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(54) **GOLF CLUB HEADS WITH ONE OR MORE INDENTED INSERTS AND METHODS TO MANUFACTURE GOLF CLUB HEADS**

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Publication Classification

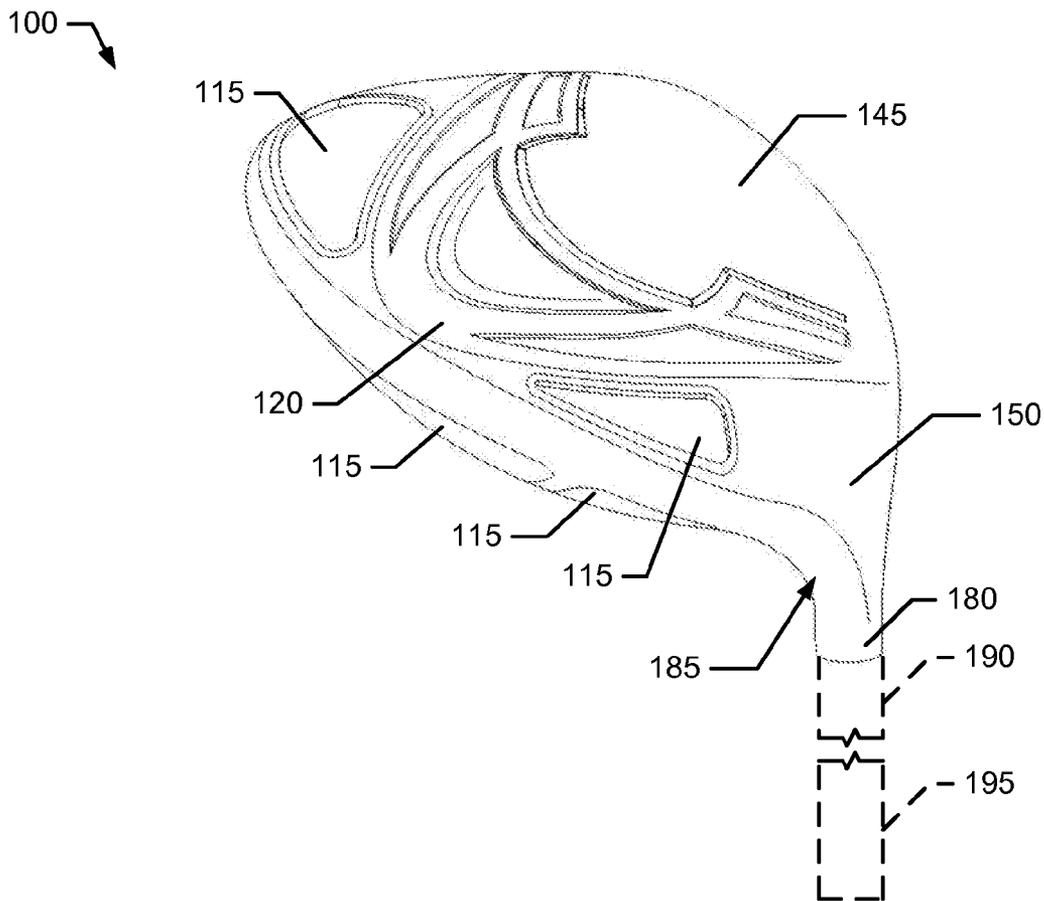
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(52) **U.S. Cl.** **473/329; 473/282; 473/342**

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(57) **ABSTRACT**
Embodiments of golf club heads with one or more indented inserts and methods to manufacture golf club heads are generally described herein. Other embodiments may be described and claimed.

(21) Appl. No.: **11/960,532**



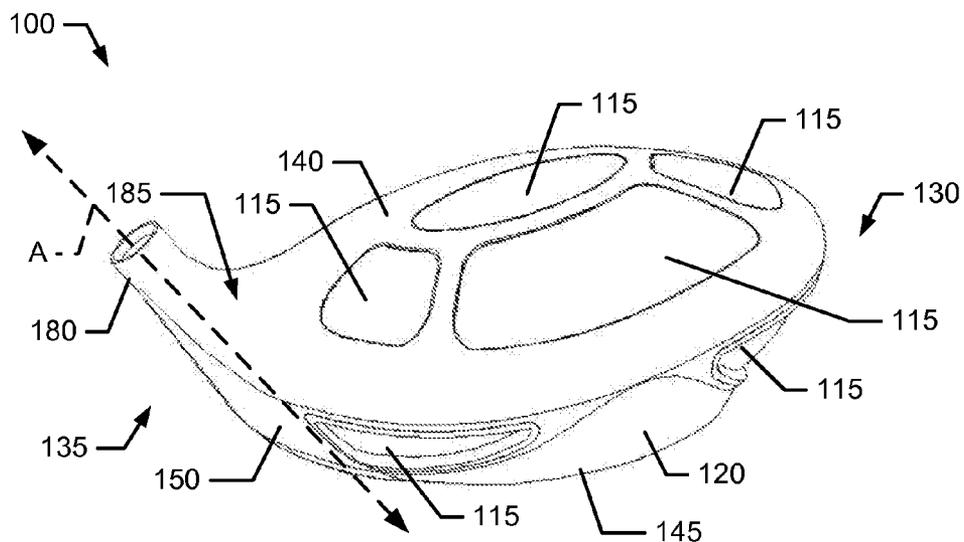


FIG. 1

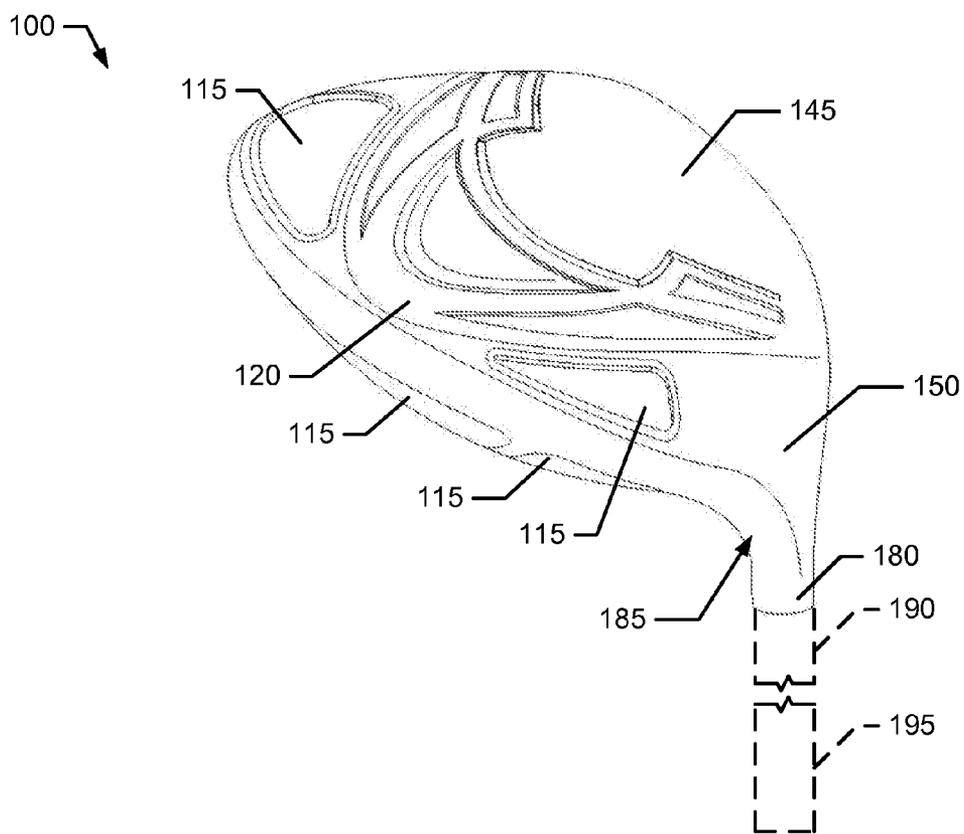


FIG. 2

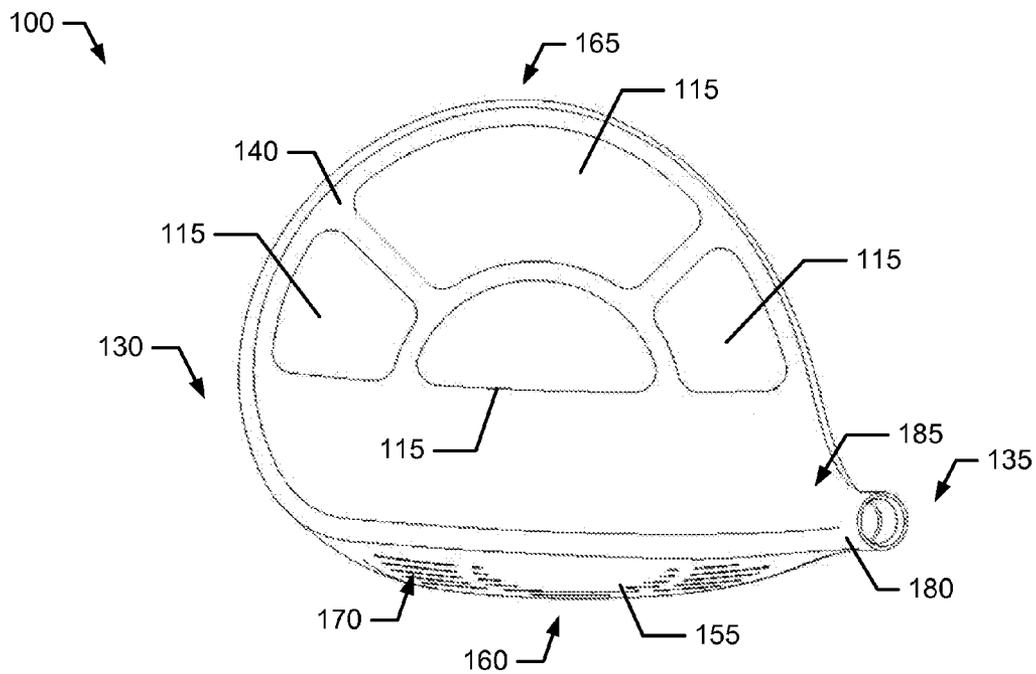


FIG. 3

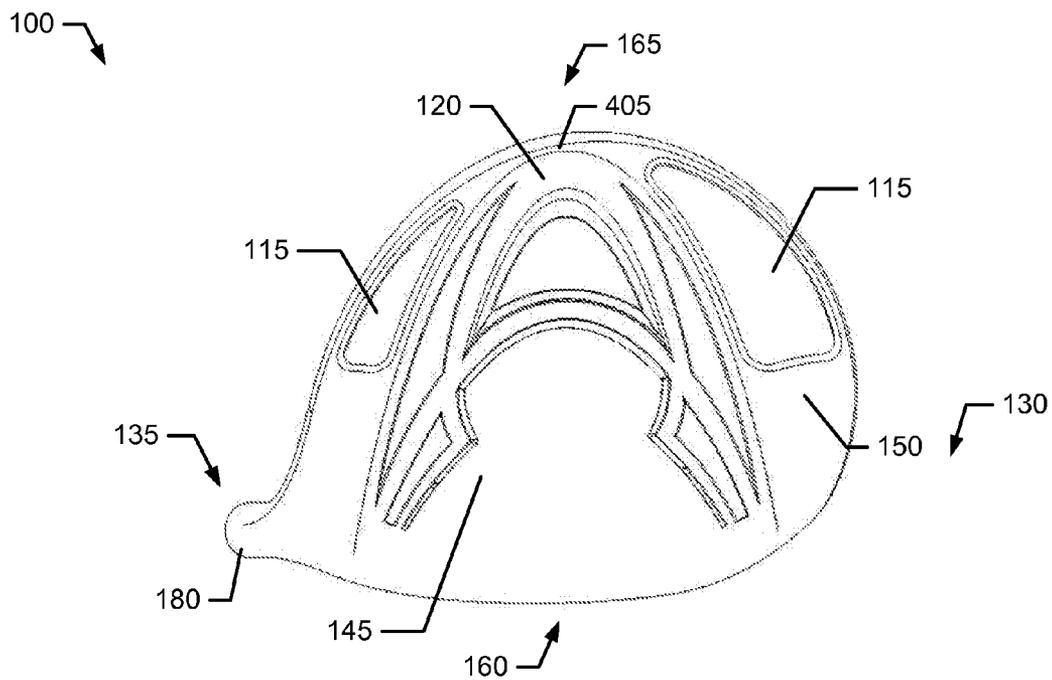


FIG. 4

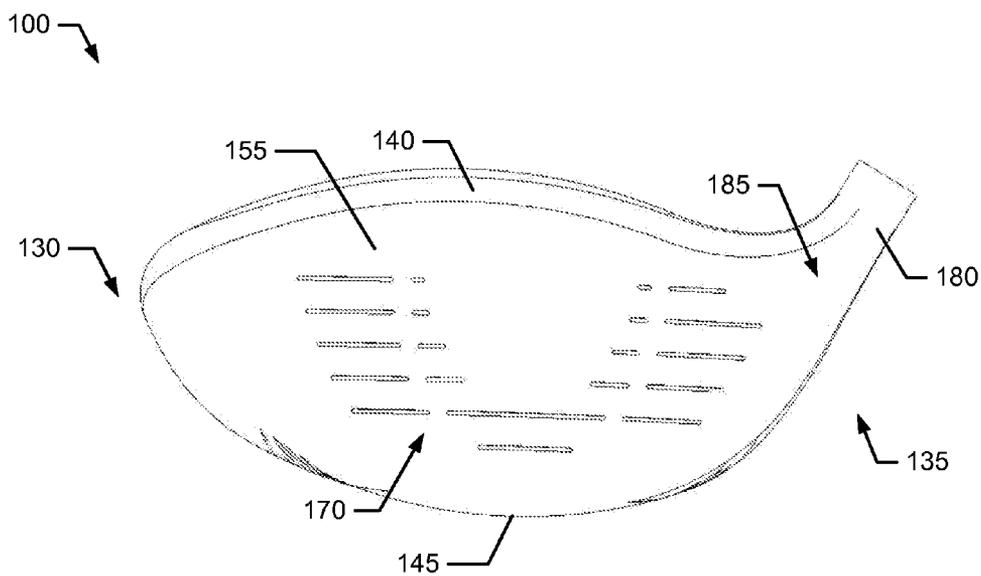


FIG. 5

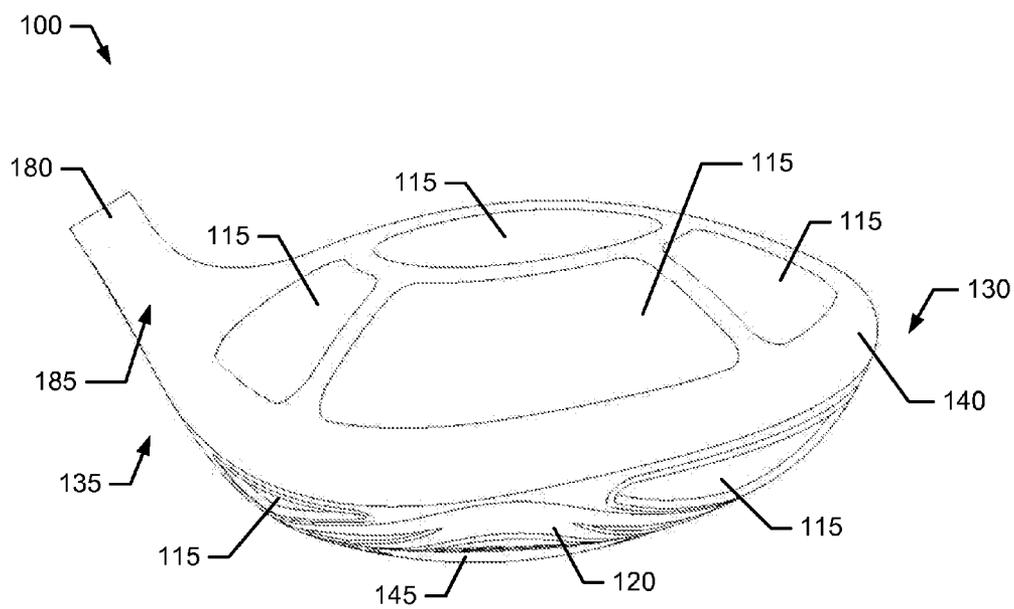


FIG. 6

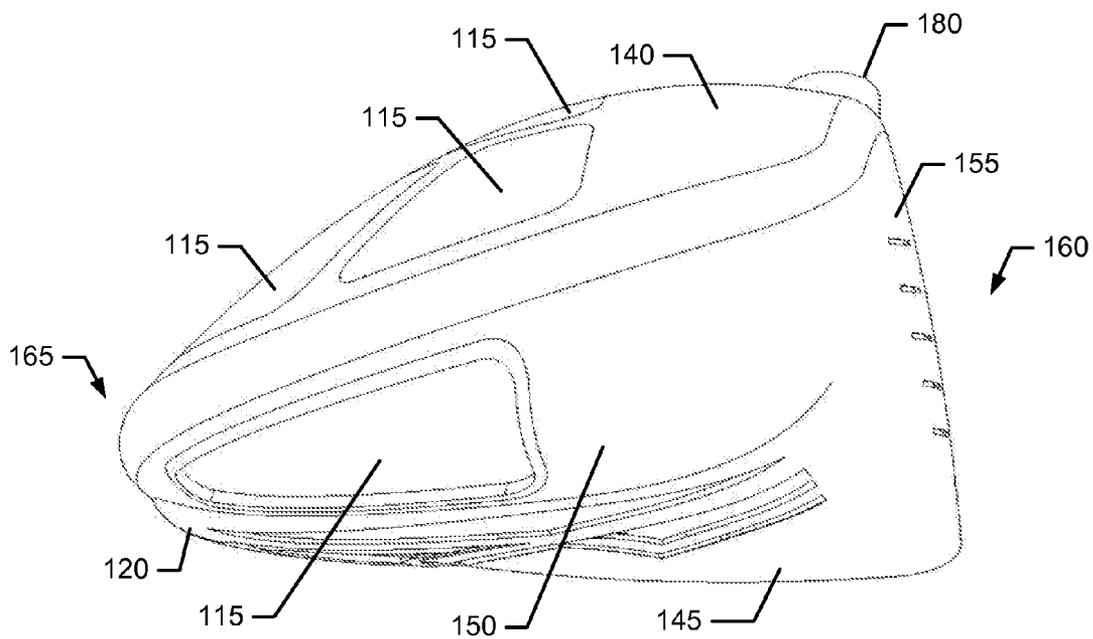


FIG. 7

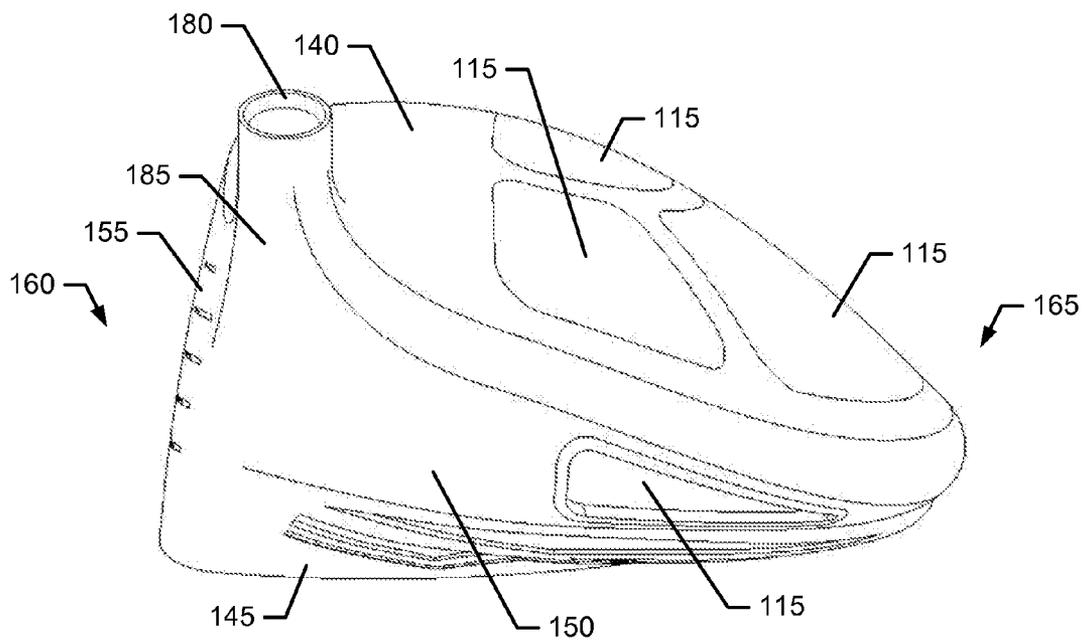


FIG. 8

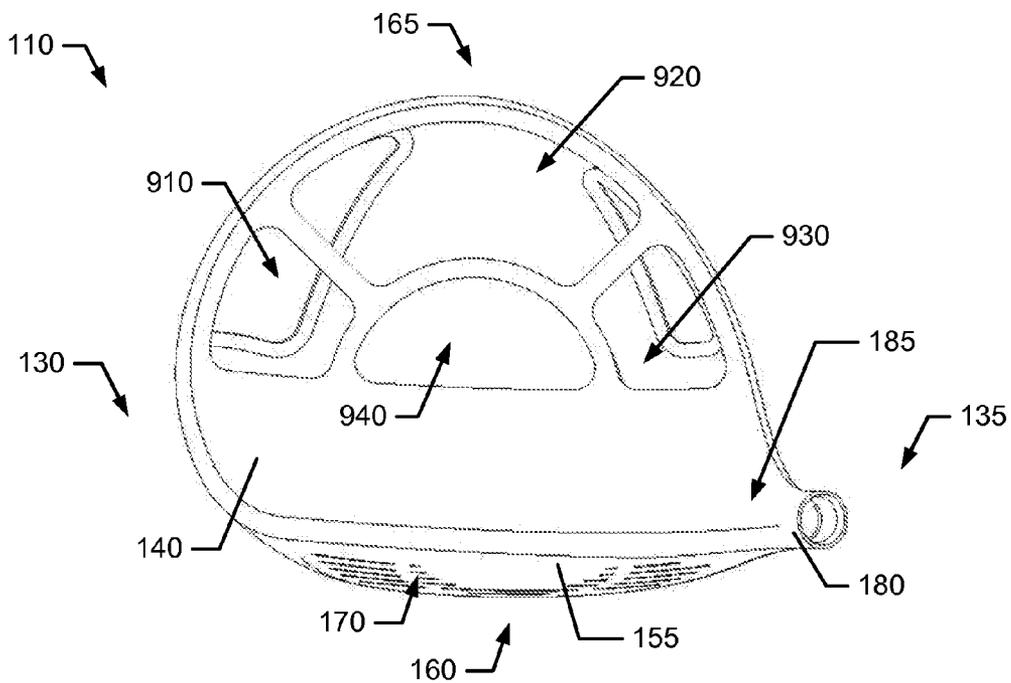


FIG. 9

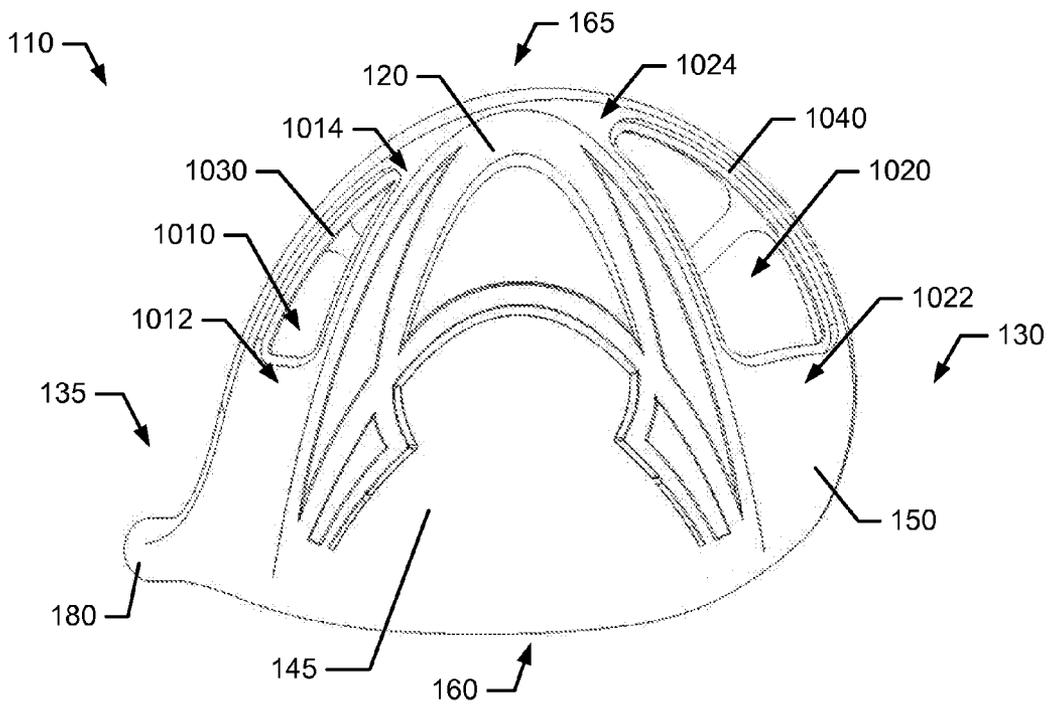


FIG. 10

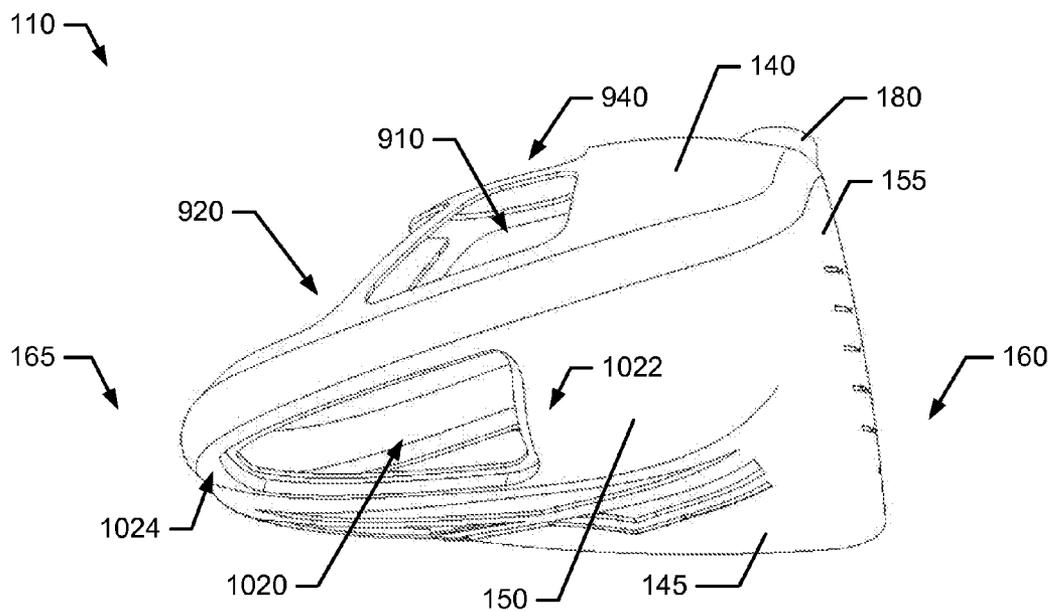


FIG. 11

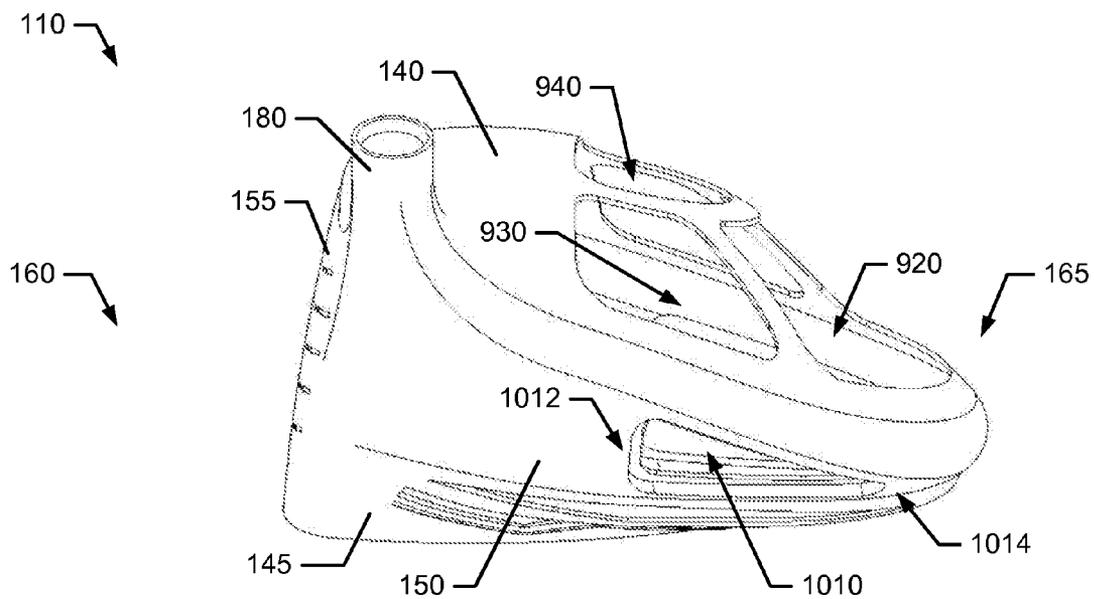


FIG. 12

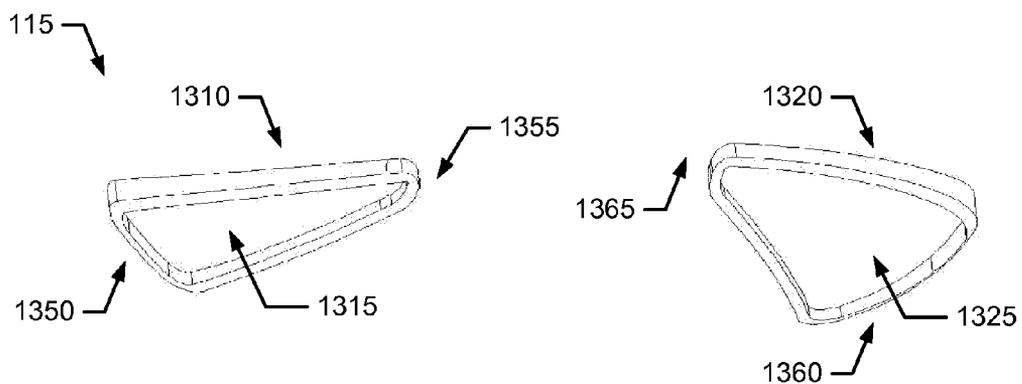


FIG. 13

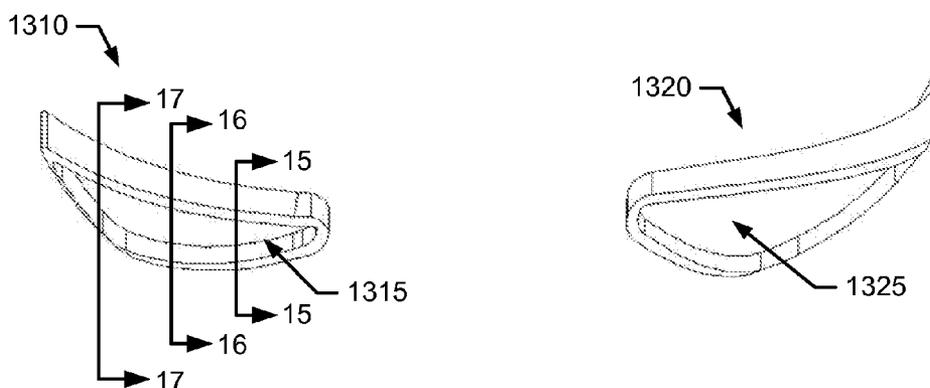


FIG. 14

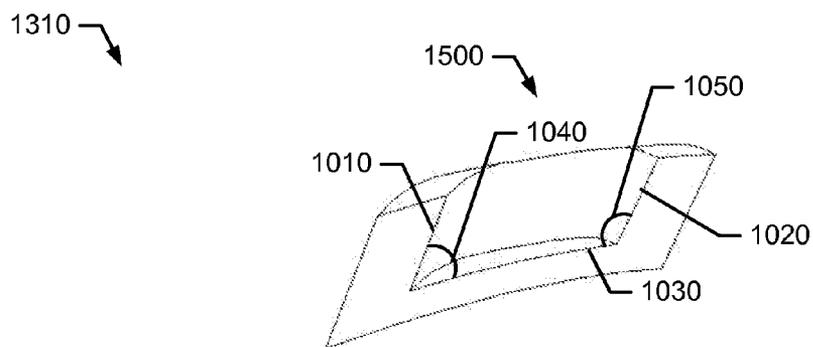


FIG. 15

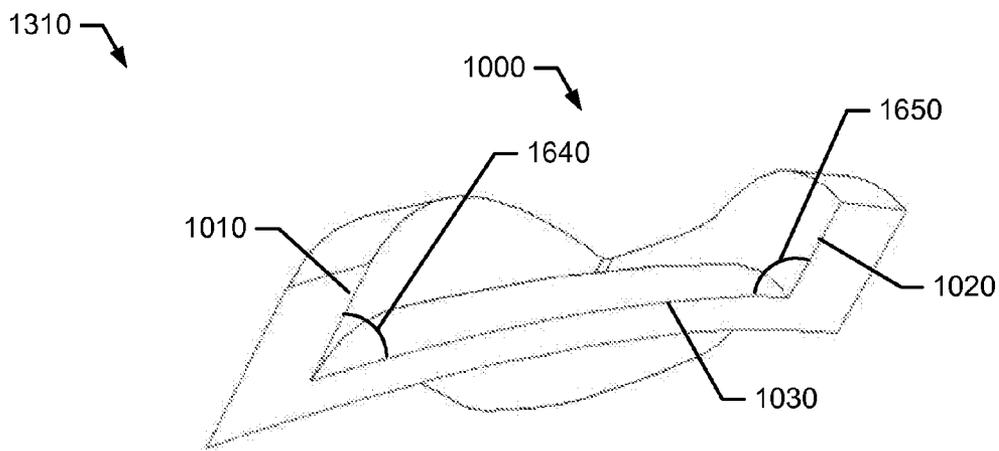


FIG. 16

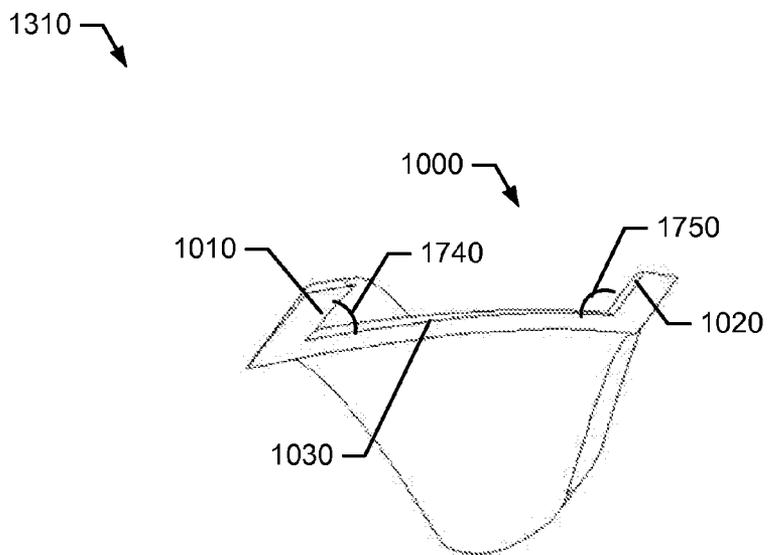


FIG. 17

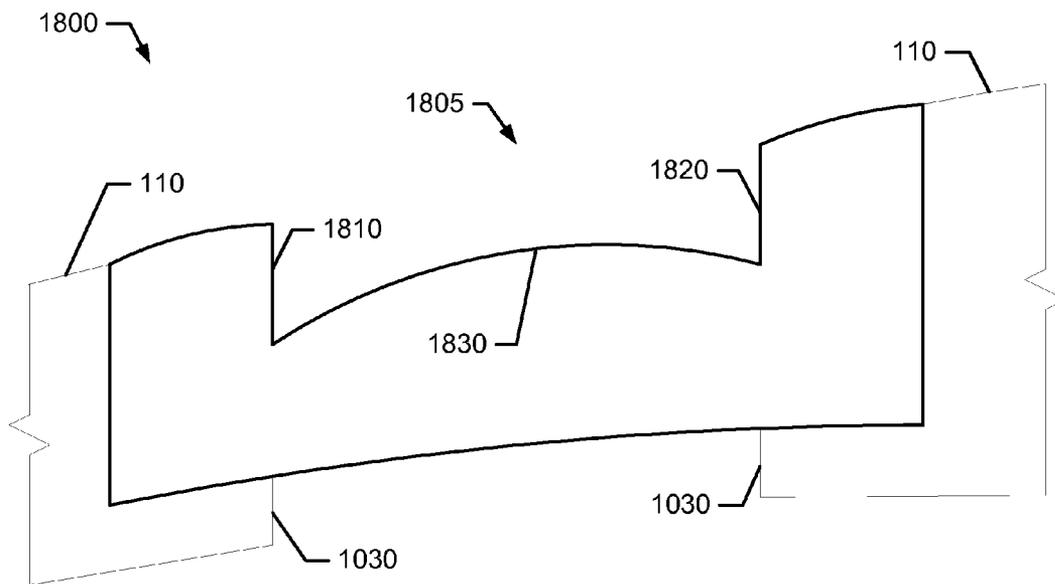


FIG. 18

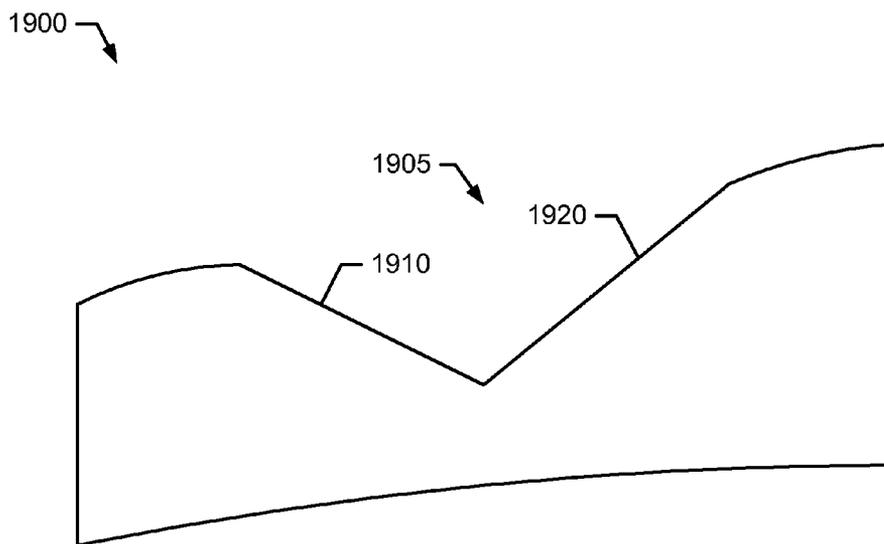


FIG. 19

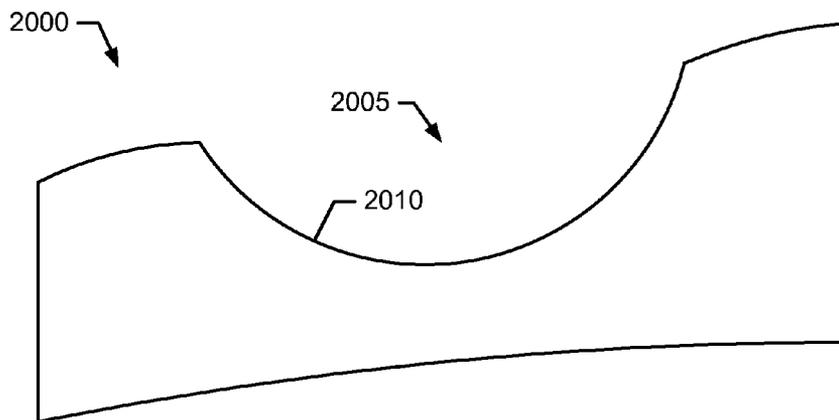


FIG. 20

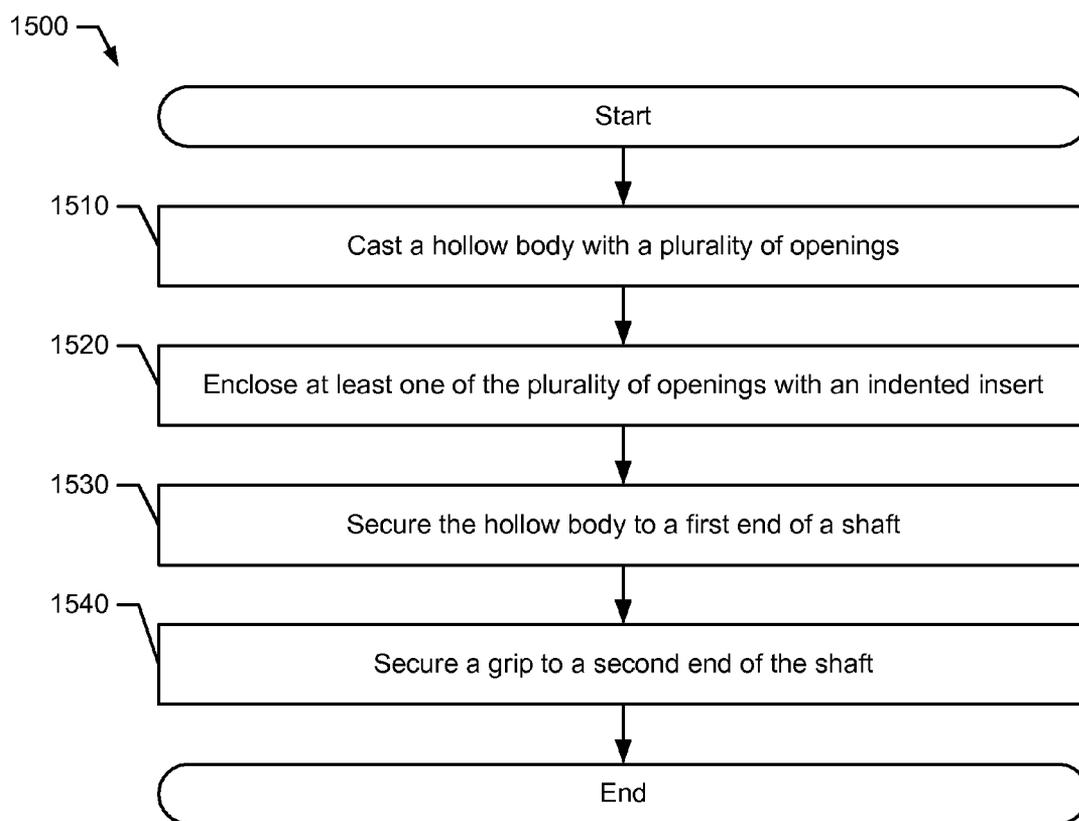


FIG. 21

GOLF CLUB HEADS WITH ONE OR MORE INDENTED INSERTS AND METHODS TO MANUFACTURE GOLF CLUB HEADS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application 60/884,685, filed Jan. 12, 2007.

TECHNICAL FIELD

[0002] The present disclosure relates generally to golf equipment, and more particularly, to golf club heads with one or more indented inserts and methods to manufacture golf club heads.

BACKGROUND

[0003] The moment of inertia (MOI) generated by a golf club head during a golf swing may affect the performance of an individual using the golf club head. For example, an increase in the MOI of the golf club head may increase resistance to twisting of the golf club head during off-center hits. As a result, increasing the MOI of golf club heads may provide greater forgiveness for off-center hits. To increase the MOI of golf club heads, the size of golf club heads (e.g., volume and/or dimension) may be increased. However, the size of golf club heads may be limited by golf standard organizations and/or governing bodies such as the United States Golf Association (USGA) and the Royal and Ancient Golf Club of St. Andrews (R&A). In accordance with the Rules of Golf established by the USGA and R&A, for example, the volume of a golf club head for a wood-type club may be limited to approximately 460 cubic centimeters (cc) or 28.06 cubic inches (cu. in.) with a tolerance of 10 cc or 0.61 cu. in., respectively. The volume of golf club heads may be determined by a weighed water displacement method (e.g., Archimedes Principle).

BRIEF DESCRIPTION OF THE DRAWINGS

- [0004] FIG. 1 is a perspective diagram representation of an example golf club head according to an embodiment of the methods, apparatus, and articles of manufacture described herein.
- [0005] FIG. 2 depicts a bottom perspective view of the example golf club head of FIG. 1.
- [0006] FIG. 3 depicts a top view of the example golf club head of FIG. 1.
- [0007] FIG. 4 depicts a bottom view of the example golf club head of FIG. 1.
- [0008] FIG. 5 depicts a front view of the example golf club head of FIG. 1.
- [0009] FIG. 6 depicts a back view of the example golf club head of FIG. 1.
- [0010] FIG. 7 depicts a heel end view of the example golf club head of FIG. 1.
- [0011] FIG. 8 depicts a toe end view of the example golf club head of FIG. 1.
- [0012] FIG. 9 depicts a top view of an example hollow body associated with the example golf club head of FIG. 1.
- [0013] FIG. 10 depicts a bottom view of the example hollow body of FIG. 9.
- [0014] FIG. 11 depicts a heel end view of the example hollow body of FIG. 9.

- [0015] FIG. 12 depicts a toe end view of the example hollow body of FIG. 9.
- [0016] FIG. 13 depicts a perspective view of example indented inserts associated with the example golf club head of FIG. 1.
- [0017] FIG. 14 depicts a top view of the example indented inserts of FIG. 13.
- [0018] FIG. 15 depicts a cross sectional view of one portion of an example indented insert of FIG. 14.
- [0019] FIG. 16 depicts a cross sectional view of another portion of the example indented insert of FIG. 14.
- [0020] FIG. 17 depicts a cross sectional view of yet another portion of the example indented insert of FIG. 14.
- [0021] FIG. 18 depicts a cross sectional view of another example indented insert.
- [0022] FIG. 19 depicts a cross sectional view of another example indented insert.
- [0023] FIG. 20 depicts a cross sectional view of another example indented insert.
- [0024] FIG. 21 is a flow diagram representation of one manner in which the example golf club head of FIG. 1 may be manufactured.

DESCRIPTION

- [0025] In general, methods, apparatus, and articles of manufacture associated with golf club heads with one or more indented inserts are described herein. The methods, apparatus, and articles of manufacture described herein are not limited in this regard.
- [0026] In the examples of FIGS. 1-17, a golf club head 100 may include a hollow body 110 and a plurality of inserts, generally shown as 115. In general, the hollow body 110 may include one or more weight portions 120, a toe end 130, a heel end 135, a crown 140 (e.g., a top wall portion), a sole 145 (e.g., a bottom wall portion), a skirt 150 (e.g., a side wall portion), a surface 155, a front end 160, and a back end 165. The hollow body 110 may be made of a metal material such as titanium, titanium alloy, and/or any other suitable materials. The methods, apparatus, and articles of manufacture are not limited in this regard.
- [0027] Instead of inserting one or more discretionary weight pads within the hollow body 110, the weight portion (s) 120 may be used to optimize the center of gravity of the golf club head 100. The weight portion(s) 120 may be located on an exterior surface of the hollow body 110 as an integral portion (e.g., the hollow body 110 may be formed by a casting process to include the weight portion(s) 120) to provide optimal structural integrity to the sole 145. In one example, the weight portion(s) 120 may be located on or proximate to the sole 145 and/or the skirt 150.
- [0028] Referring to FIG. 4, for example, the weight portion (s) 120 may have a bell-shaped contour, a U-shaped contour, a parabolic contour, and/or any other suitable contours. The weight portion(s) 120 may be configured to provide suitable acoustical and/or vibrational feedbacks to an individual when the individual hits golf balls with the golf club head 100. In particular, the weight portion(s) 120 may curve in a convex manner relative to the back end 165 (e.g., curve in a direction towards the back end 165). The weight portion(s) 120 may include a distal point 405, which may be a point furthest away from the surface 155. For example, the distal point 405 may be aligned with an optimal point of impact (not shown) on the surface 155. The optimal point of impact may be an area on the surface 155 where an individual may effectively hit a ball.

In one example, the optimal point of impact may be located at or proximate to the center of the surface **155**. In another example, the optimal point of impact may be an area on the surface **155** located closer to the toe end **130** than the heel end **135** or vice versa.

[0029] The skirt **150** may be located between the crown **140** and the sole **145** and wrap around the back end **165** of the golf club head **100** between the toe end **130** to the heel end **135**. The surface **155** may be located at the front end **160** of the hollow body **110** and configured to impact a golf ball. In particular, the surface **155** may include a plurality of grooves **170**. The plurality of grooves **170** may be elongated in a direction between the toe end **130** and the heel end **135** on the surface **155**.

[0030] Further, the hollow body **110** may include a hosel **180** and a hosel transition **185**. For example, the hosel **180** may be located at or proximate to the heel end **135**. The hosel **180** may extend from the hollow body **110** via the hosel transition **185**. To form a golf club, the hosel **180** may receive a first end of a shaft **190** (FIG. 2). The shaft **190** may be secured to the golf club head **100** by an adhesive bonding process (e.g., epoxy) and/or other suitable bonding processes (e.g., mechanical bonding, soldering, welding, and/or brazing). Further, a grip **195** may be secured to a second end of the shaft **190** to complete the golf club.

[0031] Although the above examples describe various portions and/or surfaces of the golf club head **100**, the golf club head **100** may not include certain portions and/or surfaces. For example, although FIGS. 1-17 may depict the crown **140**, the sole **145**, and the skirt **150** as separate surfaces, the skirt **150** may merge with either the crown **140** or the sole **145** into a single surface of the hollow body **110** (e.g., the hollow body **110** may include the crown **140** and the sole **145** but not the skirt **150**). In one example, the sole **145** and the skirt **150** may merge into a single bottom surface of the golf club head **100**. Further, although FIGS. 1-17 may depict the hosel **180** and the hosel transition **185**, the golf club head **100** may not include the hosel **180** and/or the hosel transition **185**. In one example, the golf club head **100** may include a bore (not shown) within the hollow body **110** to receive a shaft (e.g., an opening of the bore may be flushed with the crown **140**).

[0032] The hollow body **110** may also include one or more openings located on or proximate to the crown **140**, the sole **145**, and/or the skirt **150** of the hollow body **110**. The openings may be configured in a pattern to provide optimal acoustical and/or vibrational feedbacks at impact. The pattern of openings may also improve structural integrity and/or durability of the golf club head **100**. In the example of FIGS. 9-12, the hollow body **110** may include opening(s), generally shown as **910**, **920**, **930**, and **940**, located on or proximate to the crown **140**. For example, the openings **910**, **920**, **930**, and **940** may form a pattern extending substantially between the toe end **130** and the heel end **135**.

[0033] The hollow body **110** may also opening(s), generally shown as **1010** and **1020**, located on or proximate to the sole **145** and/or the skirt **150**. For example, the openings **1010** and **1020** may be located adjacent to the weight portion(s) **120**. While FIGS. 9-12 may depict particular sizes and shapes of the openings **910**, **920**, **930**, **940**, **1010**, and **1020**, the openings **910**, **920**, **930**, **940**, **1010**, and/or **1020** may be configured in various sizes and/or shapes to provide optimal acoustical and/or vibrational feedbacks to an individual during impact with a ball and to improve structural integrity and durability of the golf club head **100**. Although FIGS. 1-17

may depict a particular number of openings, the hollow body **110** may include more or less openings. As described in detail below, the openings **910**, **920**, **930**, **940**, **1010**, and/or **1020** may be enclosed or covered by the plurality of inserts **115**.

[0034] While FIGS. 1-17 may depict a metal wood-type club head (e.g., drivers, fairway woods, etc.), the methods, apparatus, and articles of manufacture described herein may be readily applicable to other suitable types of golf club heads. For example, the methods, apparatus, and articles of manufacture described herein may be applicable to hybrid-type club heads or other suitable types of golf club heads. The methods, apparatus, and articles of manufacture described herein are not limited in this regard.

[0035] To form the golf club head **100**, each of the plurality of openings **910**, **920**, **930**, **940**, **1010**, and **1020** may be enclosed by one of the plurality of inserts **115**. The plurality of inserts **115** may vary in material, size, shape, thickness, and/or other suitable characteristics. In one example, the inserts used to cover the openings **910**, **920**, **930**, and **940** may be relatively thinner than the inserts used to cover the openings **1010** and **1020** (e.g., the inserts **1310** and **1320** of FIGS. 13 and 14).

[0036] In the example of FIGS. 13 and 14, each of the inserts **1310** and **1320** may include an indentation **1315** and **1325**, respectively (e.g., indented inserts). The contours associated with the indentations **1315** and **1325** may vary based on the location of the inserts **1310** and **1320**, respectively, on the hollow body **110**. In particular, each of the indentations **1315** and **1325** may have a substantially U-shaped contour. The contours associated with the indentations **1315** and **1325** may vary from one end to the other because the inserts **1310** and **1320** may vary in size and shape based on the openings **1010** and **1020**, respectively.

[0037] The insert **1310** may include a first end **1350** and a second end **1355**. The indentation **1315** may taper from the first end **1350** to the second end **1355**. As noted above, the insert **1310** may enclose the opening **1010** of the hollow body **110** (FIG. 10). In particular, the first end **1350** of the insert **1310** may engage the opening **1010** at a first end **1012**, which may be located at or proximate to the heel end **135** and/or the front end **160** of the hollow body **110** (FIG. 12). The second end **1355** of the insert **1310** may engage the opening **1010** at a second end **1014**, which may be located at or proximate to the back end **165** of the hollow body **110** (FIG. 12). Alternatively, the indentation **1315** may taper from the second end **1355** to the first end **1350** or not at all. The insert **1310** may engage and rest on a support portion **1030** of the opening **1010**. The support portion **1030** may extend continuously within the opening **1010**. Alternatively, the support portion **1030** may be two or more segments within the opening **1010**.

[0038] In a similar manner, the insert **1320** may include a first end **1360** and a second end **1365**. The indentation **1325** may taper from the first end **1360** to the second end **1365**. As noted above, the insert **1320** may enclose the opening **1020** of the hollow body **110** (FIG. 10). In particular, the first end **1360** of the insert **1320** may engage the opening **1020** at a first end **1022**, which may be located at or proximate to the toe end **130** and/or the front end **160** of the hollow body **110** (FIG. 11). The second end **1365** of the insert **1320** may engage the opening **1020** at a second end **1024**, which may be located at or proximate to the back end **165** of the hollow body **110** (FIG. 11). Alternatively, the indentation **1325** may taper from the second end **1365** to the first end **1360** or not at all. The insert **1320** may engage and rest on a support portion **1040** of

the opening 1020. The support portion 1040 may extend continuously within the opening 1020. Alternatively, the support portion 1040 may be two or more segments within the opening 1020.

[0039] Although FIGS. 13 and 14 may depict particular example inserts, the methods, apparatus, and articles of manufacture described herein may be associated with other suitable inserts. For example, the inserts 1310 and 1320 may vary in size, shape, thickness, etc. relative to each other. Alternatively, the inserts 1310 and 1320 may be the same size and/or shape. The methods, apparatus, and articles of manufacture are not limited in this regard.

[0040] Referring to FIG. 15, for example, the indentation 1500 may be formed by three surfaces, generally shown as a first side surface 1510, a second side surface 1520, and a bottom surface 1530 to form the U-shaped contour. In particular, the first side surface 1510 and the bottom surface 1530 may form an angle 1540, and the second side surface 1520 and the bottom surface 1530 may form an angle 1550. The angle 1540 may be an acute angle whereas the angle 1550 may be an obtuse angle. In another example, the angle 1540 may be an obtuse angle whereas the angle 1550 may be an acute angle. Alternatively, the angles 1540 and 1550 may be same (e.g., 90-degrees angle). Turning to FIG. 16, the first side surface 1510 and the bottom surface 1530 may form an acute angle 1640, and the second side surface 1020 and the bottom surface 1030 may form an obtuse angle 1650. In the example of FIG. 17, the first side surface 1010 and the bottom surface 1030 may form an acute angle 1740, and the second side surface 1020 and the bottom surface 1030 may form an obtuse angle 1750. The acute angles 1540, 1640, and/or 1740 may be the same or different. In one example, the acute angle 1540 may be less than or equal to the acute angle 1640, which in turn, may be less than or equal to the acute angle 1740. In a similar manner, the obtuse angle 1550 may be less than or equal to the obtuse angle 1650, which in turn, may be less than or equal to the obtuse angle 1750. Although the above examples may describe particular angles, the surfaces associated with the indentations 1315 and 1325 may form other suitable angles based on corresponding contours.

[0041] Referring to FIG. 18, for example, an insert 1800 may be associated with an indentation 1805. The indentation 1805 may be formed by three surfaces, generally shown as a first side surface 1810, a second side surface 1820, and a bottom surface 1830 to form the U-shaped contour. In particular, the bottom surface 1830 may curve in a convex manner relative to the indentation 1805. The methods, apparatus, and articles of manufacture are not limited in this regard.

[0042] Alternatively, each of the indentations 1315 and 1325 may have a V-shaped contour, a parabolic contour and/or any other suitable contours. Turning to FIG. 19, for example, the indentation 1900 may have a substantially V-shaped contour. In particular, the indentation 1300 may be formed by two surfaces, generally shown as a first side surface 1910 and a second side surface 1920, to form the V-shaped contour. In the example of FIG. 20, the indentation 2000 may have a substantially parabolic contour. Accordingly, the indentation 2000 may be formed by a single surface 2010 to form the parabolic contour. The methods, apparatus, and articles of manufacture are not limited in this regard.

[0043] Referring back to FIGS. 13 and 14, each of the indented inserts 1310 and 1320 may be configured to enclose or cover a corresponding opening of the hollow body 110. In one example, the indented insert 1310 may be configured to

enclose the opening 1010 of the hollow body 110 (FIG. 10) whereas the indented insert 1320 may be configured to enclose the opening 1020 of the hollow body 110 (FIG. 10). The indented inserts 1310 and 1320 may be made of a relatively light-weight material such as an acrylonitrile butadiene styrene (ABS) material, a thermoplastic material, a composite material (e.g., carbon-fiber reinforced plastic), and/or any other suitable materials. The indented inserts 1310 and 1320 may be bonded to the hollow body 110 as described in detail below.

[0044] As noted above, the MOI generated by the golf club head 100 may affect the performance of an individual. In one example, an increase in the MOI of the golf club head may increase resistance to twisting of the golf club head along the longitudinal axis A (FIG. 1) of the hosel 180 and/or other axes during off-center hits. As a result, increasing the MOI of golf club heads may provide greater forgiveness (e.g., long, straight shots) for off-center hits. To increase the MOI of golf club heads, the size of golf club heads (e.g., volume and/or dimension) may be increased. However, the size of golf club heads may be limited by golf standard organizations and/or governing bodies such as the USGA and the R&A. For example, the volume of a golf club head for a wood-type club may be limited to approximately 460 cc with a tolerance of 10 cc (e.g., a range from 450 cc to 470 cc).

[0045] As noted above, the volume of a club head may be determined by using a weighted water displacement method (e.g., Archimedes Principle). The buoyant force on a submerged object is equal to the weight of the fluid that is displaced by the object. In particular, one cubic centimeter (1 cc) of water has a mass of one gram (1 g) because water has a specific gravity of 1.0. By using one or more inserts with an indentation or a concavity (e.g., the indented inserts 1310 and 1320 of FIGS. 13 and 14) to enclose or cover the openings 1010 and 1020, the size of the hollow body 110 may be increased (which in turn, may increase the MOI of the golf club head 100) without increasing the volume of the golf club head 100 according to the weighed water displacement method. The indentations 1315 and 1325 of the indented inserts 1310 and 1320, respectively, may reduce the amount of water displaced by the golf club head 100. For example, the indentations 1315 and 1325 may hold two to three cubic centimeters (2-3 cc) of water with each indentation holding at least one gram (1 g) of water. As a result, the indented inserts 1310 and 1320 may compensate for an increase in dimension of the hollow body 110.

[0046] As noted above, the indented inserts 1310 and 1320 may enclose or cover the openings 1010 and 1020, respectively, of the hollow body 110 to form the golf club head 100. Accordingly, the golf club head 100 may displace less amount of water than a golf club head formed by the hollow body 110 but with the openings 1010 and 1020 enclosed by non-indented inserts. Thus, the MOI of the golf club head 100 may be increased while complying with a size limit established by a golf standard organization and/or governing body.

[0047] Although the above example may describe enclosing the openings 1010 and 1020 with indented inserts, the openings 910, 920, 930, and 940 may also be enclosed by indented inserts to further increase the size of the hollow body 110 without exceeding an established size limit on a golf club head. As noted above, the hollow body 110 may include additional openings, which may be enclosed or covered by indented inserts. Thus, the size of the hollow body 110 may be further increased without exceeding an established size limit

on a golf club head. The methods, apparatus, and articles of manufacture are not limited in this regard.

[0048] In the example of FIG. 21, a process 2100 may begin with casting the hollow body 110 (FIG. 1) to form the golf club head 100 (block 2110). As noted above, the hollow body 110 may be made of a metal material (e.g., titanium). The hollow body 110 may include one or more openings (e.g., the openings 910, 920, 930, 940, 1010, and 1020 of FIGS. 9-12).

[0049] The process 2100 may enclose at least one of the plurality of openings with an indented insert (e.g., the indented inserts 1310 and 1320 of FIGS. 13 and 14) (block 2120). As noted above, the indented inserts 1310 and 1320 (FIGS. 13 and 14) may be made of an ABS material, a thermoplastic material, a composite material, and/or other suitable relatively light-weight materials. In one example, the openings 1010 and 1020 (FIG. 10) may be enclosed by the inserts 1310 and 1320 (FIGS. 13 and 14), respectively. The openings 910, 920, 930, and 940 (FIG. 9) may be enclosed by non-indented inserts (and/or an insert sheet) with a bladder mold process. The non-indented inserts and/or the insert sheet may be made of an ABS material, a thermoplastic material, a composite material, and/or other suitable relatively light-weight materials. In particular, the non-indented inserts and/or the insert sheet may enclose or cover the openings 910, 920, 930, and 940 (FIG. 9) by being secured to the hollow body 110 from the inside of the hollow body 110 with a suitable adhesive (e.g., epoxy). A bladder may be inserted into the hollow body 110 through the openings 1010 or 1020 and inflated to assert pressure on the non-indented inserts and/or the insert sheet to bond with the hollow body 110. The bladder may be removed through the openings 1010 or 1020 after the non-indented inserts and/or the insert sheet are secured to inside of the hollow body 110 at the openings 910, 920, 930, and 940.

[0050] Instead of a bladder mold process, the openings 910, 920, 930, and the 940 may be covered from the outside of the hollow body 110 by indented or non-indented inserts with an adhesive. In another example, all of the openings 910, 920, 930, 940, 1010, and 1020 may be enclosed by indented inserts. The methods, apparatus, and articles of manufacture described herein are not limited in this regard.

[0051] To form a golf club, the hosel 180 may receive a first end of a shaft (e.g., one shown as 190 in FIG. 1). The shaft 190 and the hollow body 110 (via the hosel 180) may be secured to each other by an adhesive bonding process (e.g., epoxy) and/or other suitable bonding processes (e.g., mechanical bonding, soldering, welding, and/or brazing) (block 2130). To complete the golf club, a grip (e.g., one shown as 195 in FIG. 1) may receive a second end of the shaft 190. The shaft 190 and the grip 195 may be secured to each other by an adhesive bonding process and/or other suitable bonding processes (block 2140). The methods, apparatus, and articles of manufacture are not limited in this regard.

[0052] Although the process 2100 may be described above with respect to the golf club head 100, the process 2100 may be applicable to other golf club heads. Further, while a particular order of actions is illustrated in FIG. 21, these actions may be performed in other temporal sequences. For example, two or more actions depicted in FIG. 21 may be performed sequentially, concurrently, or simultaneously.

[0053] Although certain example methods, apparatus, and/or articles of manufacture have been described herein, the scope of coverage of this disclosure is not limited thereto. On the contrary, this disclosure covers all methods, apparatus,

and/or articles of manufacture fairly falling within the scope of the appended claims either literally or under the doctrine of equivalents.

What is claimed is:

1. A golf club head comprising;
 - a body having a heel end, a toe end, a front end, a back end, a face portion, a bottom wall portion, and a top wall portion, the body having at least one opening positioned at or proximate to at least one of the bottom wall portion or the top wall portion; and
 - an insert to enclose the at least one opening, the insert having at least one indentation.
2. A golf club head as defined in claim 1 further comprising a side wall portion, wherein the at least one opening is positioned at or proximate to the side wall portion.
3. A golf club head as defined in claim 1, wherein the at least one indentation comprises an indentation associated with at least one of a U-shaped contour or a V-shaped contour.
4. A golf club head as defined in claim 1, wherein the at least one indentation comprises a first wall extending between the front and back ends, a second wall extending between the front and back ends, and a third wall extending between the top and bottom wall portions in a convex manner relative to the indentation.
5. A golf club head as defined in claim 1, wherein the insert comprises a first end and a second end, the insert tapers from the first end to the second end.
6. A golf club head as defined in claim 1, wherein the insert comprises an insert extending and tapering from the front end to the back end of the body.
7. A golf club head as defined in claim 1, wherein the insert comprises at least one of an acrylonitrile butadiene styrene (ABS) material, a thermoplastic material, or a composite material.
8. A golf club head as defined in claim 1, wherein the golf club head is associated with a volume ranging from 450 cubic centimeters to 470 cubic centimeters.
9. A golf club head as defined in claim 1, wherein the golf club head comprises at least one of a driver-type club head, a fairway-wood type club head, or a hybrid-type club head.
10. A golf club comprising;
 - a shaft having a first end and a second end;
 - a grip coupled to the shaft at the first end;
 - a club head coupled to the shaft at the second end, the club head comprising a body having a heel end, a toe end, a front end, a back end, a face portion, a bottom wall portion, and a top wall portion, the body having at least one opening; and
 - an insert coupled to the body at the at least one opening, the insert having an indentation.
11. A golf club as defined in claim 10 further comprising a side wall portion, wherein the at least one opening is positioned at or proximate to the side wall portion.
12. A golf club as defined in claim 10, wherein the at least one indentation comprises an indentation associated with at least one of a U-shaped contour or a V-shaped contour.
13. A golf club as defined in claim 10, wherein the insert comprises a first end and a second end, and wherein the insert tapers from the first end to the second end.
14. A golf club as defined in claim 10, wherein the insert comprises an insert tapering from the front end to the back end of the body.

15. A golf club as defined in claim 10, wherein the insert comprises at least one of an acrylonitrile butadiene styrene (ABS) material, a thermoplastic material, or a composite material.

16. A golf club as defined in claim 10, wherein the golf club comprises at least one of a driver-type club, a fairway-wood type club, or a hybrid-type club.

17. A method comprising:
providing a body having a heel end, a toe end, a front end, a back end, a face portion, a bottom wall portion, and a top wall portion, the body having at least one opening positioned at or proximate to at least one of the bottom wall portion or the top wall portion; and
enclosing the at least one opening with an insert, the insert having at least one indentation.

18. A method as defined in claim 17, wherein enclosing the at least one opening with the insert comprises enclosing an opening positioned at or proximate to a side wall portion.

19. A method as defined in claim 17, wherein enclosing the at least one opening with the insert comprises enclosing the at least one opening with an insert having an indentation associated with at least one of a U-shaped contour or a V-shaped contour.

20. A method as defined in claim 17, wherein enclosing the at least one opening with the insert comprises enclosing the at least one opening with an insert tapering from a first end to a second end.

21. A method as defined in claim 17, wherein enclosing the at least one opening with the insert comprises enclosing the at least one opening with an insert tapering from the front end to the back end of the body.

22. A method as defined in claim 17, wherein enclosing the at least one opening with the insert comprises enclosing the at least one opening with an insert comprising at least one of an acrylonitrile butadiene styrene (ABS) material, a thermoplastic material, or a composite material.

23. An apparatus comprising:
a hollow body of a metal material having a plurality of openings, a heel end, a toe end, a skirt, a sole, a crown, and a surface to impact a golf ball, at least one of the skirt, the sole, or the crown having an opening associated with the plurality of openings; and
an insert coupled to the hollow body at a support portion associated with the opening, the insert having an indentation.

24. An apparatus as defined by claim 23, wherein the indentation comprises an indentation associated with at least one of a U-shaped contour or a V-shaped contour.

25. An apparatus as defined by claim 23, wherein the indentation comprises an indentation having a first wall extending between the front and back ends, a second wall extending between the front and back ends, and a third wall extending between the top and bottom wall portions in a convex manner relative to the indentation.

26. An apparatus as defined by claim 23, wherein the indentation comprises an indentation configured to hold at least one cubic centimeter of water.

27. An apparatus as defined by claim 23, wherein the insert comprises a first end and a second end, the insert tapers from the first end to the second end.

28. An apparatus as defined by claim 23, wherein the insert comprises at least one of an insert enclosing an opening located on the skirt and tapering from the heel end to the back end, or an insert enclosing an opening located on the skirt and tapering from the toe end to the back end.

29. An apparatus as defined by claim 23, wherein insert comprises at least one of an acrylonitrile butadiene styrene (ABS) material, a thermoplastic material, or a composite material.

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