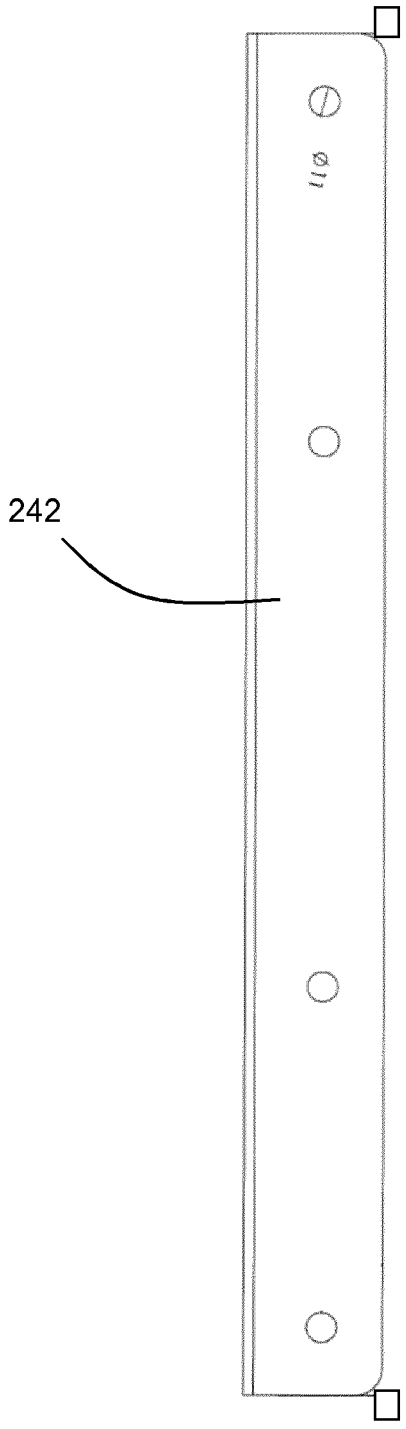


Figure 7a

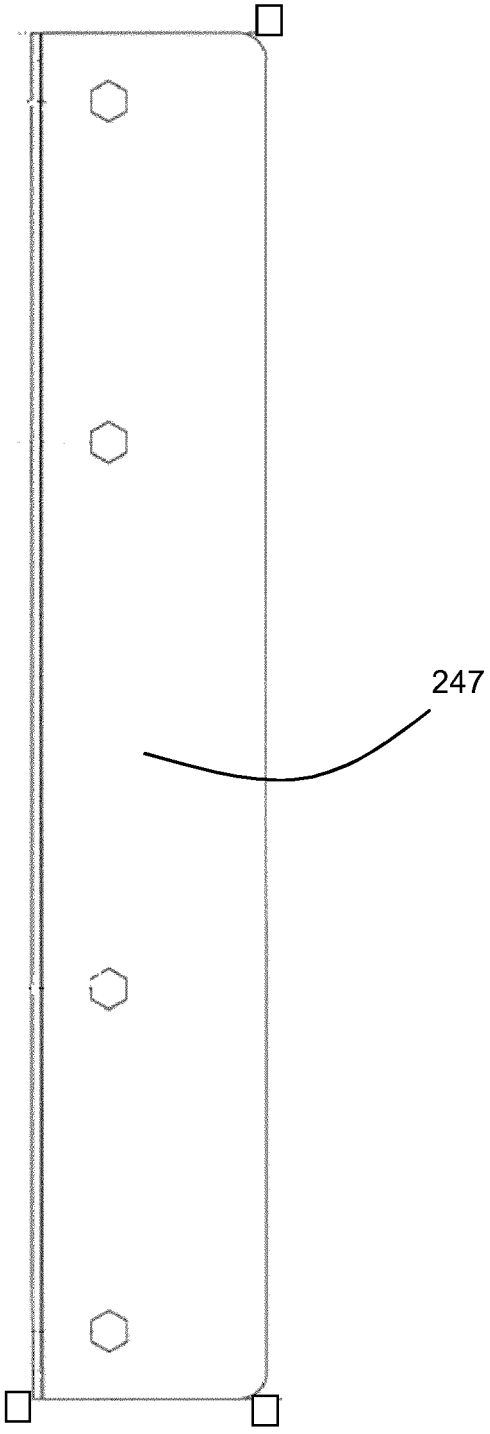


Figure 7b

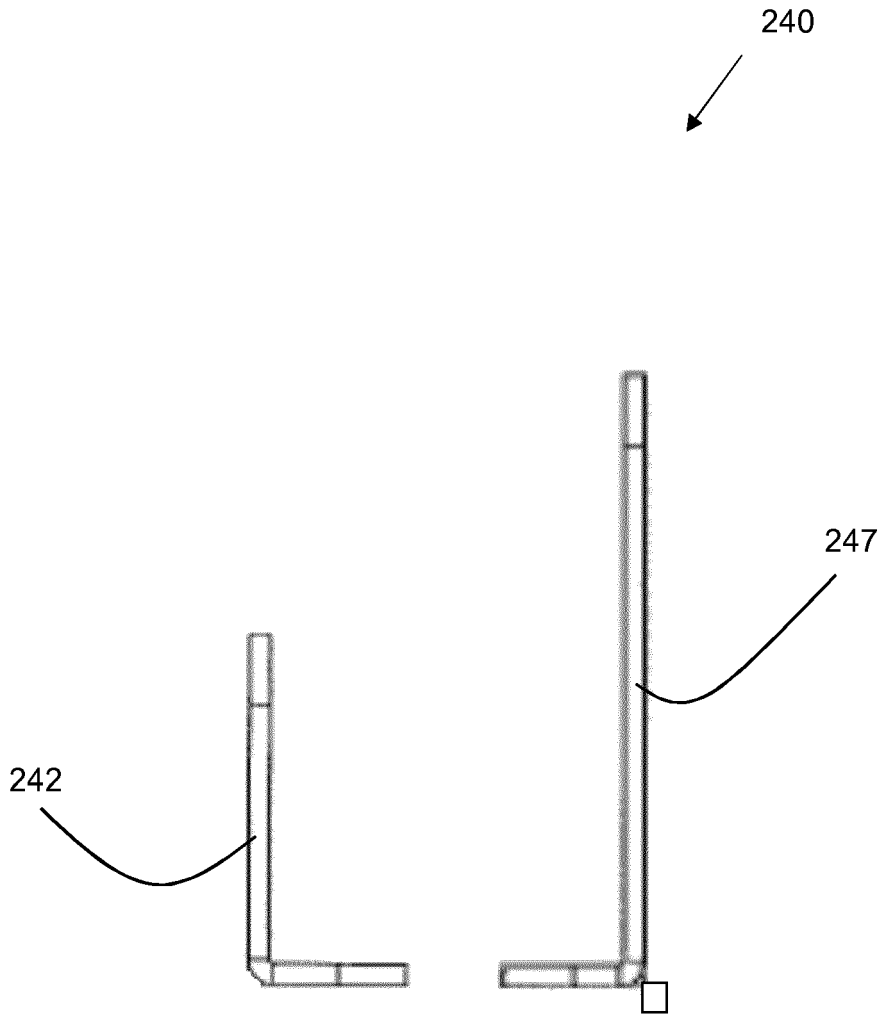
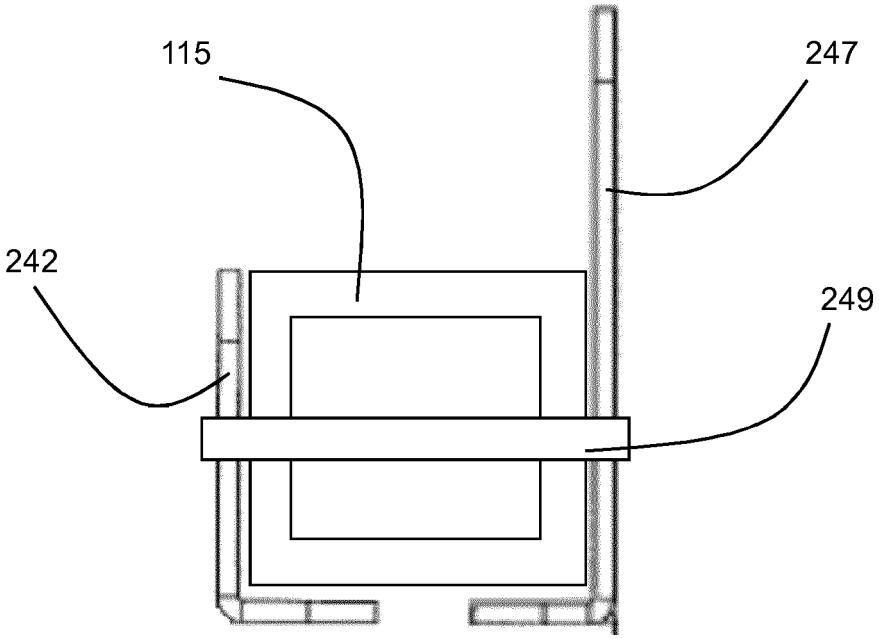


Figure 8



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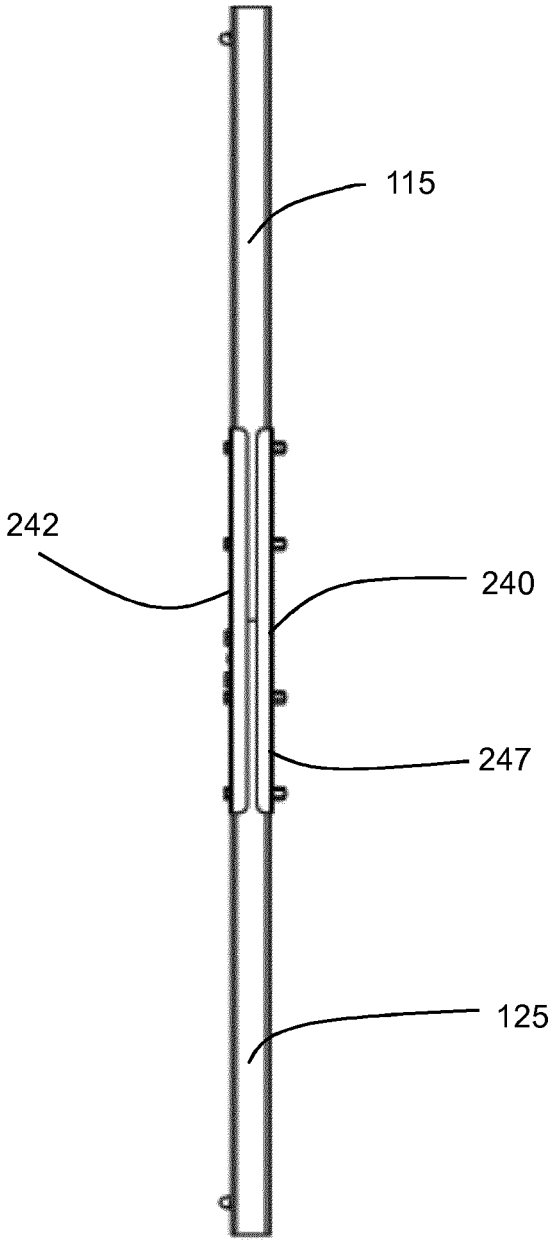

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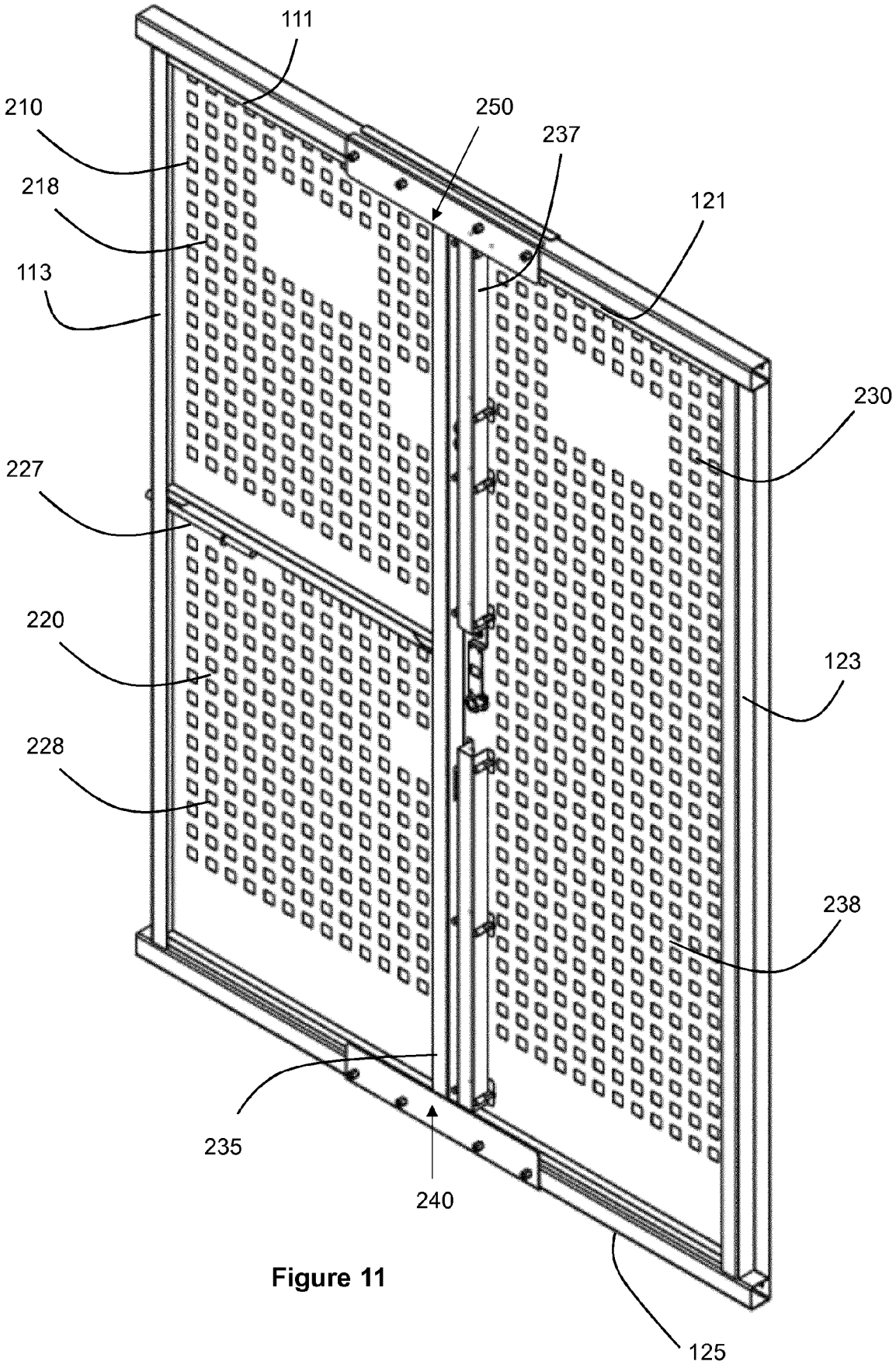

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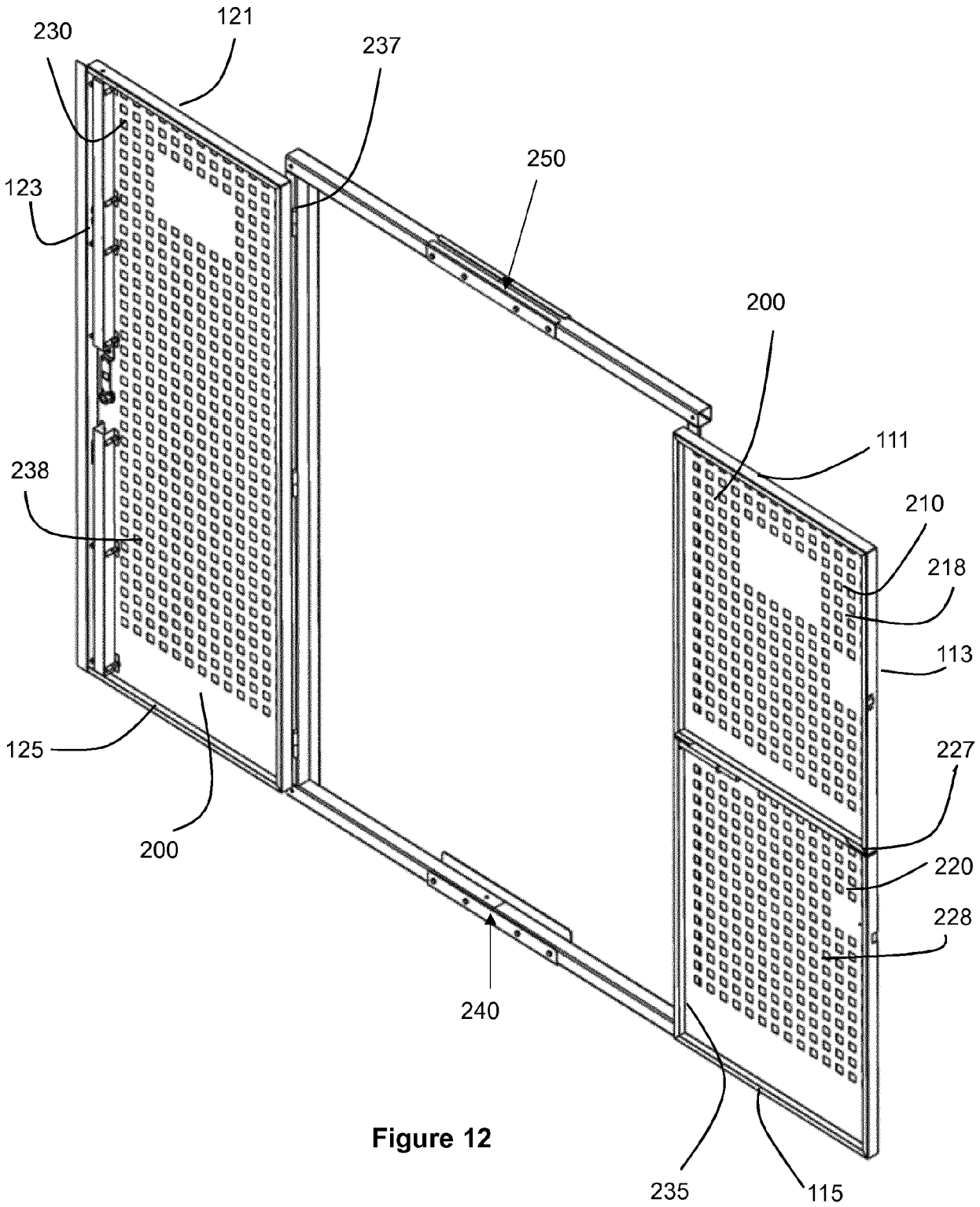
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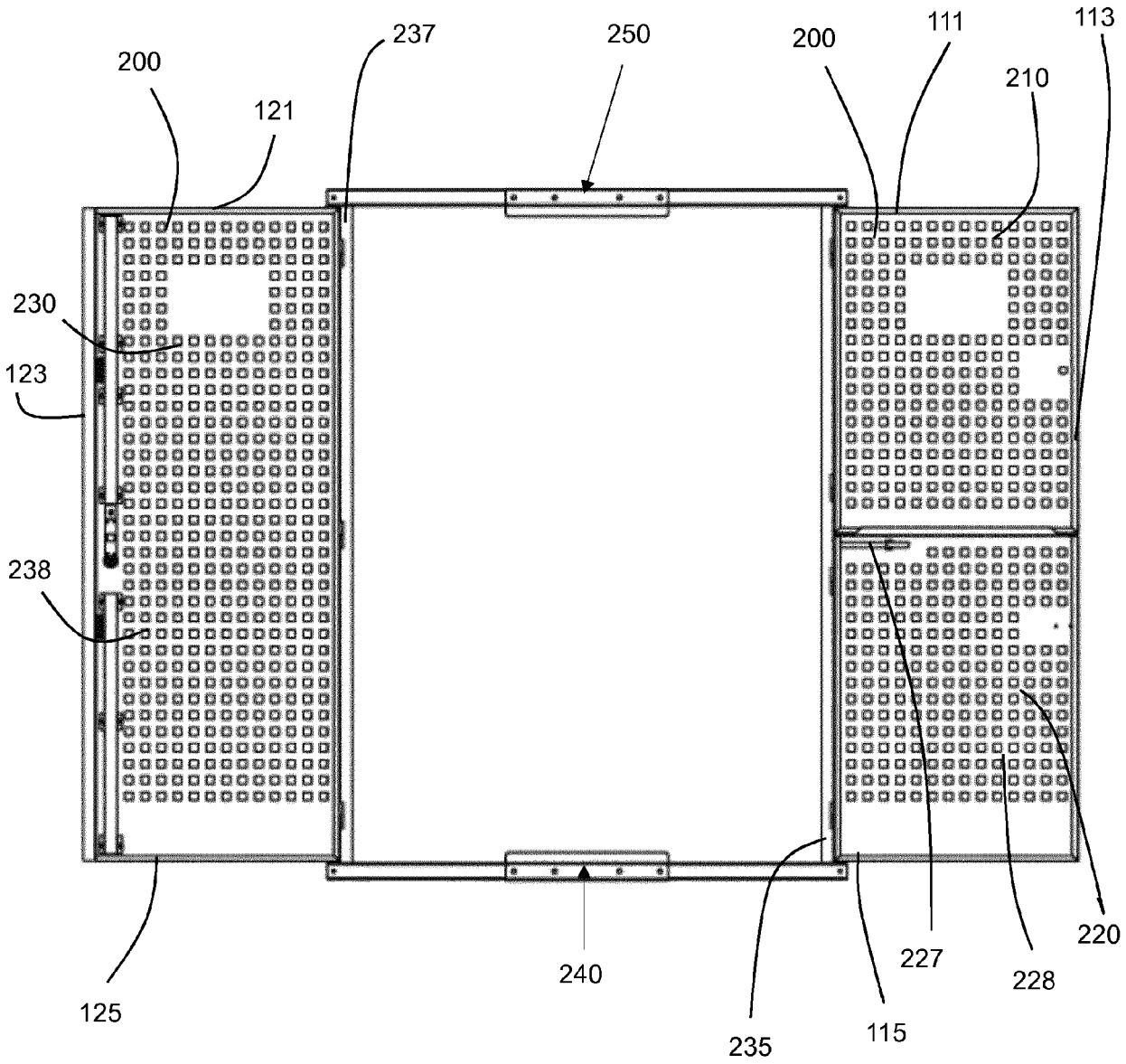
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Figure 13

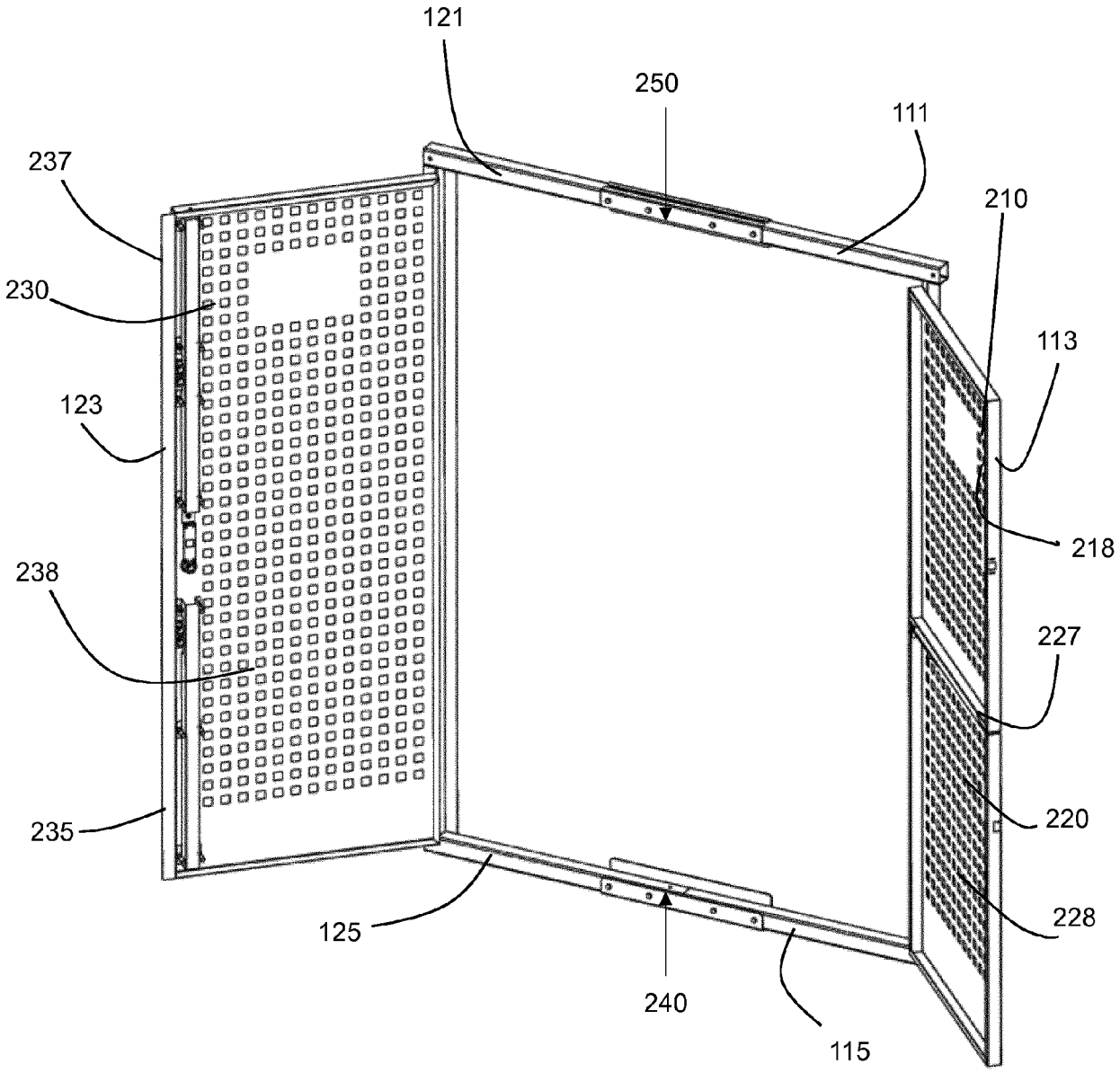
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Figure 14

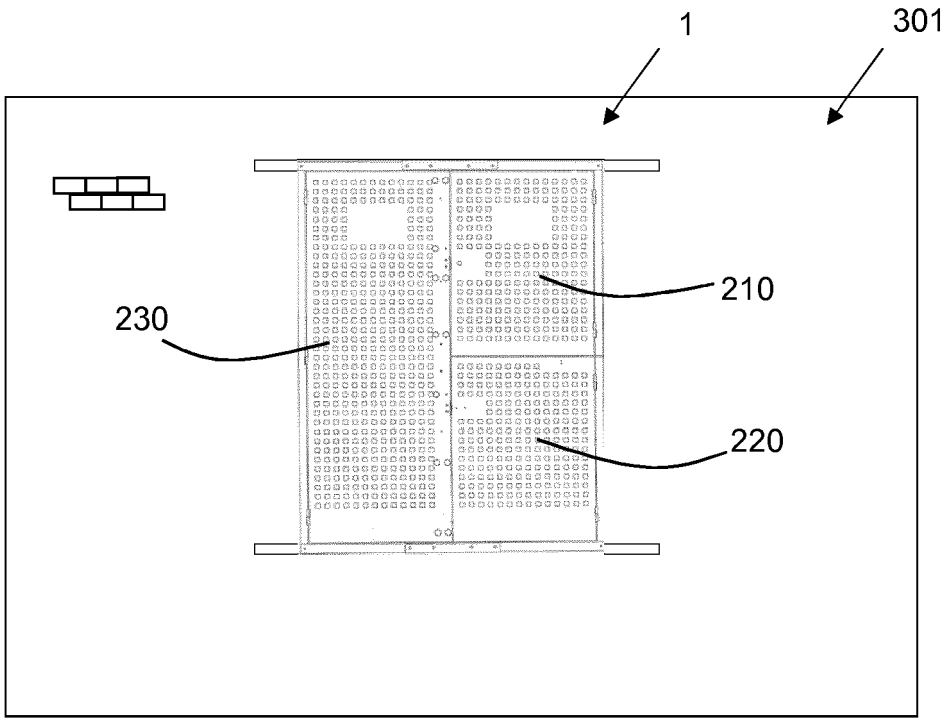

Figure 15

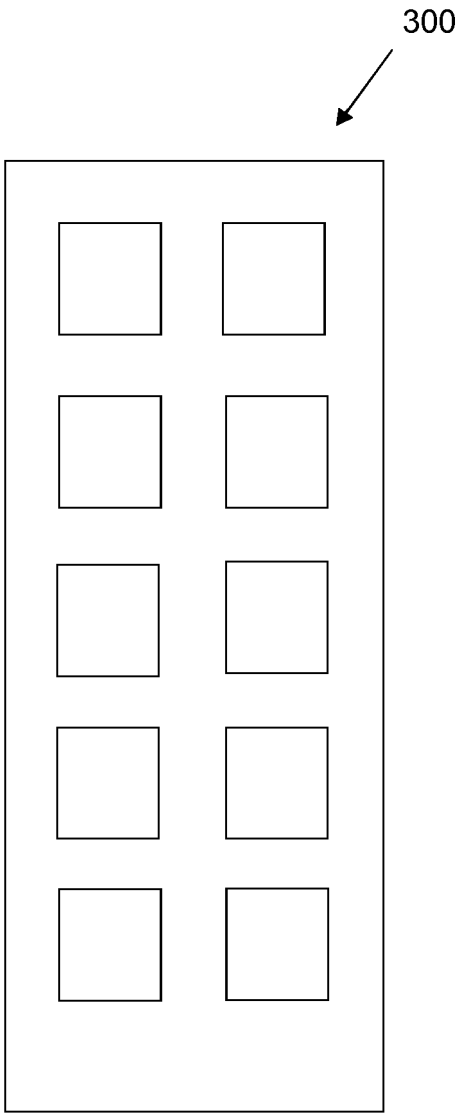

Figure 16

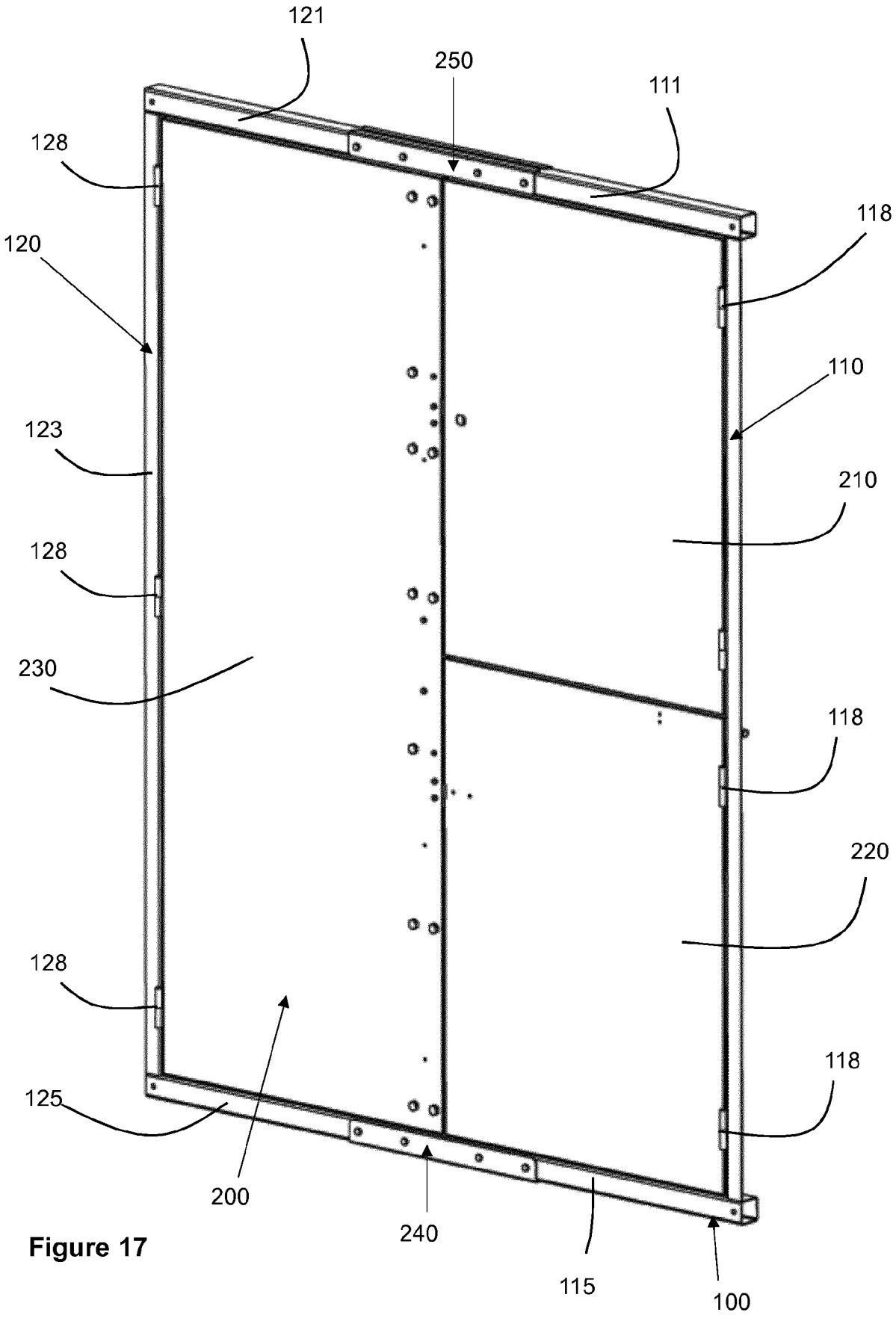
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Figure 17

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EUROPEAN SEARCH REPORT

Application Number
EP 18 15 2642

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E06B
E04G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 June 2018	Demeester, Jan

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