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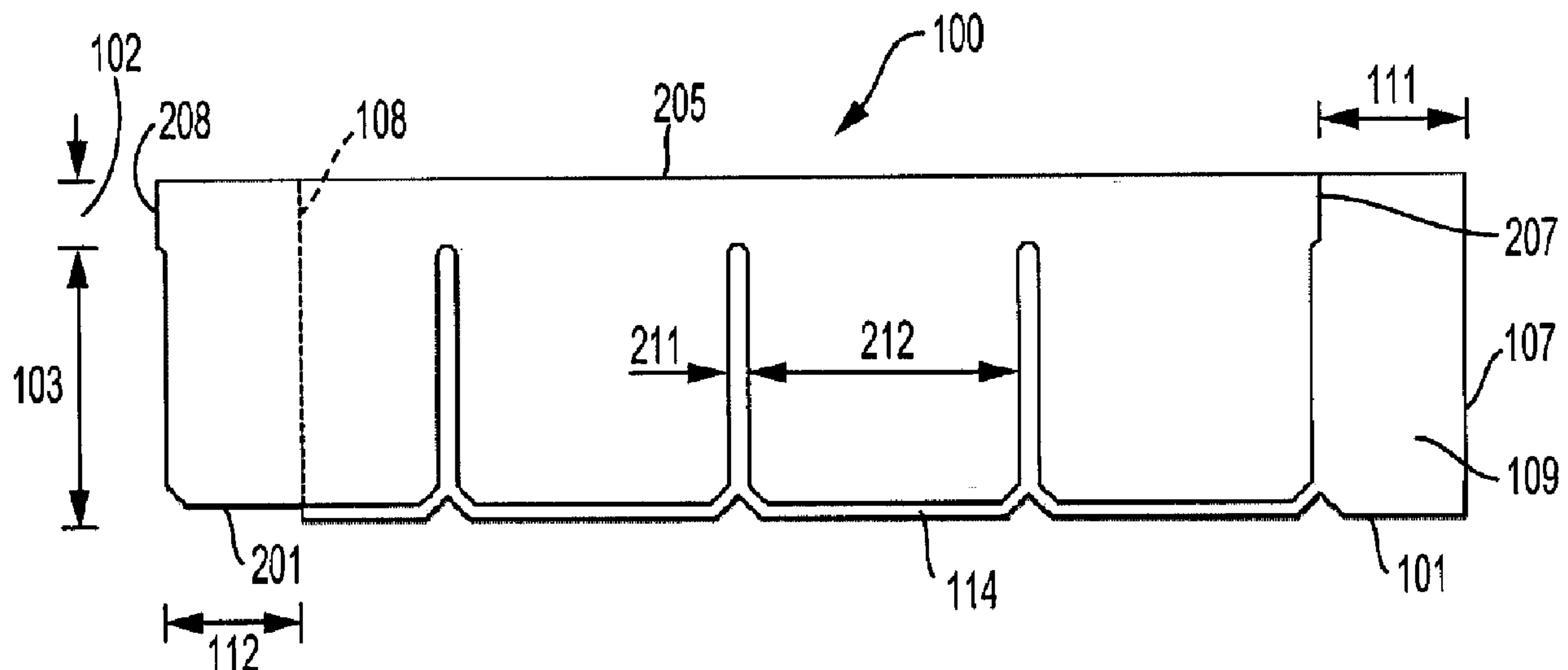
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(54) **Titre : BARDEAUX DE TOITURE MULTICOUCHES, DE POIDS REDUIT, ET METHODE D'INSTALLATION DESDITS BARDEAUX**
(54) **Title: MULTI-LAYER ROOFING SHINGLES AND METHODS FOR INSTALLING THEM**



(57) **Abrégé/Abstract:**

One aspect of the disclosure is roofing shingle including a first shingle layer having a top surface, a first side edge, and a second side edge positioned opposite the first side edge. The roofing shingle also includes a second shingle layer at least partially laminated to the top surface of the first shingle layer, where the second shingle layer includes a first side edge offset a sidelap distance from the first side edge of the first shingle layer such that a side portion of the top surface of the first shingle layer is exposed, and a second side edge extending beyond the second side edge of the first shingle layer so as to overlap the second side edge of the first shingle layer by the sidelap distance.

ABSTRACT OF THE DISCLOSURE

One aspect of the disclosure is roofing shingle including a first shingle layer having a top surface, a first side edge, and a second side edge positioned opposite the first side edge. The roofing shingle also includes a second shingle layer at least partially laminated to the top surface of the first shingle layer, where the second shingle layer includes a first side edge offset a sidelap distance from the first side edge of the first shingle layer such that a side portion of the top surface of the first shingle layer is exposed, and a second side edge extending beyond the second side edge of the first shingle layer so as to overlap the second side edge of the first shingle layer by the sidelap distance.

MULTI-LAYER ROOFING SHINGLES AND METHODS FOR INSTALLING THEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of priority of U.S. Provisional Patent Application no. 62/651096, filed March 31, 2018.

BACKGROUND OF THE DISCLOSURE

1. Field of the Disclosure

[0002] The present disclosure relates generally to roofing shingles and methods for installing them. The present disclosure relates more particularly to multi-layered roofing shingles having overlapping side butt joints.

2. Technical Background

[0003] The two most common types of bituminous (e.g., asphalt) roofing shingles are three-tab shingles and architectural or “laminated” shingles. Three-tab shingles are generally formed from a single bituminous sheet having an exposure zone and a headlap zone, with three distinct “tabs” defined by two elongated notches between the tabs. The notches extend from a bottom edge of the shingle, through at least part of the exposure zone toward the headlap zone. The shingles are laid in lateral rows on a roof in an edge-to-edge manner. To prevent the infiltration of water between the joints formed where the sides of two adjacent shingles meet, the exposure zones of an upper row of shingles are generally installed over the headlap zones of a lower row of shingles, in a repeating pattern where the joints are laterally staggered between rows. Due to this headlap requirement, the headlap zone of a traditional shingle has a height that is greater than the height of the exposure zone.

[0004] Architectural shingles also generally include an exposure zone and a headlap zone. The exposure zone of an architectural shingle is typically composed of a top bituminous sheet that includes tabs (e.g., so-called “dragon’s teeth”) that cover respective portions of a

continuous bottom bituminous sheet. The headlap zone is typically composed solely or mostly of the top bituminous sheet. The top and bottom sheets are laminated together to present a layered appearance. Due to the headlap requirement noted above, the relative sizes of the exposure zone and the headlap zone are generally the same as those noted above.

[0005] Accordingly, what is needed is an improved roofing shingle that provides similar protection from water infiltration but utilizes less material.

SUMMARY OF THE DISCLOSURE

[0006] One aspect of the disclosure is a roofing shingle having a headlap zone disposed above an exposure zone, the roofing shingle including:

- a first shingle layer having a top surface, a top edge disposed in the headlap zone, a bottom edge disposed in the exposure zone, a first side edge, and a second side edge positioned opposite the first side edge;

- a second shingle layer at least partially laminated to the top surface of the first shingle layer, wherein the second shingle layer comprises a top edge disposed in the headlap zone, a bottom edge disposed in the exposure zone, a first side edge offset a first sidelap distance from the first side edge of the first shingle layer such that a side portion of the top surface of the first shingle layer is exposed, and a second side edge extending beyond the second side edge of the first shingle layer so as to overlap the second side edge of the first shingle layer by a second sidelap distance.

[0007] Another aspect of the disclosure is a roofing shingle system comprising:

- a first plurality of roofing shingles arranged laterally edge to edge to form a first course, the first plurality of shingles comprising:

- a first roofing shingle, wherein the first roofing shingle is the roofing shingle as described herein; and

a second roofing shingle, wherein the second roofing shingle is the roofing shingle as described herein, wherein the second side edge of the first shingle layer of the first roofing shingle and the first side edge of the first shingle layer of the second roofing shingle are abutted against each other to form a first butt joint, wherein the second side edge of the second shingle layer of the first roofing shingle and the first side edge of the second shingle layer of the second roofing shingle are abutted against each other to form a second butt joint; and

a second plurality of roofing shingles, arranged laterally edge to edge to form a second course, wherein each roofing shingle in the second plurality of roofing shingles is the roofing shingle as described herein, wherein the second course is positioned such that an exposure zone of each roofing shingle in the second plurality of roofing shingles overlaps the headlap zone of at least one of the roofing shingles in the first plurality of roofing shingles.

[0008] Another aspect of the disclosure is a roof comprising a roof deck having an upper end and a lower end, and the roofing shingle system as described herein fastened thereto, the headlap zones of the roofing shingles being disposed toward the upper end of the roof deck and the exposure zones of the roofing shingles being disposed toward the lower end of the roof deck

[0009] Another aspect of the disclosure is a method for installing a roof as described herein.

The method includes:

positioning the first roofing shingle on the roof deck;

positioning the second roofing shingle on the roof deck such that the second side edge of the first shingle layer of the first roofing shingle and the first side edge of the first shingle layer of the second roofing shingle are abutted against each other to form a first butt joint, wherein the second side edge of the second shingle layer of the first roofing shingle and the first side edge of the second shingle layer of the second roofing shingle are abutted against each other to form a second butt joint;

fastening each roofing shingle in the first plurality of roofing shingles to the roof deck in a laterally edge-to-edge manner to form the first course; and

fastening each roofing shingle in the second plurality of roofing shingles to the roof deck in a laterally edge-to-edge manner to form the second course, wherein the exposure zone of each roofing shingle in the second plurality of roofing shingles overlaps the headlap zone of at least one roofing shingle of the first plurality of roofing shingles

[0010] Another aspect of the disclosure is a method for making a roofing shingle as described herein. The method includes:

positioning a second shingle layer in contact with a top surface of a first shingle layer, wherein a first side edge of the second shingle layer is offset a first sidelap distance from a first side edge of the first shingle layer such that a side portion of the top surface of the first shingle layer is exposed, and wherein a second side edge of the second shingle layer extends beyond a second side edge of the first shingle layer so as to overlap the second side edge of the first shingle layer by a second sidelap distance; and

at least partially laminating the second shingle layer to the top surface of the first shingle layer.

[0011] Additional aspects of the disclosure will be evident from the disclosure herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The accompanying drawings are included to provide a further understanding of the methods and devices of the disclosure, and are incorporated in and constitute a part of this specification. The drawings are not necessarily to scale, and sizes of various elements may be distorted for clarity. The drawings illustrate one or more embodiment(s) of the disclosure, and together with the description serve to explain the principles and operation of the disclosure.

[0013] FIG. 1 is a schematic plan view of a roofing shingle according to one embodiment of the disclosure.

[0014] FIG. 2 is a schematic plan view of a first shingle layer of a roofing shingle according to one embodiment of the disclosure.

[0015] FIG. 3 is a schematic plan view of a second shingle layer of a roofing shingle according to one embodiment of the disclosure.

[0016] FIG. 4 is a schematic plan view of a roofing shingle according to another embodiment of the disclosure.

[0017] FIG. 5 is a schematic plan view of a first shingle layer of a roofing shingle according to one embodiment of the disclosure.

[0018] FIG. 6 is a schematic plan view of a second shingle layer of a roofing shingle according to one embodiment of the disclosure.

[0019] FIG. 7 is a schematic plan view of a roofing shingle system on a roof deck according to another embodiment of the disclosure.

[0020] FIG. 8 is a schematic plan view of a roofing shingle system on a roof deck according to another embodiment of the disclosure.

[0021] FIG. 9 is a block diagram of a method for installing a roofing shingle system on a roof deck according to another embodiment of the disclosure.

[0022] FIG. 10 is a block diagram of a method for making a roofing shingle according to another embodiment of the disclosure.

DETAILED DESCRIPTION

[0023] The present inventors have noted disadvantages of conventional roofing shingles. In particular, their substantial headlap requirement necessitates a shingle that is rather large for the exposed area that the shingle actually contributes to the roof. For example, a traditional shingle which may have a 6 inch exposure height requires another 6 inches of headlap height, and may require an additional 2 inches of overlap to ensure that the lateral joints between shingles are adequately protected from water infiltration.

[0024] The present inventors have noted that conventional architectural shingles generally have at least two shingle layers, which do not necessarily need to be positioned with their side edges aligned. Rather, the side edges of the top and bottom layers of an architectural shingle may be laminated together in a staggered arrangement such that, when two such shingles are abutted side by side, a shiplap joint is formed. Moreover, a single joint that extends all the way through both layers of two abutting shingles does not exist. Consequently, the traditional and substantial headlap between shingle layers is no longer needed, and the height of the headlap zone of the roofing shingle may be dramatically reduced.

[0025] Accordingly, one aspect of the disclosure is a roofing shingle having a first shingle layer and a second shingle layer which are laminated together in a laterally offset arrangement, such that the side edges of the first shingle layer and the second shingle layer overlap each other.

[0026] One embodiment of such a roofing shingle is described with respect to Figures 1-3 below. Figure 1 shows a roofing shingle 100 with a headlap zone 102 disposed above an exposure zone 103. The roofing shingle 100 is composed of a first shingle layer 101 and second shingle layer 201, which are shown separately in Figures 2 and 3, respectively. As can be seen in Figures 1 and 2, the first shingle layer 101 may include a top surface 104, a top edge 105 disposed in the headlap zone 102 and a bottom edge 106 disposed in the exposure zone

103. The first shingle layer 101 further includes a first side edge 107 and second side edge 108 positioned opposite the first side edge 107. The example shown in Figures 2 and 3, the first side edge 107 is the right side, and the second side edge 108 is the left side. The first shingle layer may further include one or more notches 110 in the bottom edge 106, which will be discussed further below.

[0027] As shown in Figures 1 and 2, the first shingle layer 101 is rectangular, and the first and second side edges 107 and 108 are parallel. However, in some implementations, the first and second side edges 107 and 108 may be parallel, yet the first shingle layer 101 may take the shape of a parallelogram. In some other embodiments, the first and second side edges 107 and 108 may not be parallel, and the first shingle layer may take the shape of a trapezoid. Other examples are also possible.

[0028] As noted above the roofing shingle 100 also includes a second shingle layer 201, which may be at least partially laminated to the top surface 104 of the first shingle layer 101, as shown in Figure 1. For example, the second shingle layer 201 may be at least partially laminated to the top surface 104 of the first shingle layer 101 using a hot-melt adhesive or an asphaltic laminating adhesive, among other possibilities. As can be seen with reference to Figures 1 and 3, the second shingle layer 201 includes a top edge 205 disposed in the headlap zone 102 and a bottom edge 106 disposed in the exposure zone 103.

[0029] The second shingle layer 201 may include a first side edge 207, which is the right side edge as shown in the example of Figures 1 and 3. The first side edge 207 may be offset a first sidelap distance 111 from the first side edge 107 of the first shingle layer 101 such that a side portion 109 of the top surface 104 of the first shingle layer 101 is exposed. As shown in Figure 1, the side portion 109 of the top surface 104 of the roofing shingle 100 is not covered by the second shingle layer 201.

[0030] Further, the second shingle layer 201 may include a second side edge 208 that extends beyond the second side edge 108 of the first shingle layer 101 so as to overlap the second side edge 108 of the first shingle layer 101 by a second sidelap distance 112. In Figure 1, the portion of the second side edge 108 of the first shingle layer 101 is that is positioned beneath the second shingle layer 201 is shown in a dashed line.

[0031] Accordingly, the roofing shingle 100 may be abutted edge to edge with another roofing shingle 100 such that a shiplap joint is formed between the first and second shingle layers. The joint formed between the two first shingle layers will be positioned beneath one of the second shingle layers, and the joint formed between the two second shingle layers will be positioned over one of the first shingle layers. In this arrangement, neither joint provides a direct path for water to penetrate beneath the roofing shingle 100. As a result, the required height for the headlap zone 102 of the roofing shingle 100 may be substantially reduced.

[0032] In particular, unlike the traditionally abutted shingles discussed above, where the entire exposure zone of a given shingle must be placed atop the headlap zone of an adjacent shingle to account for the joints, the majority of the exposure zone 103 of the roofing shingle 100 can be placed directly on the roof deck, or on whatever underlayment is used. This may allow, for example, a height of the headlap zone 102 to be less than a height of the exposure zone 103, which is not possible in traditionally abutted shingles, as discussed above. In some embodiments as otherwise described herein, the headlap zone 102 may be no greater than, for example, 2 inches, while the height of the exposure zone 103 may be 4 inches or more. For instance, in some implementations, the exposure zone 103 may have a height of 8 inches or more, while the headlap zone 102 may be only 2 inches, to provide sufficient vertical overlap of the joint between adjacent siding courses.

[0033] Conventional shingle materials can be used in the roofing shingles of the present disclosure. In some examples, the first shingle layer 101 and the second shingle layer 201 may

be formed from the same material. For example, the first shingle layer 101 and the second shingle layer 201 may be formed from respective fiberglass or felt mats that are coated with a bituminous coating (e.g., asphalt) and weather-resistant roofing granules. Such mats may be formed with other conventional materials known to one of ordinary skill in the art as well.

[0034] Further, the first shingle layer 101 may have a thickness that is equal to a thickness of the second shingle layer 201. For instance, in some implementations, the first shingle layer 101 and the second shingle layer 201 may be cut from the same fiberglass mat. In other examples, the two shingle layers may have the same thickness, but they may have different colors. In other examples, the first shingle layer 101 and the second shingle layer 201 may have different thicknesses.

[0035] In some implementations, the first sidelap distance 111 may be substantially the same as the second sidelap distance 112, such that the first shingle layer 101 and the second shingle layer 201 of the roofing shingle 100 will both abut the opposing first and second shingle layers of an adjacent roofing shingle 100. In some other embodiments, the second sidelap distance 112 may be greater than the first sidelap distance 111, or the second sidelap distance 112 may be less than the first sidelap distance 111.

[0036] In some embodiments as otherwise described herein, the bottom edge 106 of the first shingle layer 101 may be substantially coextensive with the bottom edge 206 of the second shingle layer 201. In other examples, such as the roofing shingle 100 shown in Figure 1, the bottom edge 206 of the second shingle layer 201 may be offset from the bottom edge 106 of the first shingle layer 101 such that a bottom portion 114 of the top surface 104 of the first shingle layer 101 is exposed. As can be seen with reference to Figure 1, this may leave small portion of the second side edge 108 of the first shingle layer 101 that is not covered by the second shingle layer 201, and thus, a small portion of the joint between two adjacent first shingle layers would not be covered by the second shingle layer 201, and may provide a direct path for water to

travel beneath the roofing shingle 100. However, once installed, this small portion located at the bottom edge 106 of the first shingle layer 101 will be placed atop the headlap zone 103 of an adjacent shingle, and thus the necessary overlap may be provided.

[0037] Similarly, the top edge 105 of the first shingle layer 101 may be substantially coextensive with the top edge 205 of the second shingle layer 201, as shown in Figure 1. In some other examples, the top end 205 of the second shingle layer 201 may extend beyond the top edge 105 of the first shingle layer 101 so as to overlap the top edge 105 of the first shingle layer 101. Such an example can be seen in the roofing shingle 100 shown in Figure 4 and discussed below.

[0038] In some embodiments as otherwise described herein, the top shingle layer 201 may include a plurality of tabs formed in the exposure zone of the roofing shingle 100. The plurality of tabs, such as the plurality of tabs 209 shown in Figure 3, may be separated by one or more gaps, such as the gaps 210, extending from the bottom edge 206 of the second shingle layer 201 to the headlap zone 103 of the roofing shingle 100. This arrangement may help to simulate the appearance of cedar shake roofing shingles, which may be desirable in some situations. In some implementations, the one or more tabs 209 may be formed in the second shingle layer 201 by cutting (e.g., via a knife, such as on those on a knife roll) into the second shingle layer 201, for example, after the second shingle layer 201 is formed but before it is laminated to the first shingle layer 101.

[0039] In some implementations, the bottom edge 106 of the first shingle layer 101 may include one or more notches, such as the notches 110 shown in Figures 1 and 2. For example, each notch 110 in the one or more notches 110 may be aligned with a respective gap 210 in the second shingle layer 201. This may serve to break up what would otherwise be a continuous line along the bottom edge 106, which may further contribute to the simulated appearance of cedar shake roofing, as noted above.

[0040] In some embodiments as otherwise described herein, at least the first side edge 207 of the second shingle layer 201 may be disposed completely within the headlap zone 102, as shown in Figure 1. In this regard, the first side edge 207, which may be the portion of the roofing shingle 100 that abuts the second side edge 208 of an adjacent shingle, may be distinguished from the right side of the right-most tab 209 of the second shingle layer 201 shown in Figures 1 and 3, which forms one side of an eventual gap 210 such that it will not abut any portion of an adjacent shingle. The second side edge 208 is similarly situated in the roofing shingle 100, although other arrangements are also possible.

[0041] As can be seen in Figure 1, the second edge 208 of the second shingle layer 201 extends beyond the second edge 108 of the first shingle layer 101 such that one of the tabs 209 in the plurality of tabs 209 is positioned over the second edge 108 of the first shingle layer 201. Further, the first shingle layer 101 may be positioned with respect to the tabs 209 and gaps 210 such that the second edge 108 of the first shingle layer 101 is at least a minimum distance from the nearest gap 210. The minimum distance may be, for example, 1 inch.

[0042] In some embodiments as otherwise described herein, the one or more gaps 210 may each have the same width 211, as shown in Figure 3. Alternatively, the gap widths may be varied if a more irregular appearance is desired. For example, each gap 210 in the one or more gaps 210 may have a width 211 that is different from a width of at least one adjacent gap 210. The width 211 of a given gap 210 may be relatively narrow compared to the width 212 of one of the tabs 209 plurality of tabs 209. For instance, each gap 210 may have a width 211 of at least 0.5 inches. In other implementations, the width 211 of a given gap 210 may meet or exceed the width of a given tab 209. In some cases, each gap 210 may have a width 211 of at least 4 inches.

[0043] Similarly, in some examples of the roofing shingle 100 discussed herein, each tab 209 in the plurality of tabs 209 may have the same width 212, as shown in Figure 1. However, as

noted above, the tab widths may also be varied such that each tab 209 in the plurality of tabs 209 has a width 212 that is different from a width of at least one adjacent tab 209. In some embodiments, each tab 209 in the plurality of tabs 209 may have a respective width 212 of at least 1 inches, e.g., at least 2 inches, at least 4 inches, or at least 6 inches, among other possibilities. Different gap sizes and widths may be combined with different tab sizes and widths in numerous of different configurations for a given roofing shingle 100.

[0044] Turning now to Figure 4, another example of a roofing shingle 100 is shown in a different arrangement than that shown in Figure 1, although most of the features discussed above and shown in Figures 1-3 are present. For example, the roofing shingle 100 of Figure 4 includes a first shingle layer 101, shown separately in Figure 5, as well as a second shingle layer 201, shown separately in Figure 6, that is at least partially laminated to the top surface 104 of the first shingle layer 101.

[0045] As noted above, the top end 205 of the second shingle layer 201 in Figure 4 extends beyond the top edge 105 of the first shingle layer 101 so as to overlap the top edge 105 of the first shingle layer 101. Accordingly, the hidden portion of the top edge 105 is shown in a dashed line in Figure 4. This configuration may be desirable in some situations, as it may result in using less material for the first shingle layer 101. Further, because the overlap of the top edge 205 is located in the headlap zone 102, the top-most portion of the joints formed between adjacent second shingle layers—which does not have a first shingle layer 101 beneath it—will be covered by the exposure zone 103 of an adjacent shingle once installed.

[0046] In addition, the bottom edge 105 of the first shingle layer 101 of the roofing shingle 100 shown in Figure 4 is substantially coextensive with the bottom edge 205 of the second shingle layer 201. Further, each gap 210 is much wider than in the example roofing shingle 100 of Figure 1, exposing much more of the top surface 104 of the first shingle layer 101.

[0047] In some embodiments as otherwise described herein, and as shown in the example roofing shingle 100 shown in Figure 4, each gap 210 in the one or more gaps 210 may include a respective width 211 that increases from the bottom edge 106 of the first shingle layer 101 toward the headlap zone 102 of the roofing shingle 100. In this arrangement, each tab 209 may also include a respective width 212 that decreases from the bottom edge 206 of the second shingle layer 201 toward the headlap zone 102 of the roofing shingle 100.

[0048] As noted above, the width 211 of each gap 210 of the roofing shingle 100 may be the same. For instance, with reference to the example roofing shingle 100 shown in Figure 4, the width 211 of each gap 210 may be the same at the bottom edge 106 of the first shingle layer 101, and may vary at the same rate toward the headlap zone 102. Alternatively, the gap widths 211 may be varied within a given roofing shingle 100, not only in their starting width 100 at the bottom edge 105 of the first shingle layer 101, but also in the angle of one or both sides of a given gap 210. As noted above, this may provide an irregular pattern that may simulate the appearance of a cedar shake roof, which may be desirable in some cases.

[0049] Another embodiment of the disclosure is a roofing shingle system that includes a plurality of roofing shingles, such as the roofing shingle 100 as discussed in the examples above. For example, Figure 7 shows a schematic perspective view of a roofing shingle system 300 according to another embodiment of the disclosure.

[0050] For instance, the siding system 300 may include a first plurality of roofing shingles 100 arranged laterally edge to edge to form a first course 120. The first plurality of shingles may include a first roofing shingle 100a and a second roofing shingle 100b, as shown in Figure 7. For instance, the first roofing shingle 100a and the second roofing shingle 100b may both take the form of the roofing shingle 100 discussed in the examples above. Further, the second side edge 108a of the first shingle layer 101a of the first roofing shingle 100a and the first side edge 107b of the first shingle layer 101b of the second roofing shingle 100b are abutted against each

other to form a first butt joint 113. The first butt joint 113 is shown as a dashed line, as it is positioned beneath the second shingle layer 201b of the second roofing shingle 100b such that the second shingle layer 201b of the second roofing shingle 100b substantially covers the first butt joint 113.

[0051] Further, the second side edge 208a of the second shingle layer 201a of the first roofing shingle 100a and the first side edge 207b of the second shingle layer 201b of the second roofing shingle 100b are abutted against each other to form a second butt joint 213. As shown in the example of Figure 7, the second butt joint 213 is also shown as a dashed line, as it is positioned substantially within the headlap zone 102 such that the second butt joint 213 is covered by a second course 220 of roofing shingles.

[0052] Accordingly, the roofing shingle system 300 may further include a second plurality of roofing shingles arranged laterally edge to edge to form a second course 220. For example, each roofing shingle in the second plurality of roofing shingles may be the roofing shingle 100 discussed in the examples above. Further, the second course 220 may be positioned such that an exposure zone 303 of each roofing shingle 100 in the second plurality of roofing shingles overlaps the headlap zone 102 of at least one of the roofing shingles 100 in the first plurality of roofing shingles in the first course 120. This pattern may then be repeated with a third plurality of roofing shingles arranged in a third course positioned to overlap the headlap zone 302 of the shingles in the second course 220, and so on.

[0053] Further, Figure 7 shows a roof 400 of a structure including a roof deck 401, with the roofing shingle system 300 installed thereon. For instance, the roof deck 401 may include an upper end 402 and a lower end 403. The roofing shingle system 300 may be fastened to the roof deck 401, via fasteners such as nails, with the headlap zones of the roofing shingles disposed toward the upper end 402 of the roof deck 401 and the exposure zones of the roofing shingles being disposed toward the lower end 403 of the roof deck 401.

[0054] In some embodiments as otherwise described herein, the roof 400 may include as underlayment a weather resistant barrier 404 positioned between the roof deck 401 and the roofing shingle system 300. In some applications, the weather resistant barrier 404 may be considered a part of the roofing shingle system 300, as indicated in Figure 7. The weather resistant barrier 404 may be, for example, at least one of a bituminous mat, a woven synthetic mat, or a felt mat. Other underlayment materials are also possible.

[0055] Figure 8 shows another example of the roofing shingle system 300, including a plurality of roofing shingles similar to the roofing shingle 100 shown in Figure 4 and discussed above. However, for simplicity of illustration, the roofing shingles shown in Figure 8 include a top edge of the first shingle layer that is coextensive with the top edge of the second shingle layer. For instance, Figure 8 includes a first roofing shingle 100a and a second roofing shingle 100b in a first siding course 120, positioned beneath a second siding course 220 of similar roofing shingles. In addition, most of the features shown in Figure 7 and discussed above are also included in a similar arrangement in Figure 8.

[0056] Figure 9 is a block diagram of a method 500 for installing a roofing shingle system, such as the roofing shingle system 300, on a roof deck such as the roof deck 401.

[0057] At block 502, the method 500 includes positioning the first roofing shingle, such as the first roofing shingle 100a shown in Figures 7 and 8 and discussed as the roofing shingle 100 in the examples above, on the roof deck, such as the roof deck 401 shown in Figures 7 and 8.

[0058] At block 504, the method 500 includes positioning the second roofing shingle, such as the second roofing shingle 100b shown in Figures 7 and 8 and discussed as the roofing shingle 100 in the examples above, on the roof deck 401. The second roofing shingle 100b may be positioned such that the second side edge 108a of the first shingle layer 101a of the first roofing

shingle 100a and the first side edge 107b of the first shingle layer 101b of the second roofing shingle 100b are abutted against each other to form a first butt joint 113.

[0059] Further, the second roofing shingle 100b may be positioned such that the second side edge 208a of the second shingle layer 201a of the first roofing shingle 100a and the first side edge 207b of the second shingle layer 201b of the second roofing shingle 100b are abutted against each other to form a second butt joint 213.

[0060] At block 506, the method 500 may include fastening each shingle in the first plurality of roofing shingles, including the first roofing shingle 100a and the second roofing shingle 100b, to the roof deck 401 in a laterally edge-to-edge manner to form the first course, such as the first course 120 shown in Figures 7 and 8. For example, fastening each roofing shingle in the first plurality of roofing shingles to the roof deck 401 may include placing a fastener, such as a nail, through the first shingle layer 101 and the second shingle layer 201, and into the roof deck 401.

[0061] At block 508, the method 500 comprises fastening each roofing shingle in the second plurality of roofing shingles to the roof deck 401 in a laterally edge-to-edge manner to form the second course, such as the second course 220 shown in Figures 7 and 8, as discussed above. Further, the exposure zone 303 of each roofing shingle in the second plurality of roofing shingles may overlap the headlap zone 102 of at least one roofing shingle 100 of the first plurality of roofing shingles.

[0062] Figure 10 is a block diagram of a method 600 for making roofing shingle, such as the roofing shingle 100, as shown in the Figures and described in the examples above.

[0063] At block 602, the method 600 includes positioning a second shingle layer, such as the second shingle layer shown in Figure 3 and Figure 6, in contact with a top surface 104 of a first shingle layer, such as the first shingle layer 101 shown in Figure 2 and Figure 5, respectively. The second shingle layer 201 may be positioned such that a first side edge 207 of the second

shingle layer 201 is offset a first sidelap distance 111 from a first side edge 107 of the first shingle layer 101 such that a side portion 109 of the top surface 104 of the first shingle layer 101 is exposed, as shown in Figures 1 and 4, for example.

[0064] Additionally or alternatively, the second shingle layer 201 may be positioned such that a second side edge 208 of the second shingle layer 201 extends beyond a second side edge 108 of the first shingle layer 101 so as to overlap the second side edge 108 of the first shingle layer 101 by a second sidelap distance 112, as discussed in the examples above.

[0065] At block 604, the method 600 includes at least partially laminating the second shingle layer 201 to the top surface 104 of the first shingle layer 101. For instance, before positioning the second shingle layer 201 in contact with the top surface 104 of the first shingle layer 101, the method 600 may include applying a laminating adhesive to the top surface 104 of the first shingle layer 101. The laminating adhesive may be, for example, a hot-melt adhesive or an asphaltic laminating adhesive, among other possibilities.

[0066] Conventional methodologies for shingle construction can be used in the manufacturing of the roofing shingles as described herein.

[0067] It will be apparent to those skilled in the art that various modifications and variations can be made to the processes and devices described here without departing from the scope of the disclosure. Thus, it is intended that the present disclosure cover such modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A roofing shingle having a headlap zone disposed above an exposure zone, the roofing shingle comprising:

a first shingle layer having a top surface, a top edge disposed in the headlap zone, a bottom edge disposed in the exposure zone, a first side edge, and a second side edge positioned opposite the first side edge;

a second shingle layer at least partially laminated to the top surface of the first shingle layer, wherein the second shingle layer comprises a top edge disposed in the headlap zone, a bottom edge disposed in the exposure zone, a first side edge offset a first sidelap distance from the first side edge of the first shingle layer such that a side portion of the top surface of the first shingle layer is exposed, and a second side edge extending beyond the second side edge of the first shingle layer so as to overlap the second side edge of the first shingle layer by a second sidelap distance.

2. The roofing shingle of claim 1, wherein the bottom edge of the first shingle layer is substantially coextensive with the bottom edge of the second shingle layer.

3. The roofing shingle of claim 1, wherein the bottom edge of the second shingle layers is offset from the bottom edge of the first shingle layer such that a bottom portion of the top surface of the first shingle layer is exposed.

4. The roofing shingle of any of claims 1-3, wherein the top edge of the first shingle layer is substantially coextensive with the top edge of the second shingle layer

5. The roofing shingle of any of claims 1-3, wherein the top end of the second shingle layer extends beyond the top edge of the first shingle layer so as to overlap the top edge of the first shingle layer.
6. The roofing shingle of any of claims 1-5, wherein the sidelap distance is at least 2 inches, e.g., at least 4 inches or at least 6 inches.
7. The roofing shingle of any of claims 1-6, wherein a height of the headlap zone is less than a height of the exposure zone.
8. The roofing shingle of any of claims 1-7, wherein a height of the headlap zone is no greater than 2 inches.
9. The roofing shingle of any of claims 1-8, wherein a height of the exposure zone is at least 4 inches, e.g., at least 6 inches, or at least 8 inches.
10. The roofing shingle of any of claims 1-9, wherein the first shingle layer and the second shingle layer are formed from the same material.
11. The roofing shingle of any of claims 1-10, wherein the first shingle layer has a thickness that is equal to a thickness of the second shingle layer.
12. The roofing shingle of any of claims 1-11, wherein the first shingle layer has a thickness that is different from a thickness of the second shingle layer.

13. The roofing shingle of any of claims 1-12, wherein the first sidelap distance is substantially equal to the second sidelap distance.
14. The roofing shingle of any of claims 1-13, wherein the second shingle layer comprises a plurality of tabs formed in the exposure zone of the roofing shingle, the plurality of tabs separated by one or more gaps extending from the bottom edge of the second shingle layer to the headlap zone of the roofing shingle.
15. The roofing shingle of claim 14, wherein the bottom edge of the first shingle layer comprises one or more notches, wherein each notch in the one or more notches is aligned with a respective gap in the second shingle layer.
16. The roofing shingle of any of claims 14-15, wherein at least the first side edge of the second shingle layer is disposed completely within the headlap zone, e.g., wherein both the first side edge of the second shingle layer and the second side edge of the second shingle layer are disposed completely within the headlap zone.
17. The roofing shingle of any of claims 14-16, wherein the second edge of the second shingle layer extends beyond the second edge of the first shingle layer such that one of the tabs in the plurality of tabs is positioned over the second edge of the first shingle layer.
18. The roofing shingle of any of claims 14-17, wherein the one or more gaps each comprise the same width.
19. The roofing shingle of any of claims 14-17, wherein each gap in the one or more gaps comprises a width that is different from a width of at least one adjacent gap.

20. The roofing shingle of any of claims 14-19, wherein each gap in the one or more gaps comprises a respective width of at least 0.5 inches, e.g., at least 1 inch, or at least 2 inches, or at least 4 inches.
21. The roofing shingle of any of claims 14-20, wherein each tab in the plurality of tabs comprises the same width.
22. The roofing shingle of any of claims 14-20, wherein each tab in the plurality of tabs comprises a width that is different from a width of at least one adjacent tab.
23. The roofing shingle of any of claims 14-22, wherein each tab in the plurality of tabs comprises a respective width of at least 1 inch, e.g., at least 2 inches, at least 4 inches, or at least 6 inches.
24. The roofing shingle of any of claims 14-23, wherein each gap in the one or more gaps comprises a respective width that increases from the bottom edge of the first shingle layer toward the headlap zone of the roofing shingle, such that each tab comprises a respective width that decreases from the bottom edge of the second shingle layer toward the headlap zone of the roofing shingle.
25. A roofing shingle system comprising:
a first plurality of roofing shingles arranged laterally edge to edge to form a first course,
the first plurality of shingles comprising:
a first roofing shingle, wherein the first roofing shingle is the roofing shingle of
any of claims 1-24; and

a second roofing shingle, wherein the second roofing shingle is the roofing shingle of any of claims 1-24, wherein the second side edge of the first shingle layer of the first roofing shingle and the first side edge of the first shingle layer of the second roofing shingle are abutted against each other to form a first butt joint, wherein the second side edge of the second shingle layer of the first roofing shingle and the first side edge of the second shingle layer of the second roofing shingle are abutted against each other to form a second butt joint; and

a second plurality of roofing shingles, arranged laterally edge to edge to form a second course, wherein each roofing shingle in the second plurality of roofing shingles is the roofing shingle of any of claims 1-23, wherein the second course is positioned such that an exposure zone of each roofing shingle in the second plurality of roofing shingles overlaps the headlap zone of at least one of the roofing shingles in the first plurality of roofing shingles.

26. The roofing shingle system of claim 25, wherein the first butt joint is positioned beneath the second shingle layer of the second roofing shingle such that the second shingle layer of the second roofing shingle substantially covers the first butt joint.

27. The roofing shingle system of any of claims 25-26, wherein the second butt joint is positioned substantially within the headlap zone of the first and second roofing shingles, such that the second butt joint is covered by the second course of roofing shingles.

28. A roof comprising a roof deck having an upper end and a lower end, and the roofing shingle system of any of claims 25-27 fastened thereto, the headlap zones of the roofing shingles being disposed toward the upper end of the roof deck and the exposure zones of the roofing shingles being disposed toward the lower end of the roof deck.

29. The roof of claim 28, further comprising a weather resistant barrier layer positioned between the roof deck and the roofing shingle system.

30. The roof of claim 29, wherein the weather resistant barrier comprises at least one of a bituminous mat, a woven synthetic mat, or a felt mat.

31. A method for installing a roof according to any of claims 28-30, the method comprising:

positioning the first roofing shingle on the roof deck;

positioning the second roofing shingle on the roof deck such that the second side edge of the first shingle layer of the first roofing shingle and the first side edge of the first shingle layer of the second roofing shingle are abutted against each other to form a first butt joint, wherein the second side edge of the second shingle layer of the first roofing shingle and the first side edge of the second shingle layer of the second roofing shingle are abutted against each other to form a second butt joint;

fastening each roofing shingle in the first plurality of roofing shingles to the roof deck in a *laterally edge-to-edge manner to form the first course*; and

fastening each roofing shingle in the second plurality of roofing shingles to the roof deck in a laterally edge-to-edge manner to form the second course, wherein the exposure zone of each roofing shingle in the second plurality of roofing shingles overlaps the headlap zone of at least one roofing shingle of the first plurality of roofing shingles.

32. The method of claim 31, wherein fastening each roofing shingle to the roof deck comprises placing a fastener through the first shingle layer and the second shingle layer, and into the roof deck.

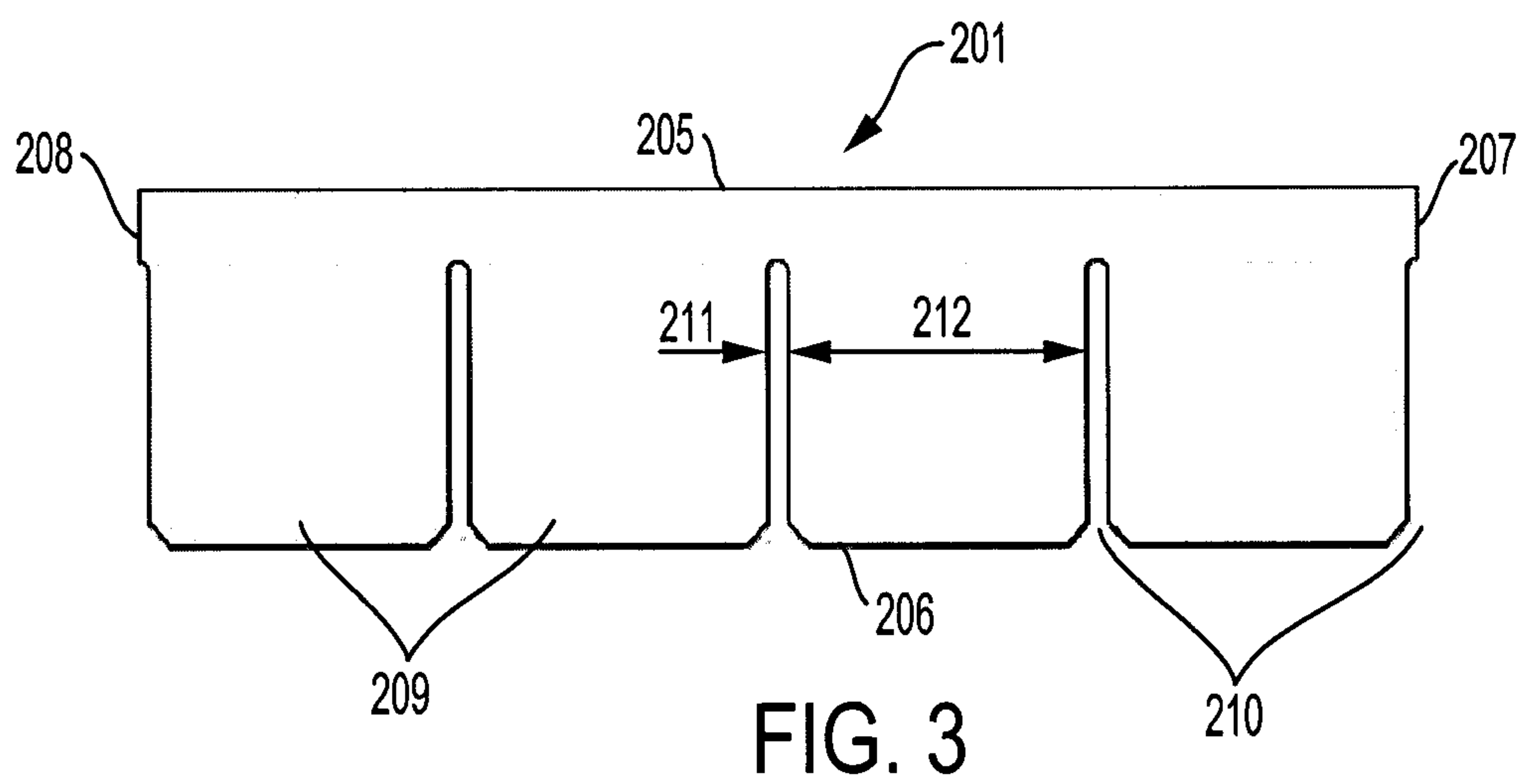
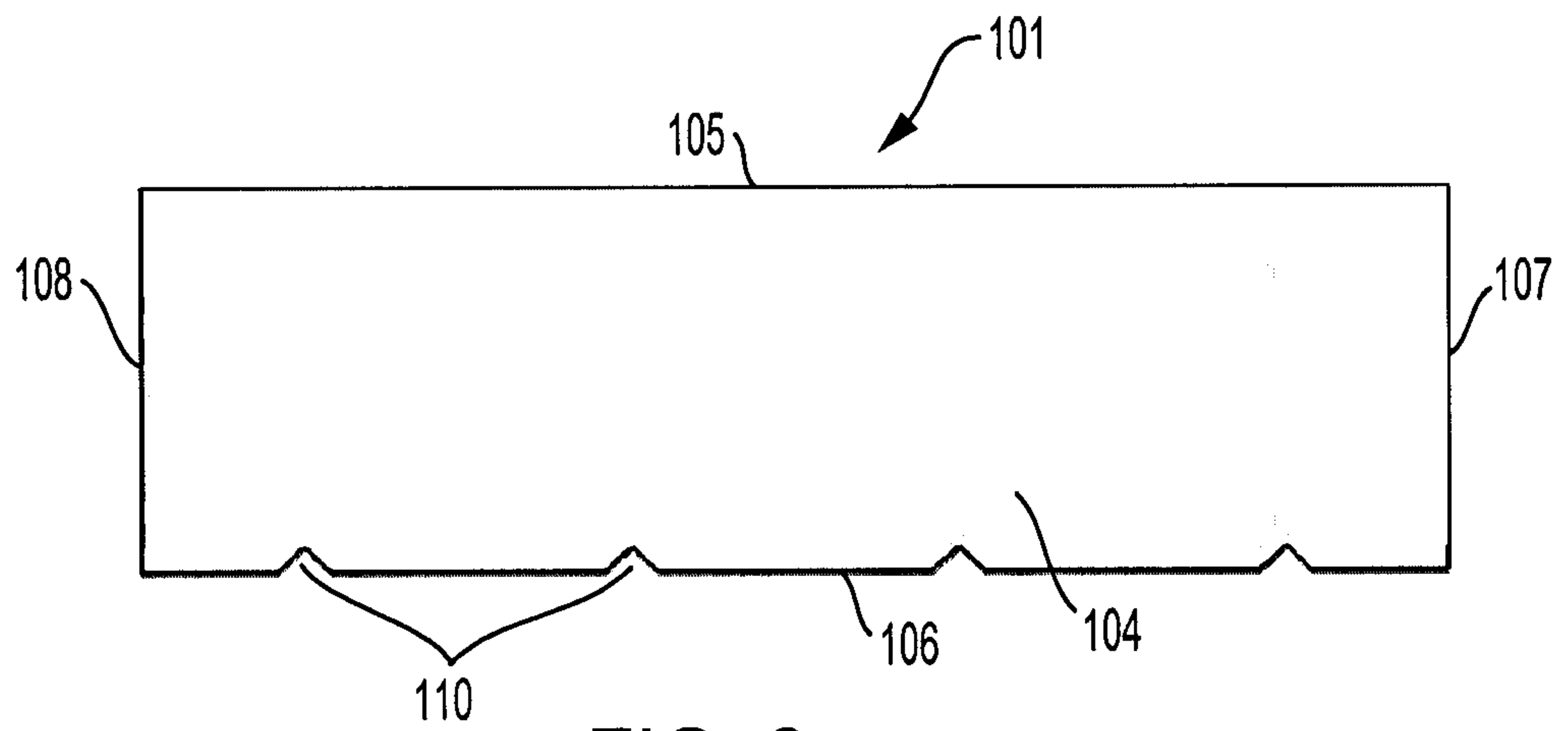
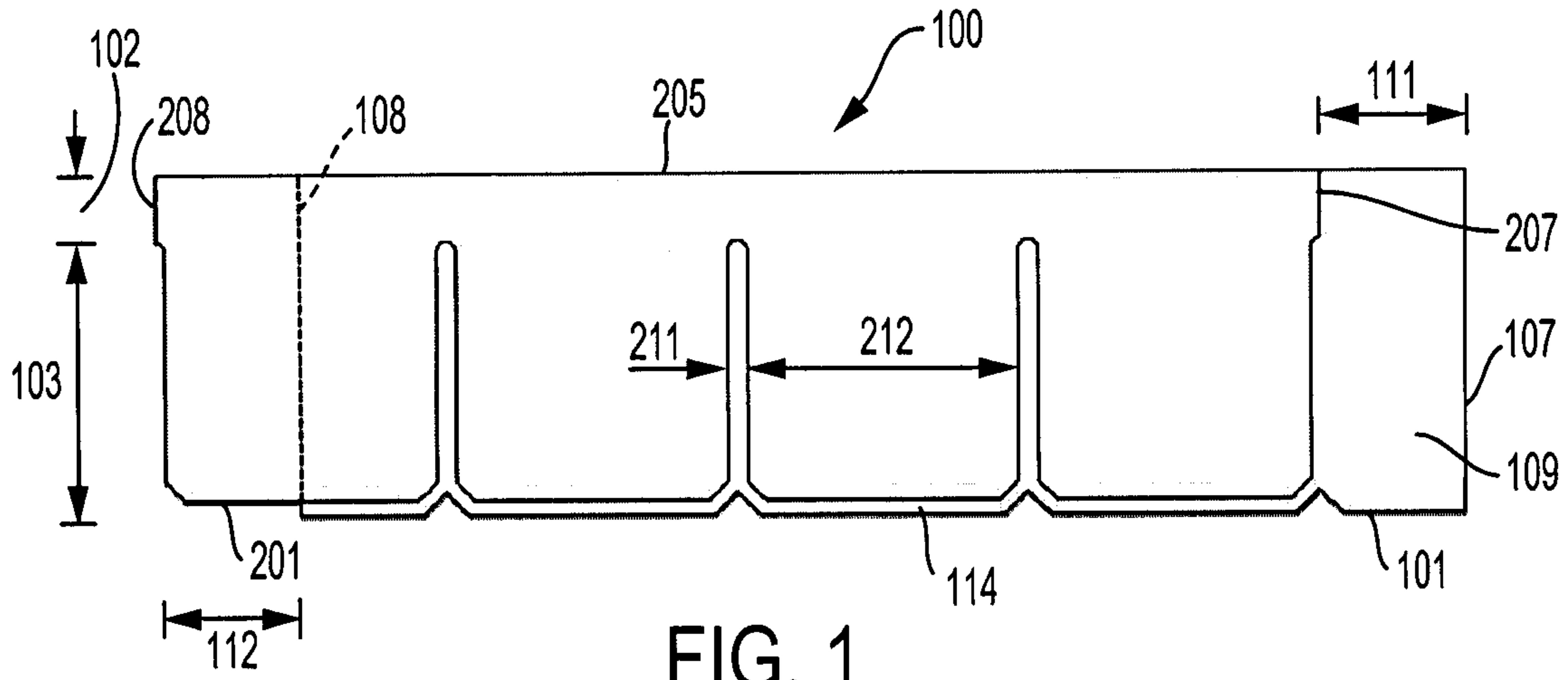
33. A method for making a roofing shingle according to any of claims 1-24, the method comprising:

positioning a second shingle layer in contact with a top surface of a first shingle layer, wherein a first side edge of the second shingle layer is offset a first sidelap distance from a first side edge of the first shingle layer such that a side portion of the top surface of the first shingle layer is exposed, and wherein a second side edge of the second shingle layer extends beyond a second side edge of the first shingle layer so as to overlap the second side edge of the first shingle layer by a second sidelap distance; and

at least partially laminating the second shingle layer to the top surface of the first shingle layer.

34. The method of claim 33 further comprising:

before positioning the second shingle layer in contact with the top surface of the first shingle layer, applying a laminating adhesive to the top surface of the first shingle layer.



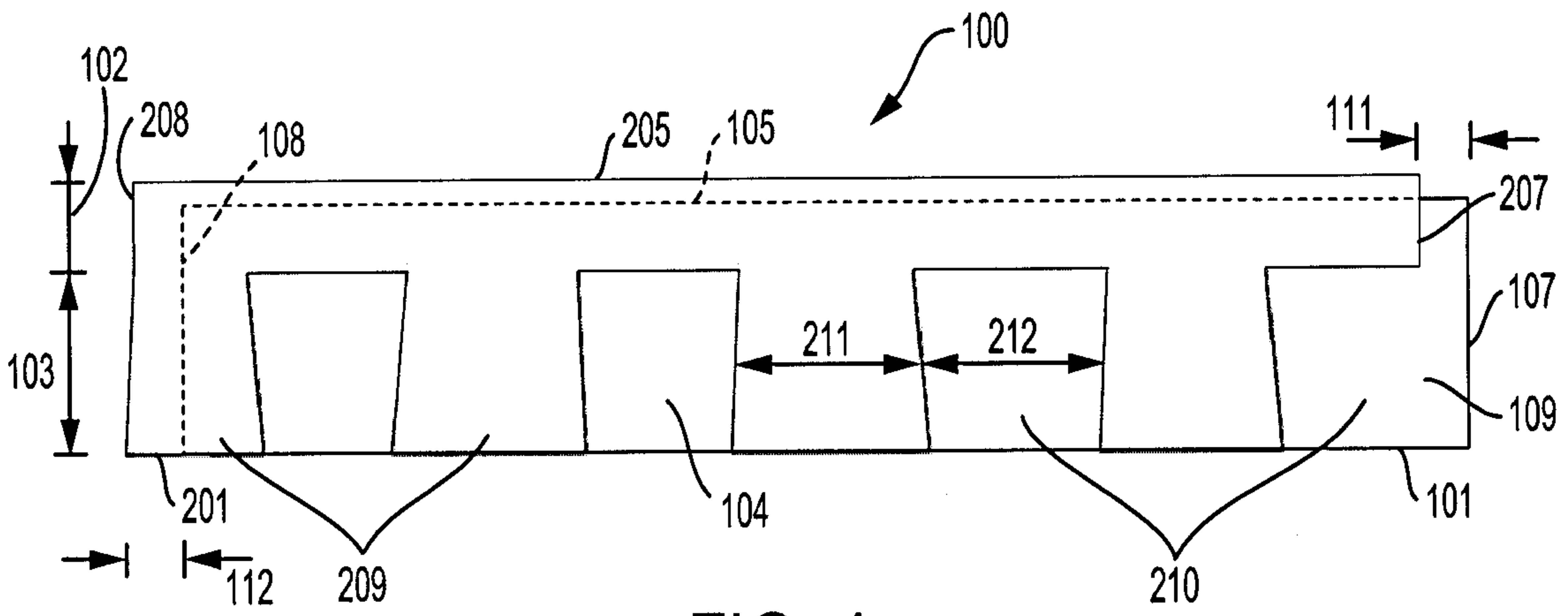


FIG. 4

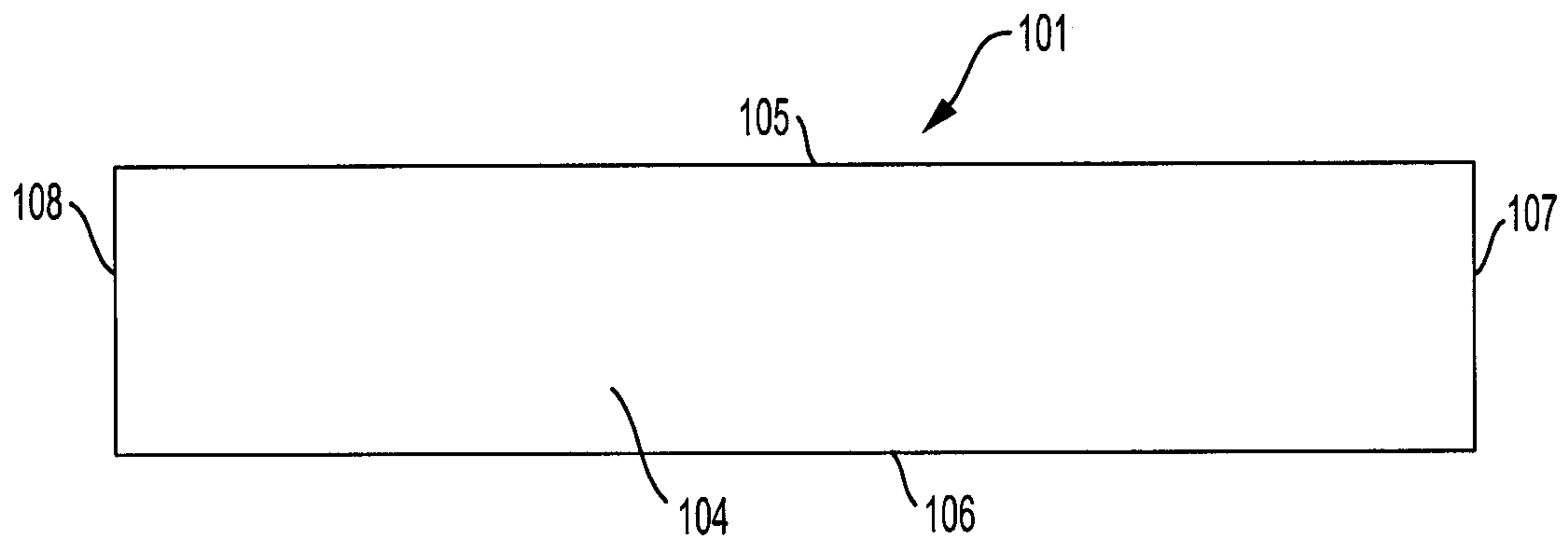


FIG. 5

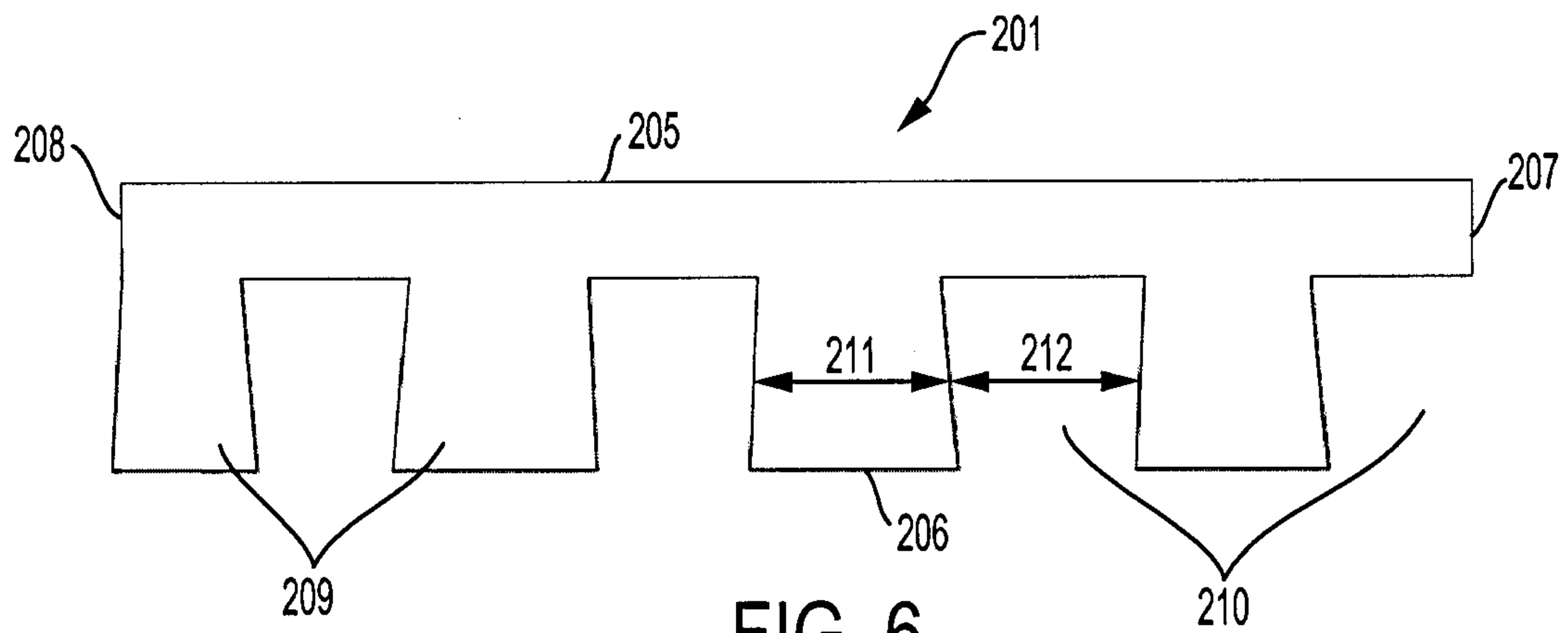


FIG. 6

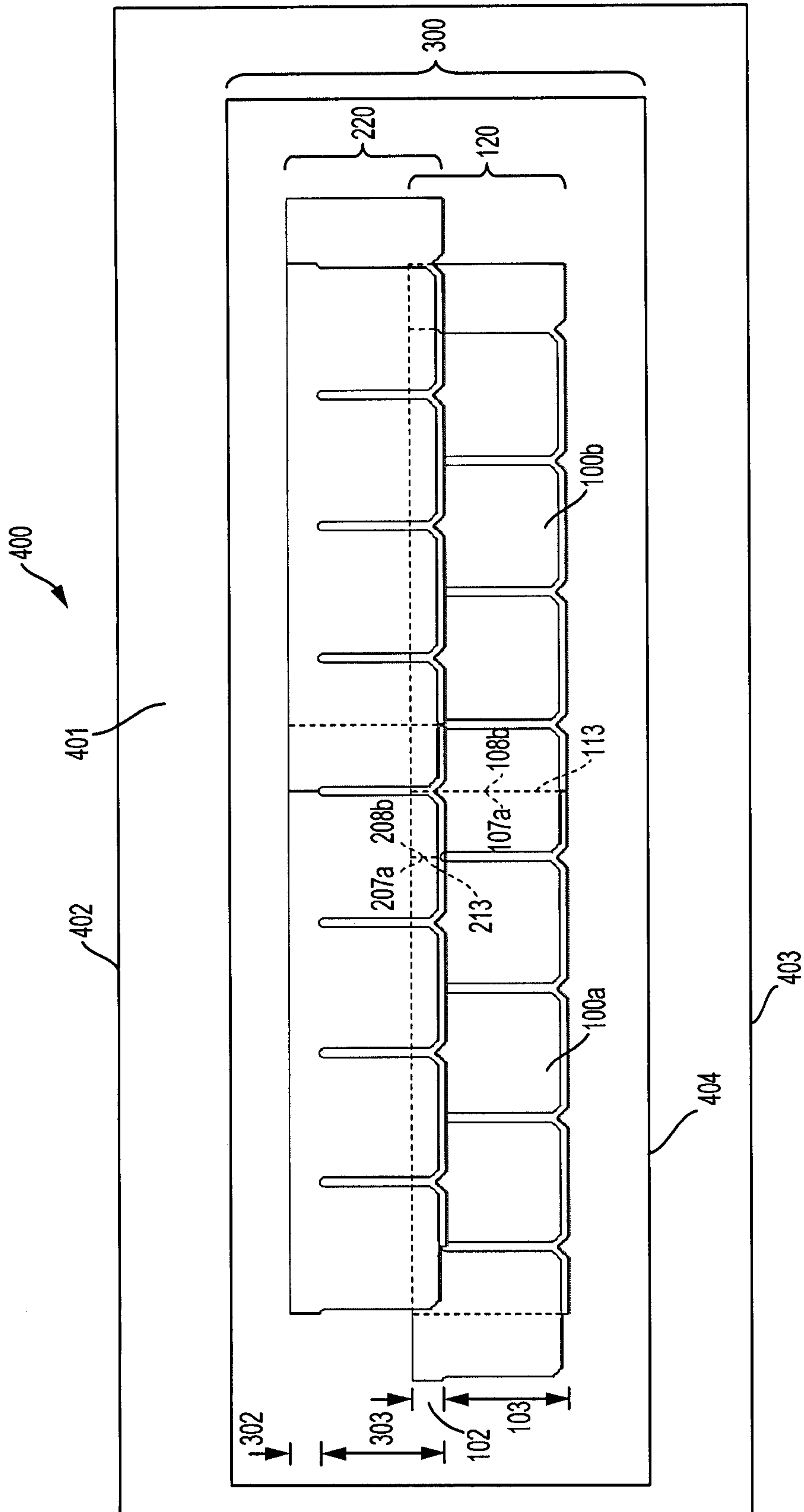


FIG. 7

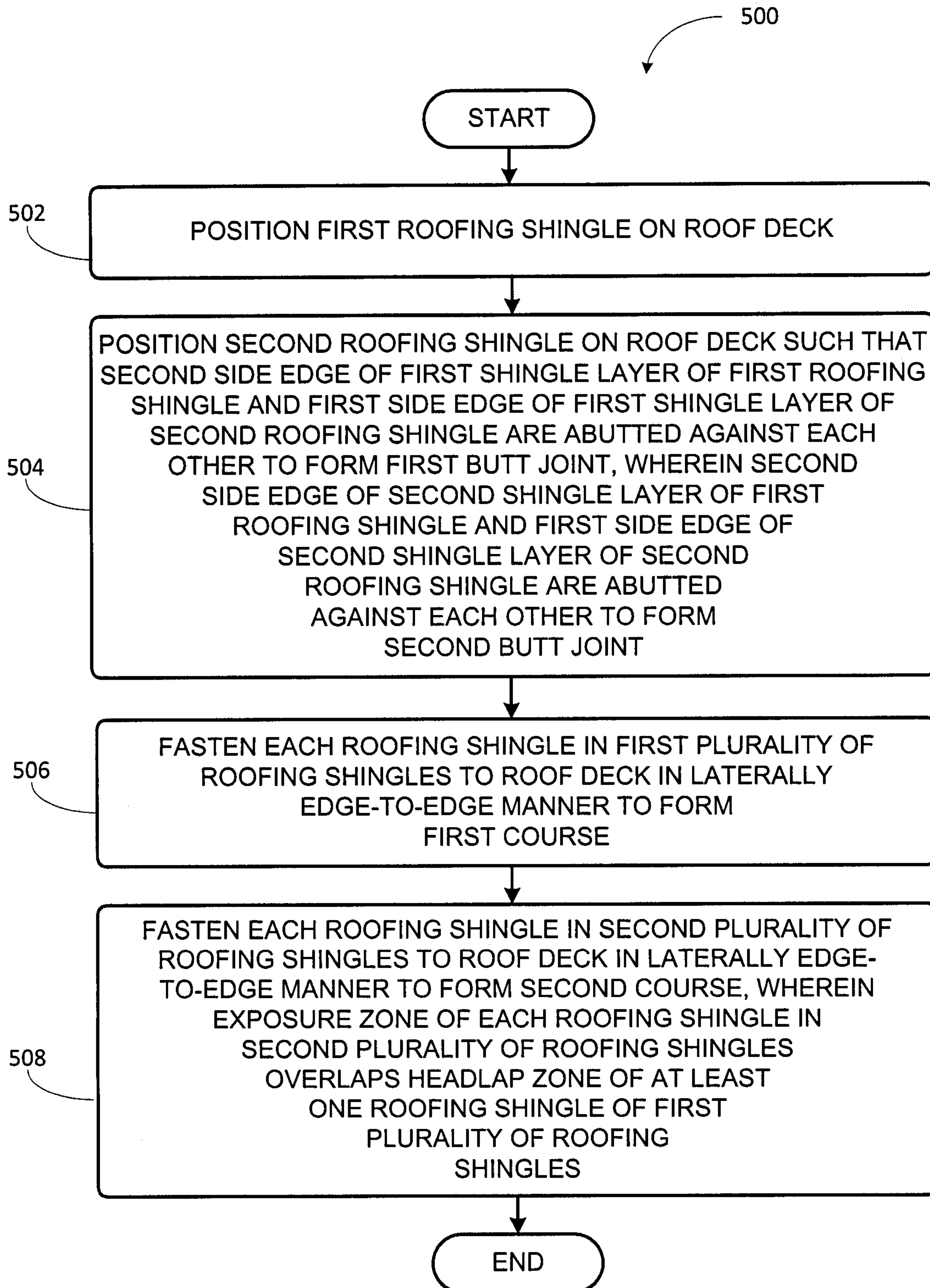


FIG. 9

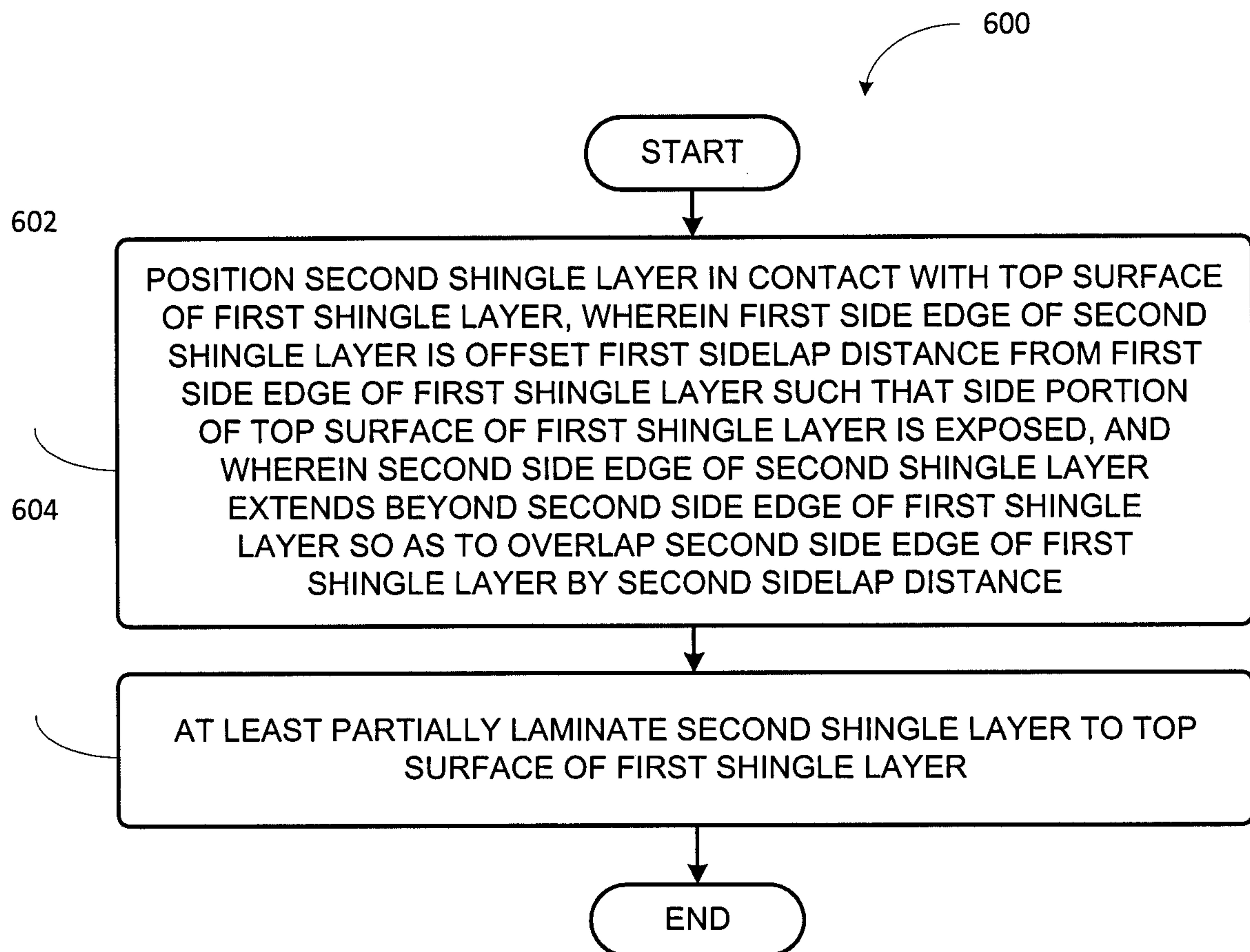


FIG. 10

