



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
22.02.2023 Bulletin 2023/08

(51) International Patent Classification (IPC):
B63B 32/51 ^(2020.01) **B63B 32/64** ^(2020.01)
B63B 32/66 ^(2020.01) **B63B 32/59** ^(2020.01)

(21) Application number: **21789170.4**

(52) Cooperative Patent Classification (CPC):
B63B 32/51; B63B 32/59; B63B 32/64; B63B 32/66

(22) Date of filing: **31.03.2021**

(86) International application number:
PCT/KR2021/003968

(87) International publication number:
WO 2021/210813 (21.10.2021 Gazette 2021/42)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(30) Priority: **16.04.2020 KR 20200045668**
08.03.2021 KR 20210029914

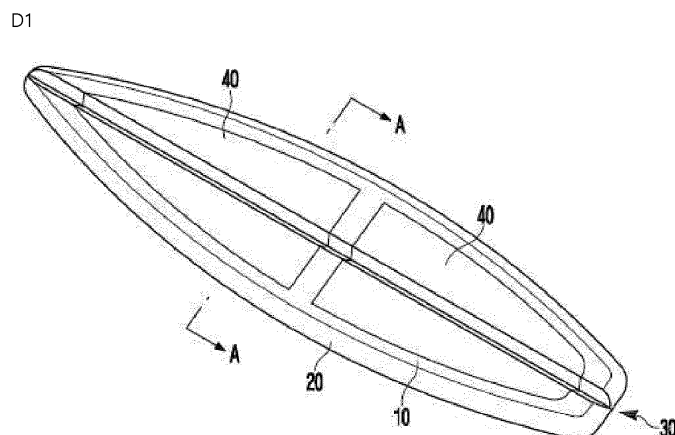
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(54) **INFLATABLE SURFBOARD AND MANUFACTURING METHOD THEREFOR**

(57) The present invention relates to an inflatable surfboard having a concave or convex straight part formed on the lower surface thereof, so as to improve the straightness of the board and more simply and stably maintain balance. The present surfboard comprises: a main body (10) formed in a long plate shape by cutting a drop-stitch fabric; a side tape (20) attached along the

open circumference of the main body (10) so as to seal same; a straight part (30) convexly or concavely formed in the longitudinal direction on the lower surface of the main body (10); a top reinforcing tape (40) attached to the upper surface of the main body (10); and a bottom reinforcing tape (50) attached to the lower surface of the main body (10).



Description

[Technical Field]

[0001] The present invention relates to an inflatable surfboard, and more particularly, to an inflatable surfboard having a concave or convex straight part formed on the lower surface thereof so as to improve the straightness of the surfboard and to more simply and stably maintain balance, and a manufacturing method of the inflatable surfboard.

[Background Art]

[0002] The number of people enjoying various leisure activities and leisure sports is increasing depending on recent improvement in standards of living. Particularly, surfing may be a typical example of leisure sports enjoyed on the water, and a surfboard, more concretely, a Stand Up Paddle board (SUP board) may be used in touring, kayaking, surfing or windsurfing.

[0003] Such a surfboard may be used in various manners in which a person gets on the surfboard with both feet, or person rides waves while lying face down on the surfboard.

[0004] In general, the surfboard has a length of about 1.5-4.5 m, a width of about 50-100 cm, and a thickness of about 7-15 cm, and thus has a considerable volume, and conventional surfboards were manufactured using wood and thus have a weight of about 50 kg or more. Therefore, the conventional surfboards are not easy to store and transport.

[0005] In order to solve such problems, use of polyurethane as a material for surfboards was proposed. However, a surfboard should have a designated size and thus there is a limit in reduction in the weight of the surfboard formed of polyurethane, and polyurethane is a hard material and thus the problems, such as difficulties in storage and transport of the surfboard are still not solved.

[0006] Further, as leisure activities are increased, simple surfing enjoyed in amusement parks equipped with water facilities, in addition to professional surfing or windsurfing, was introduced, but the conventional surfboards are not suitable for use in these facilities.

[0007] In order to solve such a problem, a surfboard using an air tube formed of a rubber material is manufactured, and the air tube forms the shape of a board through injection of air and is easily transported and stored through discharge of air, and thus, has convenience in use.

[0008] An air tube using drop-stitch fabric, in which shape maintenance lines are installed so as to maintain the shape of the air tube, is being applied to an inflatable surfboard now.

[0009] However, the above-described conventional technologies have the following problems.

[0010] The conventional inflatable surfboard has a flat lower surface, and thus does not properly secure the

straightness of the surfboard, thereby causing inconvenience in use.

[0011] Further, the conventional surfboard has a flat lower surface, and may thus slid over the surface of the water in various directions, and thereby, a user on the surfboard may easily lose balance and may thus fall.

[Disclosure]

10 [Technical Problem]

[0012] Therefore, the present invention has been made in view of the above problems,

15 **[0013]** and it is an object of the present invention to provide an inflatable surfboard which has a concave or convex straight part formed on the lower surface thereof so as to improve the straightness of the surfboard and to have a stable structure through prevention of bending of the surfboard due to weight or external force, and a manufacturing method of the inflatable surfboard.

20 **[0014]** It is another object of the present invention to provide an inflatable surfboard which includes an angle adjuster installed therein so as to easily adjust the angle of the front part of the surfboard through simple operation, and a pin box embedded therein so as to minimize resistance of the pin box to water.

[Technical Solution]

30 **[0015]** In accordance with an aspect of the present invention, the above and other objects can be accomplished by the provision of "an inflatable surfboard" including a main body formed by cutting drop-stitch fabric having a plurality of shape maintenance lines provided with both ends coupled to upper and lower inner surfaces of the drop-stitch fabric, into a long plate shape; a side tape adhered to a circumference of the main body so as to seal the main body and thus to form an air tube; and a straight part convexly or concavely formed in a longitudinal direction on a lower surface of the main body so as to secure straightness of the main body.

35 **[0016]** Further, the straight part of "the inflatable surfboard" may include a folded part formed on an upper surface of the main body to be folded in a concave shape in the longitudinal direction, a V tape having a lower surface adhered to an upper surface of the folded part in a V shape, a straight concave part formed in a concave shape rectilinearly on an upper surface of the V tape on the upper surface of the main body in the longitudinal direction, and a straight convex part formed in a convex shape rectilinearly on the lower surface of the main body in the longitudinal direction so as to correspond to the straight concave part.

40 **[0017]** Further, the straight part of "the inflatable surfboard" may include a folded part formed on the lower surface of the main body to be folded in a concave shape in the longitudinal direction, a V tape having an upper surface adhered to a lower surface of the folded part in

a V shape, a straight concave part formed in a concave shape rectilinearly on a lower surface of the V tape on the lower surface of the main body in the longitudinal direction, and a straight convex part formed in a convex shape rectilinearly on an upper surface of the main body in the longitudinal direction so as to correspond to the straight concave part.

[0018] Further, a depth of a folded region of the folded part of "the inflatable surfboard" may be gradually increased or decreased so that the straight concave part and the straight convex part are formed to be inclined.

[0019] Further, at least one straight part of "the inflatable surfboard" may be formed on the lower surface of the main body.

[0020] Further, "the inflatable surfboard" may further include a top reinforcing tape adhered to an upper surface of the main body; and a bottom reinforcing tape adhered to the lower surface of the main body.

[0021] Further, "the inflatable surfboard" may further include a pair of first V tapes symmetrically provided on the upper surface of the main body, and formed in a V shape such that upper ends and lower ends of the first V tapes are adhered between both edges of the upper surface of the main body and a lower surface of the top reinforcing tape so as to form vacant spaces between the main body and the top reinforcing tape; and a pair of second V tapes symmetrically provided on the upper surface of the main body so as to be spaced apart from the first V tapes, and formed in a V shape such that upper ends and lower ends of the second V tapes are adhered between the upper surface of the main body and the lower surface of the top reinforcing tape so as to form the vacant spaces among the main body, the top reinforcing tape and the first V tapes.

[0022] Further, "the inflatable surfboard" may further include an angle adjuster installed on an upper surface of the main body, and configured to pull a front end of the main body upwards so as to adjust an angle of bending of the front end of the main body.

[0023] Further, the angle adjuster of "the inflatable surfboard" may include a pulling strap having a front end provided with a lower surface adhered to an upper surface of the front end of the main body, and configured to protrude rearwards, a hook plate mounted at a rear end of the pulling strap, a fixing strap having a rear end provided with a lower surface adhered to the upper surface of the main body behind the hook plate, and a hanging plate mounted at a front end of the fixing strap, and configured such that the hook plate is hung on the hanging plate in a state in which a distance between the hanging plate and the hook plate is adjusted so that an angle of the main body is adjusted by controlling a distance between the pulling strap and the fixing strap.

[0024] Further, the hook plate of "the inflatable surfboard" may include a first fixing hole formed in a front end of the hook plate so that the rear end of the pulling strap is inserted into the first fixing hole so as to be fixed, and a hook formed at a rear end of the hook plate behind

the first fixing hole.

[0025] Further, the hanging plate of "the inflatable surfboard" may include a plurality of hanging holes sequentially formed in the hanging plate so that the hook is inserted into one of the hanging holes, and a second fixing hole formed in a rear end of the hanging plate so that the front end of the fixing strap is inserted into the second fixing hole so as to be fixed.

[0026] Further, the angle adjuster of "the inflatable surfboard" may include a front strap having a front end provided with a lower surface adhered to an upper surface of a front end of the main body and configured to protrude rearwards, a male clip having a through hole configured such that a rear end of the front strap in a folded state is inserted there into, and a protrusion configured to protrude rearwards, a hanging member configured such that the rear end of the front strap passes there through so that the hanging member is caught by an upper surface of the male clip and a folded part of the front strap is hung on the hanging member in a state in which a length of the front strap is adjusted, a rear strap provided behind the hanging member and having a rear end provided with a lower surface adhered to an upper surface of the main body, and a female clip mounted at a front end of the rear strap and configured such that the protrusion of the male clip is inserted into the female clip so as to be fixed or fixation of the protrusion is released by pressing buttons provided on side surfaces of the female clip.

[0027] Further, the main body of "the inflatable surfboard" may include an insertion recess depressed into a lower surface of a rear end of the main body, and the inflatable surfboard may further include a pin structure including a pin box inserted into the insertion recess and having a circumferential protrusion configured to protrude horizontally along an outer circumference of the pin box and adhered to the lower surface of the main body, and a mount recess formed in a lower surface of the pin box, and a pin having a mount part formed at an upper end thereof so as to be detachably mounted in the mount recess.

[0028] Further, the pin structure of "the inflatable surfboard" may further include a hollow cube-shaped receipt box having an open upper part, formed integrally with an upper part of the pin box, provided to penetrate the main body vertically, and having an adhesion protrusion configured to protrude horizontally along an outer circumference of an upper end of the receipt box so as to be adhered to an upper surface of the main body, and a lid detachably inserted into the open upper part of the receipt box.

[0029] In accordance with another aspect of the present invention, there is provided "a manufacturing method of an inflatable surfboard" including cutting drop-stitch fabric, having a plurality of shape maintenance lines provided with both ends coupled to upper and lower inner surfaces of the drop-stitch fabric, into a long plate shape so as to form a main body; preparing tapes includ-

ing a side tape adhered to a circumference of the main body by cutting; forming a straight part configured to protrude rectilinearly or to be depressed rectilinearly on a lower surface of the main body by folding an upper surface or the lower surface of the main body; and adhering the side tape to the circumference of the main body so as to seal the main body and thus to form the main body into an air tube.

[0030] Further, the forming the straight part in "the manufacturing method" may include forming a folded part in a concave shape on the upper surface of the main body by folding the main body in a longitudinal direction, and adhering both sides of a lower surface of a V tape to both sides of an upper end of the folded part.

[0031] Further, the forming the straight part in "the manufacturing method" may include forming a folded part in a concave shape on the lower surface of the main body by folding the main body in a longitudinal direction, and adhering both sides of a lower surface of a V tape to both sides of an upper end of the folded part.

[0032] Further, "the manufacturing method" may further include adhering reinforcing tapes to the upper surface and the lower surface of the main body, respectively, after the forming the straight part.

[0033] Further, the adhering the reinforcing tapes to the upper surface and the lower surface of the main body in "the manufacturing method" may include adhering pairs of V tapes to the upper surface of the main body so as to form vacant spaces symmetrically disposed at both sides of the upper surface of the main body and configured to form air tubes by injecting air into the vacant spaces, before the reinforcing tapes are adhered to the upper surface and the lower surface of the main body.

[Advantageous effects]

[0034] As described above, an inflatable surfboard according to the present invention has a concave or convex straight part formed on the lower surface thereof so as to improve the straightness of the surfboard and to have a stable structure through prevention of bending of the surfboard due to weight or external force, thereby being capable of having improved rigidity and remarkably improving stability in use.

[0035] Further, the inflatable surfboard according to the present invention includes an angle adjuster installed thereon so as to easily adjust the angle of the front part of the surfboard through simple operation based on the amount and the height of waves and thus to improve convenience in operation depending on the conditions of waves, and includes a pin box embedded in a main body so as to minimize resistance of the pin box to water and thus to have propulsive force similar to a surfboard manufactured using a hard material.

[Description of Drawings]

[0036]

FIG. 1 is a schematic perspective view of a surfboard according to a first embodiment of the present invention.

FIG. 2 is a schematic longitudinal-sectional view taken along line A-A of FIG. 1.

FIG. 3 is a schematic enlarged side-sectional view of an essential part of the surfboard, taken along line B-B of FIG. 2.

FIG. 4 is a schematic bottom view of the surfboard according to the first embodiment of the present invention.

FIG. 5 is a schematic longitudinal-sectional view of a surfboard according to a second embodiment of the present invention.

FIG. 6 is a schematic enlarged side-sectional view of an essential part of a surfboard according to a third embodiment of the present invention.

FIG. 7 is a schematic bottom view of a surfboard according to a fourth embodiment of the present invention.

FIG. 8 is a schematic perspective view of a surfboard according to a fifth embodiment of the present invention.

FIG. 9 is a schematic perspective view of an essential part of the surfboard according to the fifth embodiment of the present invention.

FIG. 10 is a schematic enlarged side-sectional view of an essential part of the front end of the surfboard according to the fifth embodiment of the present invention.

FIG. 11 is a schematic enlarged side-sectional view of the essential part of the surfboard according to the fifth embodiment of the present invention, showing the state in which the angle of the front end of the surfboard is adjusted.

FIG. 12 is a schematic exploded perspective view of an essential part of the bottom surface of the surfboard according to the fifth embodiment of the present invention.

FIG. 13 is a schematic enlarged side-sectional view of an essential part of the rear end of the surfboard according to the fifth embodiment of the present invention.

FIG. 14 is a schematic enlarged side-sectional view of an essential part of the rear end of a surfboard according to a sixth embodiment of the present invention.

FIG. 15 is a schematic perspective view of a surfboard according to a seventh embodiment of the present invention.

FIG. 16 is a schematic perspective view of an essential part of the surfboard according to the seventh embodiment of the present invention.

FIG. 17 is a schematic enlarged perspective view of an essential part of the front end of the surfboard according to the seventh embodiment of the present invention.

FIG. 18 is a schematic enlarged side-sectional view

of the essential part of the surfboard according to the seventh embodiment of the present invention, showing the state in which the angle of the front end of the surfboard is adjusted.

FIG. 19 is a schematic longitudinal-sectional view of a surfboard according to an eighth embodiment of the present invention.

FIG. 20 is a schematic structural view illustrating the surfboard according to the eighth embodiment of the present invention.

FIG. 21 is a schematic flowchart representing a manufacturing method of a surfboard according to the present invention.

FIGs. 22 and 23 are diagrams showing the manufacturing method of the surfboard according to the present invention.

[Best Mode]

[0037] Hereinafter, reference will be made in detail to preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings, to make the description of the present invention thorough. The embodiments of the present invention are not limited to the aspects disclosed herein but may be implemented in various different forms.

[0038] FIGs. 1 to 4 are schematic views of a surfboard according to a first embodiment of the present invention. As shown in these figures, the inflatable surfboard according to the first embodiment of the present invention includes a main body 10 formed in a long plate shape by cutting drop-stitch fabric, a side tape 20 adhered along the open circumference of the main body 10 so as to seal the main body 10, a straight part 30 convexly or concavely formed in the longitudinal direction on the lower surface of the main body 10, a top reinforcing tape 40 adhered to the upper surface of the main body 10, and a bottom reinforcing tape 50 adhered to the lower surface of the main body 10.

[0039] The main body 10 is formed by cutting the drop-stitch fabric having a plurality of shape maintenance lines 11, both ends of which are coupled to upper and lower inner surfaces of the drop-stitch fabric, into a long plate shape, and the drop-stitch fabric serves to form the flat main body 10 of the surfboard.

[0040] Of course, a well-known air inlet is installed in the main body 10 so that a user injects air into the main body 10 or discharges air from the main body 10 through the air inlet.

[0041] The main body 10 has the plurality of shape maintenance lines 11, both ends of which are coupled to upper and lower inner surfaces of the main body 10, and the shape maintenance lines 11 are well-known to interconnect the inner surfaces of the main body 10 formed in an air tube type so as to allow the main body 10 to maintain a designated flat shape.

[0042] An air tube configured to form the main body 10 and to have the plurality of shape maintenance lines 11

provided therein so as to maintain the shape of the main body 10 is referred to as a "Drop Stitch Material" in the art.

[0043] The side tape 20 is adhered along the circumference of the main body 10 so as to seal the main body 10, and serves to form the main body 10 into a sealed air tube type.

[0044] The straight part 30 is convexly or concavely formed in the longitudinal direction on the lower surface of the main body 10, and serves to improve the straightness of the main body 10 and to effectively prevent bending of the main body 10 in the forward and rearward directions due to weight or external force, thereby improving rigidity of the main body 10 while facilitating formation of the stable structure of the main body 10.

[0045] The straight part 30 includes a folded part 31 formed on the upper surface of the main body 10 to be folded in a concave shape in the longitudinal direction, a V tape 32 having a lower surface adhered to the upper surface of the folded part 31 in a V shape, a straight concave part 33 formed in a concave shape rectilinearly on the upper surface of the V tape 32 on the upper surface of the main body 10 in the longitudinal direction, and a straight convex part 34 formed in a convex shape rectilinearly on the lower surface of the main body 10 in the longitudinal direction so as to correspond to the straight concave part 33.

[0046] The folded part 31 is formed rectilinearly on the upper surface of the main body 10 to be folded concavely, and serves to form a depression rectilinearly on the upper surface of the main body 10.

[0047] The V tape 32 is adhered to the upper surface of the folded part 31 so as to maintain the folded state of the folded part 31.

[0048] The straight concave part 33 is formed in the concave shape rectilinearly on the upper surface of the main body 10 by the folded part 31, the straight convex part 34 is formed in the convex shape rectilinearly on the lower surface of the main body 10 by the folded part 31, and thus, the straight concave part 33 and the straight convex part 34 improve the straightness of the main body 10 and effectively prevent bending of the main body 10 in the forward and rearward directions due to weight or external force, thereby improving rigidity of the main body 10 while facilitating formation of the stable structure of the main body 10.

[0049] The above-described straight part 30 may be formed in a straight line from the front end to the rear end of the main body 10, as shown in FIG. 4, without being limited thereto, or may be formed to a desired length or in a desired region depending on manufacturer's intention.

[0050] The top reinforcing tape 40 is adhered to the upper surface of the main body 10 and serves to reinforce the upper surface of the main body 10, and the bottom reinforcing tape 50 is adhered to the lower surface of the main body 10 and serves to reinforce the lower surface of the main body 10.

[0051] FIG. 5 is a schematic longitudinal-sectional

view of a surfboard according to a second embodiment of the present invention. As shown in this figure, the straight part 31 of the inflatable surfboard according to the second embodiment of the present invention includes a folded part 31 formed on the lower surface of the main body 10 to be folded concavely in the longitudinal direction, a V tape 32 having an upper surface adhered to the lower surface of the folded part 31 into a V shape, a straight concave part 33 formed in a concave shape rectilinearly on the lower surface of the V tape 32 on the lower surface of the main body 10 in the longitudinal direction, and a straight convex part 34 formed in a convex shape rectilinearly on the upper surface of the main body 10 in the longitudinal direction so as to correspond to the straight concave part 33.

[0052] The folded part 31 is formed rectilinearly on the lower surface of the main body 10 to be folded concavely, and serves to form a depression rectilinearly on the lower surface of the main body 10.

[0053] The V tape 32 is adhered to the lower surface of the folded part 31 so as to maintain the folded state of the folded part 31.

[0054] The straight concave part 33 is formed in the concave shape rectilinearly on the lower surface of the main body 10 by the folded part 31, and serves to improve the straightness of the main body 10. The straight convex part 34 is formed in the convex shape rectilinearly on the upper surface of the main body 10 by the folded part 31.

[0055] That is, a concave region is formed rectilinearly on the lower surface of the main body 10 of the surfboard, and thus improves the straightness of the surfboard and prevents bending of the main body 10 in the forward and rearward directions due to weight or external force, thereby improving rigidity of the surfboard while facilitating formation of the stable structure of the surfboard.

[0056] FIG. 6 is a schematic enlarged side-sectional view of an essential part of a surfboard according to a third embodiment of the present invention. As shown in this figure, the folded part 31 of the inflatable surfboard according to the third embodiment of the present invention is formed such that a depth of a folded region of the folded part 31 is gradually increased in a direction from the front end to the rear end of the surfboard. That is, as shown in this figure, the depth is gradually increased from a small value m to a large value M in the direction from the front end to the rear end of the surfboard.

[0057] When the depth of the folded part 31 is gradually increased as such, the straight concave part 33 depressed from the upper surface of the main body 10 is gradually more depressed, and the straight convex part is gradually more protruded.

[0058] On the contrary, the folded part 31 may be formed such that the depth of the folded region of the folded part 31 is gradually decreased in the direction from the front end to the rear end of the surfboard, and thereby, the straight convex part may be gradually less protruded.

[0059] The surfboard is generally manufactured in a structure in which the straight convex part is gradually

more protruded as the straight convex part is closer to the rear end of the board, so as to improve straightness and to easily maintain balance.

[0060] FIG. 7 is a schematic bottom view of a surfboard according to a fourth embodiment of the present invention. As shown in this figure, the inflatable surfboard according to the fourth embodiment of the present invention may include at least one straight part 30, i.e., one straight part 30 or a plurality of straight parts 30, may be formed on the lower surface of the main body 10. As shown in this figure, two straight parts 30 may be formed on the lower surface of the main body 10.

[0061] As described above, the straight parts 30 may be formed in plural depending on the shape, the size, the degree of straightness, or the degree of rigidity of the main body 10.

[0062] FIGs. 8 to 13 are schematic views of a surfboard according to a fifth embodiment of the present invention. As shown in these figures, the inflatable surfboard according to the fifth embodiment of the present invention further includes an angle adjuster 60 installed on the upper surface of the main body 10, and a pin structure 70 installed on the lower surface of the rear end of the main body 10.

[0063] The angle adjuster 60 is installed on the upper surface of the main body 10, and pulls the front end of the main body 10 to bend the front end of the main body 10 upwards so that the angle of bending of the front end of the main body 10 may be adjusted.

[0064] The angle adjuster 60 includes a pulling strap 61 having a front end, the lower surface of which is adhered to the upper surface of the front end of the main body 10, and configured to protrude rearwards, a hook plate 62 mounted at the rear end of the pulling strap 61, a fixing strap 63 having a rear end, the lower surface of which is adhered to the upper surface of the main body 10, in the rear of the hook plate 62, and a hanging plate 64 mounted at the front end of the fixing strap 63 and configured such that the hook plate 62 is hung on the hanging plate 64 in the state in which the distance between the hanging plate 64 and the hook plate 62 hung on the hanging plate 64 is adjusted so that the angle of the main body 10 is adjusted by controlling the distance between the pulling strap 61 and the fixing strap 63.

[0065] The pulling strap 61 is generally formed of a fabric material, and serves to pull the front end of the main body 10 by user's hand so as to lift the front end of the main body 10 and thus to bend the front end of the main body 10 at a desired angle while providing a place in which the hook plate 62 is installed.

[0066] The hook plate 62 is a hard plate generally formed of a metal or a synthetic resin, and is hung on the hanging plate 64 so as to be fixed in the state in which the distance between the pulling strap 61 and the fixing strap 63 is adjusted.

[0067] The hook plate 62 includes a first fixing hole 621 formed in the front end of the hook plate 62 so that the rear end of the pulling strap 61 is inserted into the first

fixing hole 621 so as to be fixed, and a hook 622 formed at the rear end of the hook plate 62 in the rear of the first fixing hole 621.

[0068] The first fixing hole 621 serves to provide a space into which the pulling strap 61 is inserted so as to be fixed by sewing, and the hook 622 is hung on the hanging plate 64 so as to be separably fixed in the state in which the distance between the pulling strap and the fixing strap is adjusted.

[0069] The fixing strap 63 is generally formed of a fabric material, and serves to provide a place to which the hanging plate 64 is fixed.

[0070] The hanging plate 64 is a hard plate generally formed of a metal or a synthetic resin, and serves to provide a place on which the hook plate 62 is hung in the state in which the hanging plate 64 is fixed to the fixing strap 63 and the distance between the hook plate 62 and the hanging plate 64 is adjusted.

[0071] The hanging plate 64 includes a plurality of hanging holes 641 sequentially formed in the hanging plate 64 so that the hook 622 is inserted into one of the hanging holes 641, and a second fixing hole 642 formed in the rear end of the hanging plate 64 so that the front end of the fixing strap 63 is inserted into the second fixing hole 642 so as to be fixed.

[0072] The hanging holes 641 serve to provide spaces into which the hook 622 is sequentially inserted, and thereby, the angle of bending of the front end of the main body 10 may be adjusted through the pulling strap 61 while the distance between the hook plate 62 and the hanging plate 64 is adjusted. The second fixing hole 642 provides a space into which the fixing strap 63 is inserted so as to be fixed by sewing.

[0073] The pin structure 70 includes a pin box 71 inserted into an insertion recess 12 formed in the main body 10 and having a circumferential protrusion 711 protruding horizontally along the outer circumference of the pin box 71 and adhered to the lower surface of the main body 10, and a mount recess 712 formed in the lower surface of the pin box 71, and a pin 72 having a mount part 721 formed at the upper end thereof so as to be detachably mounted in the mount recess 712.

[0074] The pin box 71 serves to provide a space in which the pin 72 is detachably mounted, and the circumferential protrusion 711 serves to provide an adhesion region in which the pin box 71 is firmly adhered to the lower surface of the main body 10. The mount recess 712 serves to provide a space into which the mount part 721 of the pin 72 is inserted so as to be detachably fixed.

[0075] The pin 72 is a well-known skeg which serves to prevent the body of a ship from rolling so as to allow the ship to safely move straight. The mount part 721 is inserted into the mount recess 712 so that the pin 72 may be detachably fixed to the pin box 71.

[0076] The pin box 71 is inserted into the insertion recess 12 without protruding from the lower surface of the main body 10, and thus, occurrence of water resistance by the pin box 71 may be prevented or minimized.

[0077] FIG. 14 is a schematic enlarged side-sectional view of an essential part of the rear end of a surfboard according to a sixth embodiment of the present invention. As shown in this figure, the pin structure 70 of the inflatable surfboard according to the sixth embodiment of the present invention further includes a hollow cube-shaped receipt box 73 having an open upper part, which is formed integrally with the upper part of the pin box 71, is provided to penetrate the main body 10 vertically, and has an adhesion protrusion 731 protruding horizontally along the outer circumference of the upper end of the receipt box 73 so as to be adhered to the upper surface of the main body 10, and a lid 74 detachably inserted into the open upper part of the receipt box 73.

[0078] The receipt box 73 serves to provide a space in which a user may store private supplies, the adhesion protrusion 731 serves to provide an adhesion region in which the receipt box 73 may be firmly adhered to the upper surface of the main body 10, and the lid 74 allows the user to open and close the receipt box 73.

[0079] FIGs. 15 to 18 are schematic views of a surfboard according to a seventh embodiment of the present invention. As shown in these figures, the inflatable surfboard according to the seventh embodiment of the present invention further includes an angle adjuster 60 installed on the upper surface of the main body 10.

[0080] The angle adjuster 60 is installed on the upper surface of the main body 10, and pulls the front end of the main body 10 to bend the front end of the main body 10 upwards so that the angle of bending of the front end of the main body 10 may be adjusted.

[0081] The angle adjuster 60 includes a front strap 61a having a front end, the lower surface of which is adhered to the upper surface of the front end of the main body 10, and configured to protrude rearwards, a male clip 62a having a through hole 621a configured such that the rear end of the front strap 61a in a folded state is inserted therein to, and a protrusion 622a configured to protrude rearwards, a hanging member 63a configured such that the rear end of the front strap 61a passes there through so that the hanging member 63a is caught by the upper surface of the male clip 62a and the folded part of the front strap 61a is hung on the hanging member 63a in the state in which the length of the front strap 61a is adjusted, a rear strap 64a provided in the rear of the hanging member 63a and having a rear end, the lower surface of which is adhered to the upper surface of the main body 10, and a female clip 65a mounted at the front end of the rear strap 64a and configured such that the protrusion 622a of the male clip 62a may be inserted into the female clip 65a so as to be fixed or fixation of the protrusion 622a may be released by pressing buttons 651a provided on the side surfaces of the female clip 65a.

[0082] The front strap 61a is generally formed of a fabric material, and serves to pull the front end of the main body 10 by user's hand so as to lift the front end of the main body 10 and thus to bend the front end of the main body 10 at a desired angle and also serves to provide a

place in which the male clip 62a and the hanging member 63a are installed.

[0083] The male clip 62a is provided as a hard plate generally formed of a metal or a synthetic resin, and serves to fix the front strap 61a in the state in which the distance between the front strap 61a and the rear strap 64a is adjusted by engaging the protrusion 622a with the female clip 65a, and also serves to support the hanging member 63a. The front strap 61a in the folded state may pass through the through holes 621a.

[0084] The hanging member 63a is provided as a hard plate generally formed of a metal or a synthetic resin, and serves to firmly fix the front strap 61a hung on the male clip 62a. The rear strap 64a is generally formed of a fabric material, and serves to provide a place in which the female clip 65a is fixed.

[0085] The female clip 65a may be well known to allow the protrusion 622a of the male clip 62 to be inserted thereinto so as to be fixed in the state in which the distance between the front strap 61a and the rear strap 64a is adjusted, and to release fixation of the protrusion 622a by pressing the buttons 651a.

[0086] FIGs. 19 and 20 are schematic views of a surfboard according to an eighth embodiment of the present invention. As shown in these figures, the surfboard according to the eighth embodiment of the present invention further includes a pair of first V tapes 80 adhered between both sides of the upper surface of the main body 10 and the top reinforcing tape 40, and a pair of second V tapes 90 adhered between both sides of the upper surface of the main body 10 and the top reinforcing tape 40 and located inside the first V tapes 80.

[0087] The first V tapes 80 are symmetrically provided in a pair on the upper surface of the main body 10, and are formed in a V shape such that the upper ends and the lower ends are adhered between both edges of the upper surface of the main body 10 and the lower surface of the top reinforcing tape 40, and one side of each of the first V tapes 80 is adhered to the upper surface of the main body 10 and the other side of each of the first V tapes 80 is adhered to the lower surface of the top reinforcing tape 40 so as to form vacant spaces between the upper surface of the main body 10 and the lower surface of the top reinforcing tape 40.

[0088] The second V tapes 90 are symmetrically provided in a pair on the upper surface of the main body 10 so as to be spaced apart from the first V tapes 80, and are formed in a V shape such that the upper ends and the lower ends are adhered between the upper surface of the main body 10 and the lower surface of the top reinforcing tape 40, and one side of each of the second V tapes 90 is adhered to the upper surface of the main body 10 and the other side of each of the second V tapes 90 is adhered to the lower surface of the top reinforcing tape 40 so as to form the vacant spaces between the upper surface of the main body 10 and the lower surface of the top reinforcing tape 40.

[0089] That is, the first V tapes 80 and the second V

tapes 90 are symmetrically provided so as to be spaced apart from each other, and thereby, the vacant spaces, in which the top reinforcing tape 40 is not adhered to the upper surface of the main body, are formed there between, and air tubes are formed by injecting air into the vacant spaces.

[0090] In the surfboard having the above-described configuration according to the eighth embodiment of the present invention, as shown in FIG. 20, when air is injected into the main body 10 and injected into the vacant spaces defined by the top reinforcing tape 40, the first V tapes 80 and the second V tapes 90, the vacant spaces form air tubes and cause both sides of the main body 10 to bulge downwards, and thus, the surfboard has a shape which may minimize overturn.

[0091] FIGs. 21 to 23 are schematic views showing a manufacturing method of a surfboard according to the present invention. As shown in these figures, the manufacturing method of the inflatable surfboard according to the present invention includes cutting drop-stitch fabric so as to form a main body (S10), cutting tapes including a side tape (S20), forming a straight part on the lower surface of the main body (S30), adhering reinforcing tapes to the upper surface and the lower surface of the main body, respectively (S40), and adhering the side tape to the circumference of the main body so as to seal the main body (S50).

[0092] In an operation of cutting the drop-stitch fabric (S10), the main body of the surfboard is formed by cutting the drop-stitch fabric having a plurality of shape maintenance lines, both ends of which are coupled to upper and lower inner surfaces of the drop-stitch fabric, into a long plate shape.

[0093] Here, the shape maintenance lines are well-known to interconnect the inner surfaces of the air tube-type main body so as to allow the main body to maintain a designated flat shape, and the drop-stitch fabric indicates an air tube configured to form the main body and to have the plurality of shape maintenance lines provided therein so as to maintain the shape of the main body 10 and is referred to as a Drop Stitch Material in the art.

[0094] The main body may be formed by cutting the drop-stitch fabric such that the upper surface and the lower surface thereof have the same size, or such that the upper surface and the lower surface thereof have different sizes as necessary. In general, the main body may be formed by cutting the drop-stitch fabric such that the front end of the upper surface of the main body is smaller than the rear end of the lower surface of the main body so as to bend the front end of the main body upwards.

[0095] In an operation of cutting the tapes (S20), the tapes including the side tape adhered to the circumference of the main body are prepared by cutting. Here, the side tape is adhered to the circumference of the opened side surface of the main body so as to seal the main body, and thus forms the main body into an air tube type.

[0096] In an operation of forming the straight part

(S30), the straight part, which protrudes rectilinearly or is depressed rectilinearly, is formed on the lower surface of the main body by folding the upper surface or the lower surface of the main body. The straight part protrudes rectilinearly from the lower surface of the main body or is depressed rectilinearly into the lower surface of the main body, and thus improves the straightness of the main body and effectively prevents bending of the main body in the forward and rearward directions due to weight or external force, thereby improving rigidity of the main body while facilitating formation of the stable structure of the main body.

[0097] The operation of forming the straight part (S30) includes forming a folded part in a concave shape on the upper surface of the main body by folding the main body in the longitudinal direction, and adhering the lower surface of a V tape to the upper surface of the folded part, and thus, a protrusion is formed rectilinearly on the lower surface of the main body, and improves the straightness of the main body.

[0098] Here, the folded part is formed rectilinearly on the upper surface of the main body 10 to be folded concavely, and serves to form a depression rectilinearly on the lower surface of the main body, and the V tape is adhered to the upper surface of the folded part so as to maintain the folded state of the folded part.

[0099] Otherwise, the operation of forming the straight part (S30) includes forming the folded part in a concave shape on the lower surface of the main body by folding the main body in the longitudinal direction, and adhering the upper surface of the V tape to the lower surface of the folded part, and thus, a depression is formed rectilinearly on the lower surface of the main body, improves the straightness of the main body, and effectively prevents bending of the main body in the forward and rearward directions due to weight or external force, thereby improving rigidity of the main body while facilitating formation of the stable structure of the main body.

[0100] In an operation of adhering the reinforcing tapes (S40), the reinforcing tapes are adhered to the upper surface and the lower surface of the main body, respectively. The reinforcing tapes serve to reinforce the upper surface and the lower surface of the main body.

[0101] The operation of adhering the reinforcing tapes to the upper surface and the lower surface of the main body (S40) may include adhering pairs of V tapes to the upper surface of the main body so as to form vacant spaces symmetrically disposed at both sides of the upper surface of the main body and configured to form air tubes by injecting air into the vacant spaces, before the reinforcing tapes are adhered to the upper surface and the lower surface of the main body.

[0102] Here, the pairs of V tapes include a pair of first V tapes and a pair of second V tapes, as shown in FIGs. 19 and 20, and form a pair of vacant spaces between the main body and the reinforcing tape adhered to the upper surface of the main body, and a structure in which both sides of the main body bulge downwards may be formed

by injecting air into the vacant spaces.

[0103] In an operation of adhering the side tape to the circumference of the main body (S50), the side tape is adhered to the circumference of the main body so as to seal the main body, and thus, forms the main body into an air tube type. Here, the side tape is adhered to the circumference of the main body so as to seal the main body, and thus form the air tube-type main body.

[0104] Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims. Accordingly, it is to be understood that the present invention described as above is not limited by the aspects described herein and the accompanying drawings. Therefore, the scope of the present invention is defined not by the detailed description, but by the claims and their equivalents.

[0105] Further, while the invention has been explained in relation to its embodiments, it is to be understood that various modifications thereof will become apparent to those skilled in the art upon reading the specification.

Claims

1. An inflatable surfboard comprising:

a main body formed by cutting drop-stitch fabric having a plurality of shape maintenance lines provided with both ends coupled to upper and lower inner surfaces of the drop-stitch fabric, into a long plate shape;
a side tape adhered to a circumference of the main body so as to seal the main body and thus to form an air tube; and
a straight part convexly or concavely formed in a longitudinal direction on a lower surface of the main body so as to secure straightness of the main body.

2. The inflatable surfboard according to claim 1, wherein the straight part comprises:

a folded part formed on an upper surface of the main body to be folded in a concave shape in the longitudinal direction;
a V tape having a lower surface adhered to an upper surface of the folded part in a V shape;
a straight concave part formed in a concave shape rectilinearly on an upper surface of the V tape on the upper surface of the main body in the longitudinal direction; and
a straight convex part formed in a convex shape rectilinearly on the lower surface of the main body in the longitudinal direction so as to corre-

- spend to the straight concave part.
3. The inflatable surfboard according to claim 1, wherein the straight part comprises:
 - a folded part formed on the lower surface of the main body to be folded in a concave shape in the longitudinal direction;
 - a V tape having an upper surface adhered to a lower surface of the folded part in a V shape;
 - a straight concave part formed in a concave shape rectilinearly on a lower surface of the V tape on the lower surface of the main body in the longitudinal direction; and
 - a straight convex part formed in a convex shape rectilinearly on an upper surface of the main body in the longitudinal direction so as to correspond to the straight concave part.
 4. The inflatable surfboard according to claim 2 or 3, wherein a depth of a folded region of the folded part is gradually increased or decreased so that the straight concave part and the straight convex part are formed to be inclined.
 5. The inflatable surfboard according to claim 1, wherein at least one straight part is formed on the lower surface of the main body.
 6. The inflatable surfboard according to claim 1, further comprising:
 - a top reinforcing tape adhered to an upper surface of the main body; and
 - a bottom reinforcing tape adhered to the lower surface of the main body.
 7. The inflatable surfboard according to claim 6, further comprising:
 - a pair of first V tapes symmetrically provided on the upper surface of the main body, and formed in a V shape such that upper ends and lower ends of the first V tapes are adhered between both edges of the upper surface of the main body and a lower surface of the top reinforcing tape so as to form vacant spaces between the main body and the top reinforcing tape; and
 - a pair of second V tapes symmetrically provided on the upper surface of the main body so as to be spaced apart from the first V tapes, and formed in a V shape such that upper ends and lower ends of the second V tapes are adhered between the upper surface of the main body and the lower surface of the top reinforcing tape so as to form the vacant spaces among the main body, the top reinforcing tape and the first V tapes.
 8. The inflatable surfboard according to claim 1, further comprising:
 - an angle adjuster installed on an upper surface of the main body, and configured to pull a front end of the main body upwards so as to adjust an angle of bending of the front end of the main body.
 9. The inflatable surfboard according to claim 8, wherein the angle adjuster comprises:
 - a pulling strap having a front end provided with a lower surface adhered to an upper surface of the front end of the main body, and configured to protrude rearwards;
 - a hook plate mounted at a rear end of the pulling strap;
 - a fixing strap having a rear end provided with a lower surface adhered to the upper surface of the main body behind the hook plate; and
 - a hanging plate mounted at a front end of the fixing strap, and configured such that the hook plate is hung on the hanging plate in a state in which a distance between the hanging plate and the hook plate is adjusted so that an angle of the main body is adjusted by controlling a distance between the pulling strap and the fixing strap.
 10. The inflatable surfboard according to claim 9, wherein the hook plate comprises:
 - a first fixing hole formed in a front end of the hook plate so that the rear end of the pulling strap is inserted into the first fixing hole so as to be fixed; and
 - a hook formed at a rear end of the hook plate behind the first fixing hole.
 11. The inflatable surfboard according to claim 9, wherein the hanging plate comprises:
 - a plurality of hanging holes sequentially formed in the hanging plate so that the hook is inserted into one of the hanging holes; and
 - a second fixing hole formed in a rear end of the hanging plate so that the front end of the fixing strap is inserted into the second fixing hole so as to be fixed.
 12. The inflatable surfboard according to claim 1, wherein the angle adjuster comprises:
 - a front strap having a front end provided with a lower surface adhered to an upper surface of a front end of the main body and configured to protrude rearwards;
 - a male clip having a through hole configured such that a rear end of the front strap in a folded

state is inserted therein, and a protrusion configured to protrude rearwards;

a hanging member configured such that the rear end of the front strap passes there through so that the hanging member is caught by an upper surface of the male clip and a folded part of the front strap is hung on the hanging member in a state in which a length of the front strap is adjusted;

a rear strap provided behind the hanging member and having a rear end provided with a lower surface adhered to an upper surface of the main body; and

a female clip mounted at a front end of the rear strap and configured such that the protrusion of the male clip is inserted into the female clip so as to be fixed or fixation of the protrusion is released by pressing buttons provided on side surfaces of the female clip.

13. The inflatable surfboard according to claim 1, wherein the main body comprises:

an insertion recess depressed into a lower surface of a rear end of the main body, wherein the inflatable surfboard further comprises:

a pin structure comprising a pin box inserted into the insertion recess and having a circumferential protrusion configured to protrude horizontally along an outer circumference of the pin box and adhered to the lower surface of the main body, and a mount recess formed in a lower surface of the pin box, and a pin having a mount part formed at an upper end thereof so as to be detachably mounted in the mount recess.

14. The inflatable surfboard according to claim 13, wherein the pin structure further comprises a hollow cube-shaped receipt box having an open upper part, formed integrally with an upper part of the pin box, provided to penetrate the main body vertically, and having an adhesion protrusion configured to protrude horizontally along an outer circumference of an upper end of the receipt box so as to be adhered to an upper surface of the main body, and a lid detachably inserted into the open upper part of the receipt box.

15. A manufacturing method of an inflatable surfboard, comprising:

cutting drop-stitch fabric, having a plurality of shape maintenance lines provided with both ends coupled to upper and lower inner surfaces of the drop-stitch fabric, into a long plate shape so as to form a main body;

preparing tapes comprising a side tape adhered

to a circumference of the main body by cutting; forming a straight part configured to protrude rectilinearly or to be depressed rectilinearly on a lower surface of the main body by folding an upper surface or the lower surface of the main body; and

adhering the side tape to the circumference of the main body so as to seal the main body and thus to form the main body into an air tube.

16. The manufacturing method according to claim 15, wherein the forming the straight part comprises:

forming a folded part in a concave shape on the upper surface of the main body by folding the main body in a longitudinal direction; and adhering both sides of a lower surface of a V tape to both sides of an upper end of the folded part.

17. The manufacturing method according to claim 15, wherein the forming the straight part comprises:

forming a folded part in a concave shape on the lower surface of the main body by folding the main body in a longitudinal direction; and adhering both sides of a lower surface of a V tape to both sides of an upper end of the folded part.

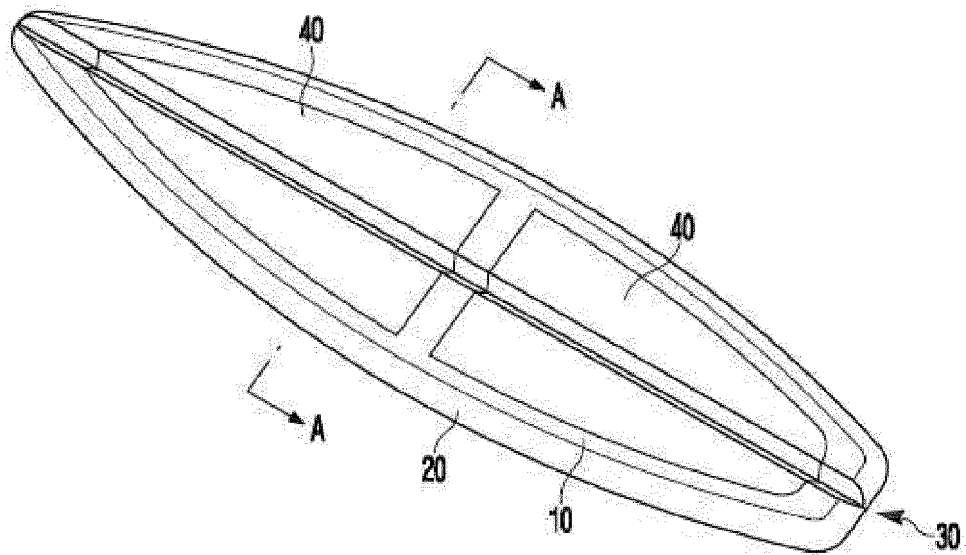
18. The manufacturing method according to claim 15, further comprising:

adhering reinforcing tapes to the upper surface and the lower surface of the main body, respectively, after the forming the straight part.

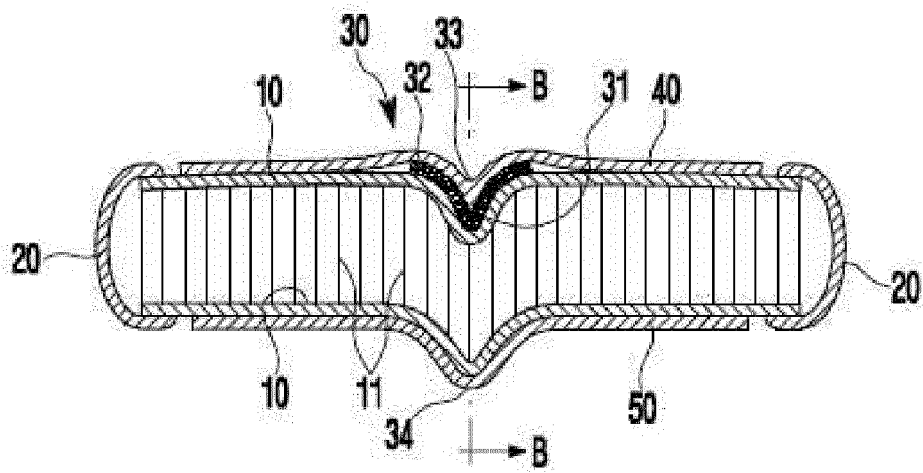
19. The manufacturing method according to claim 18, wherein the adhering the reinforcing tapes to the upper surface and the lower surface of the main body comprises:

adhering pairs of V tapes to the upper surface of the main body so as to form vacant spaces symmetrically disposed at both sides of the upper surface of the main body and configured to form air tubes by injecting air into the vacant spaces, before the reinforcing tapes are adhered to the upper surface and the lower surface of the main body.

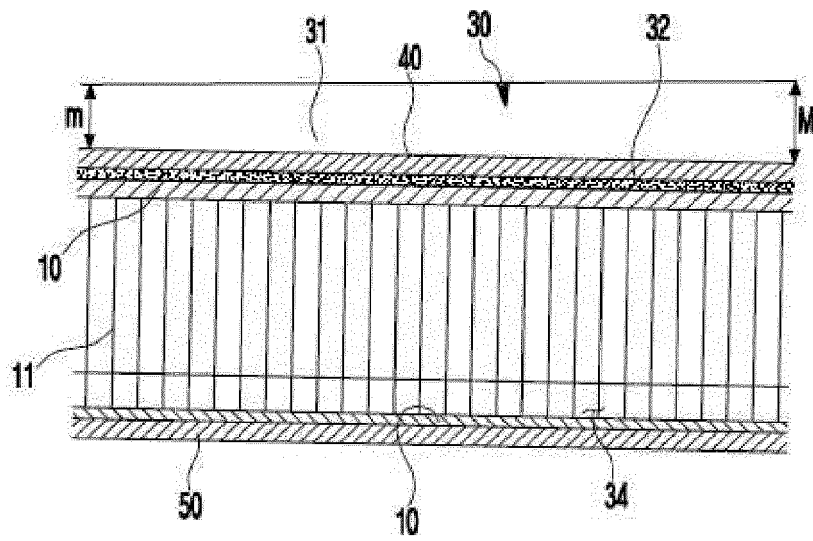
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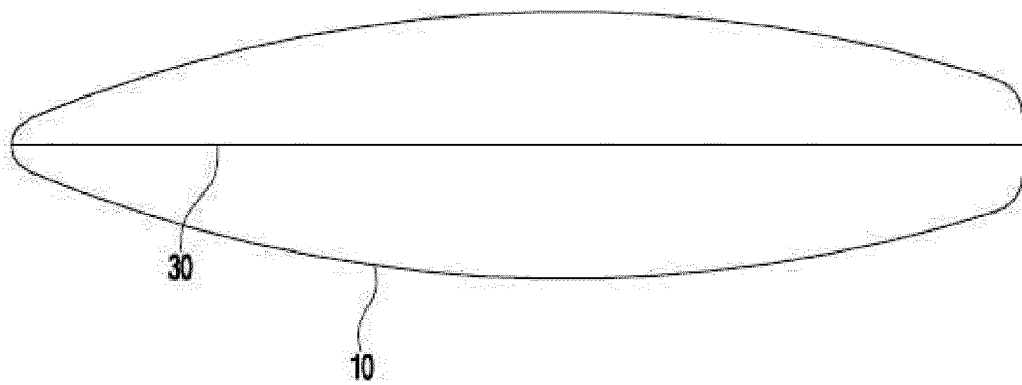
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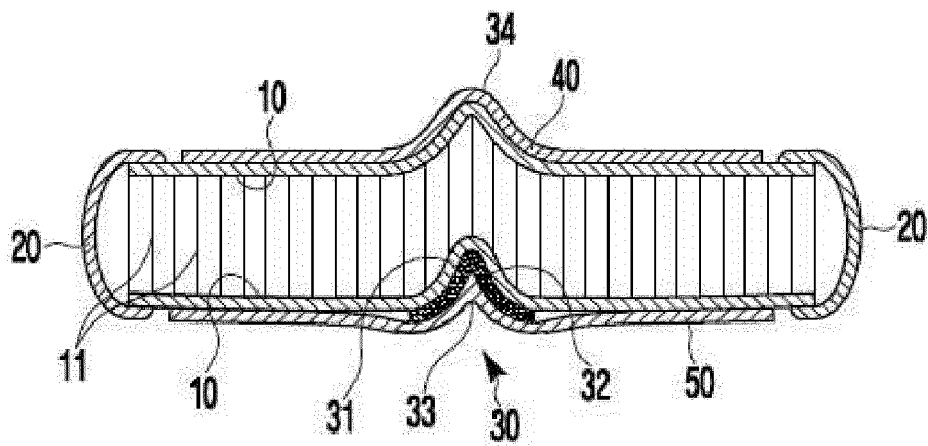
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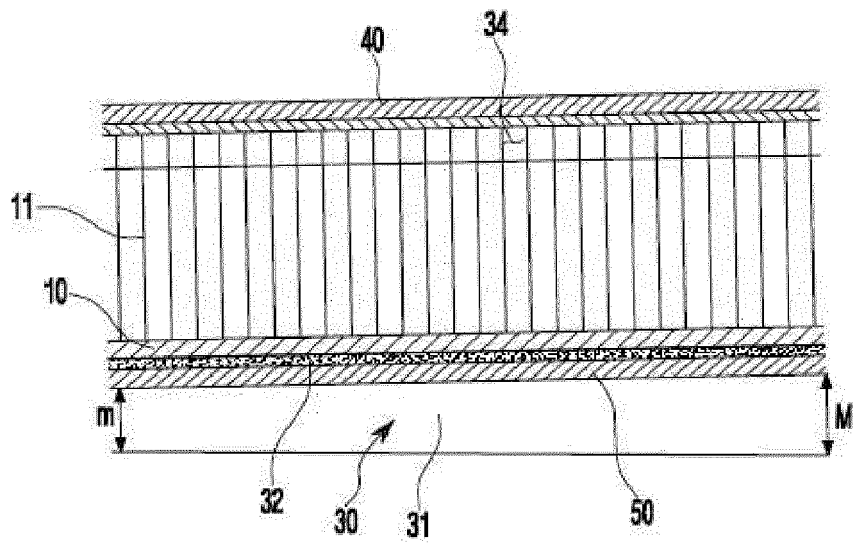
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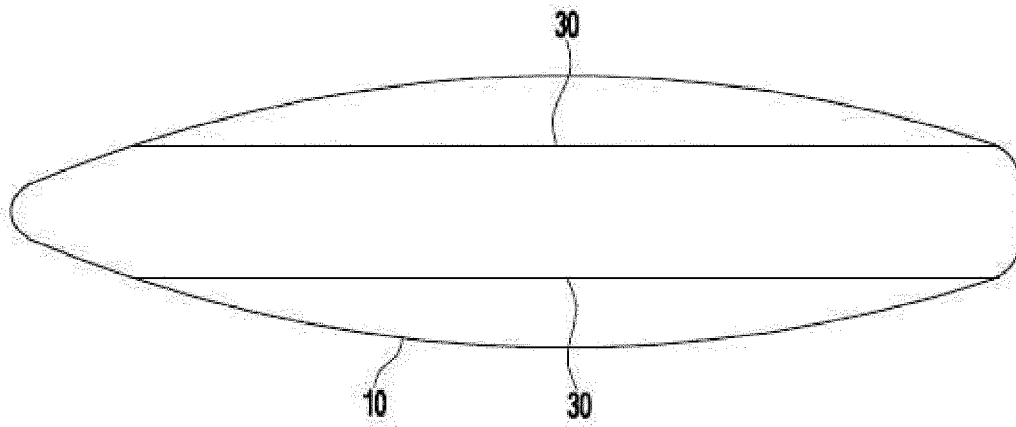
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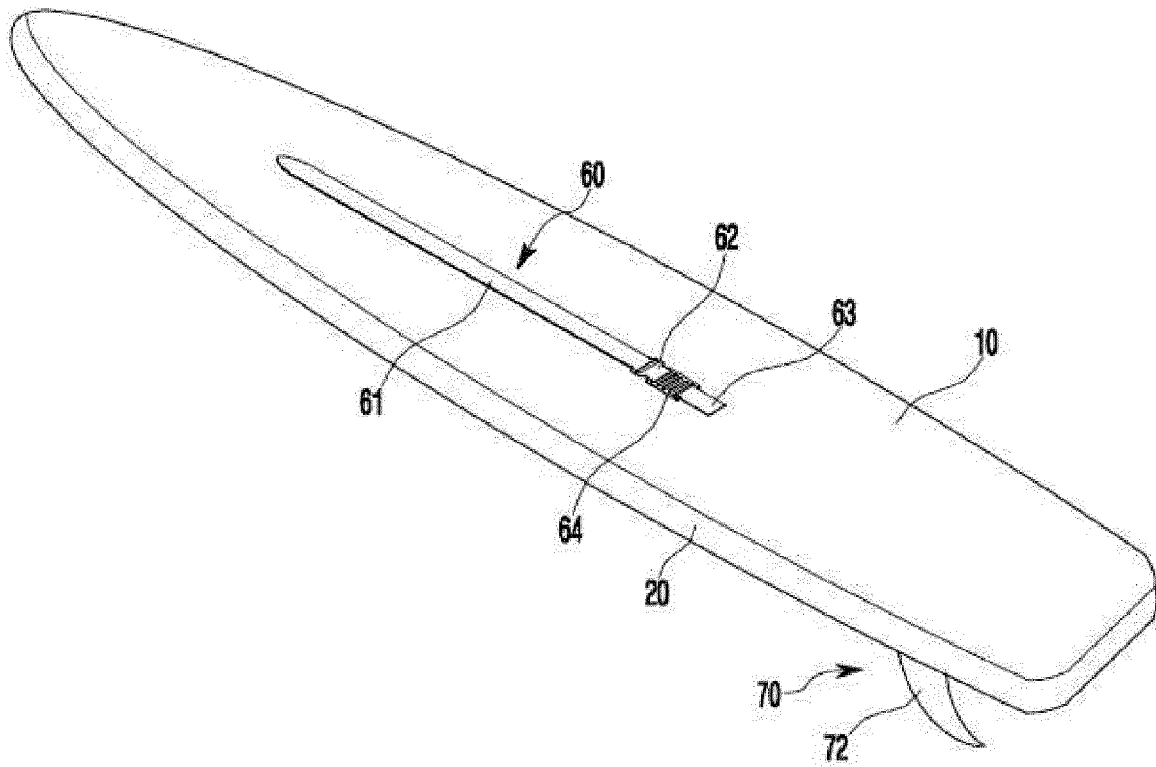
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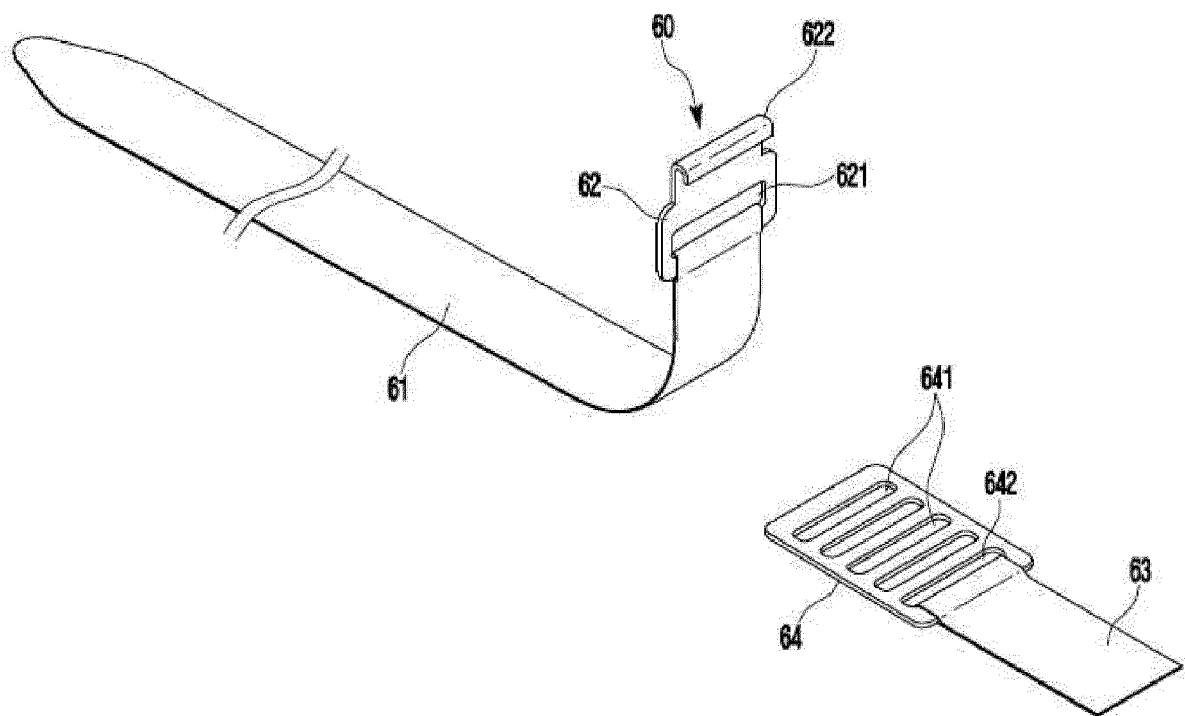
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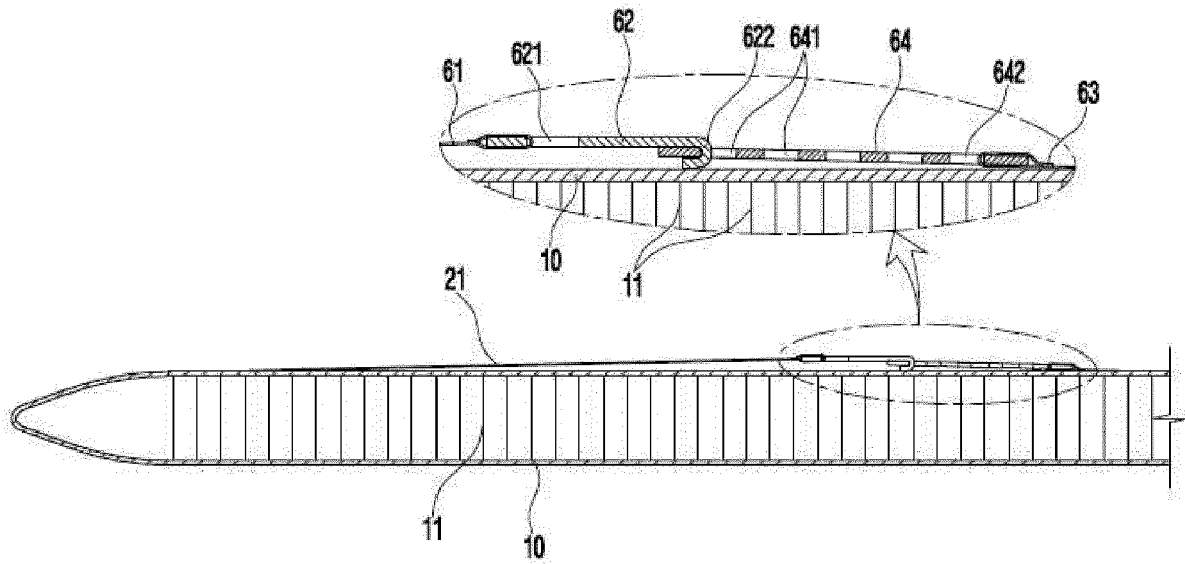
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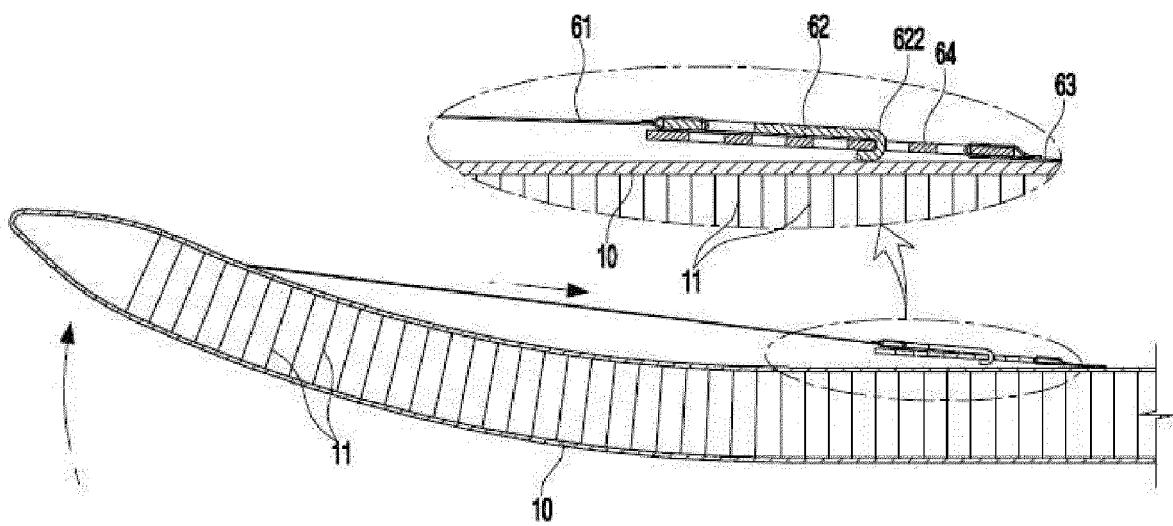
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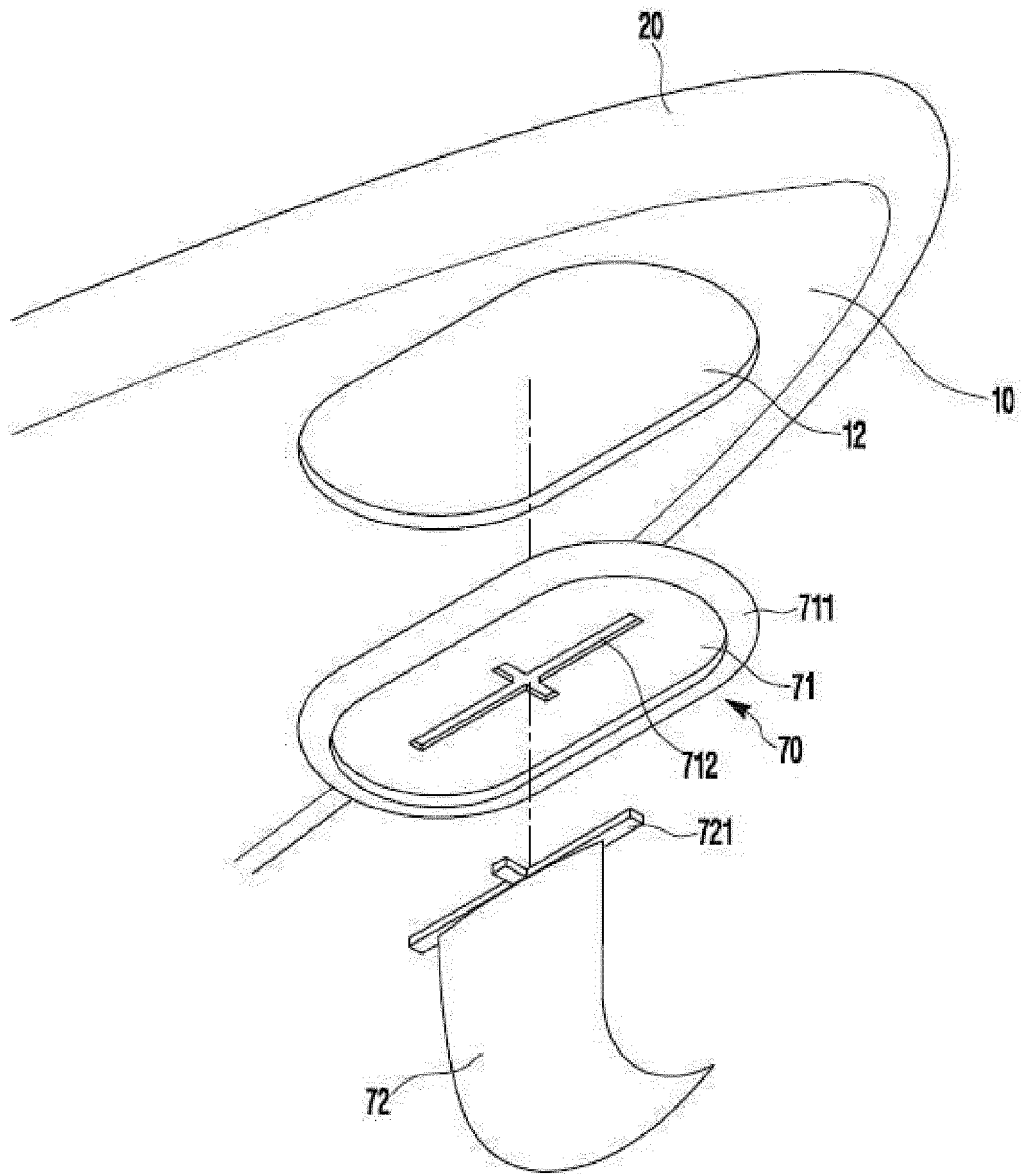
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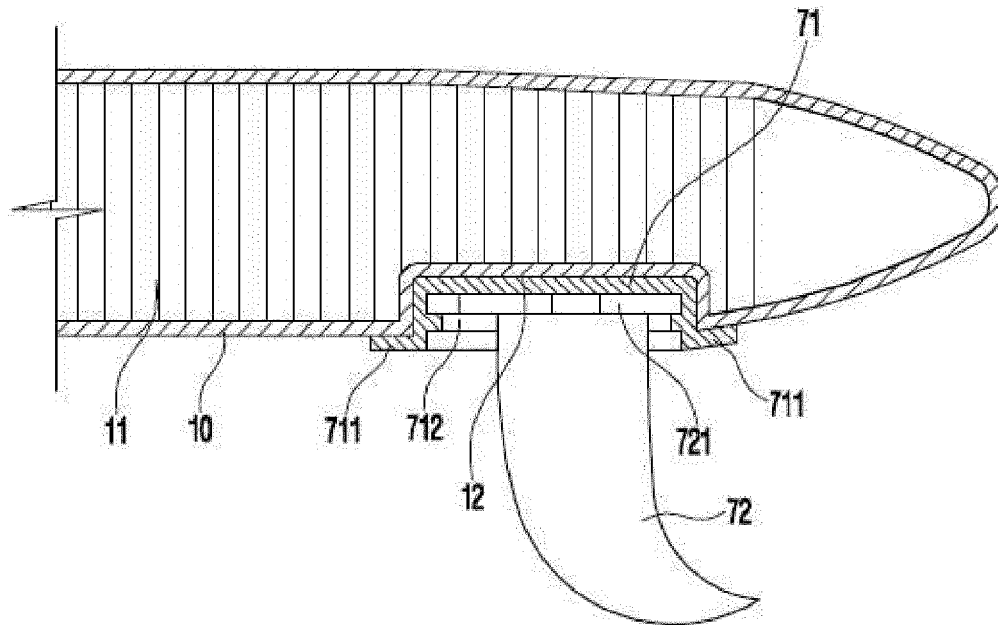
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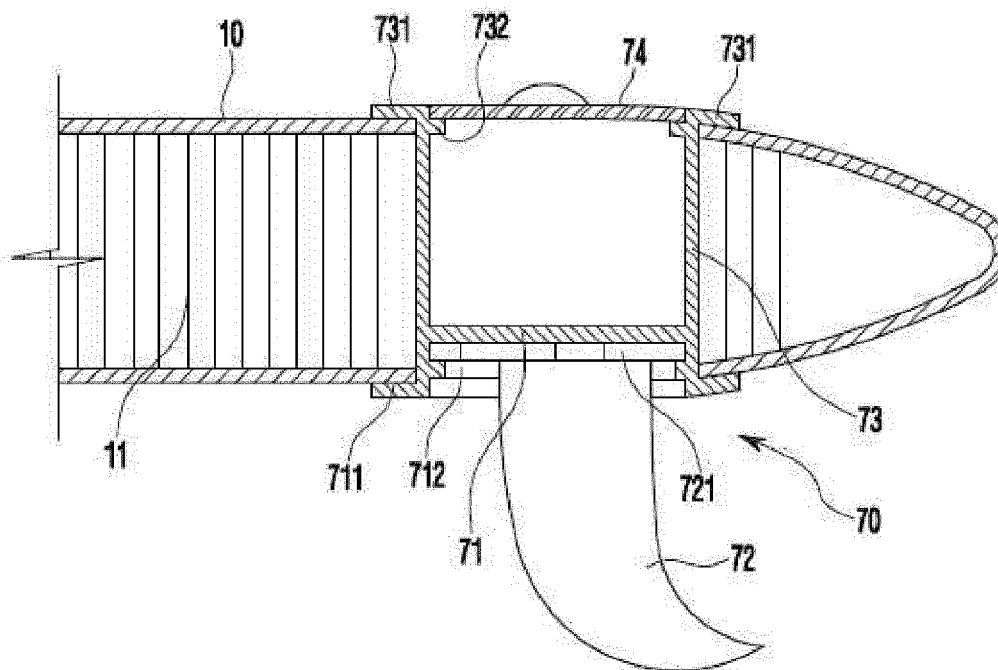
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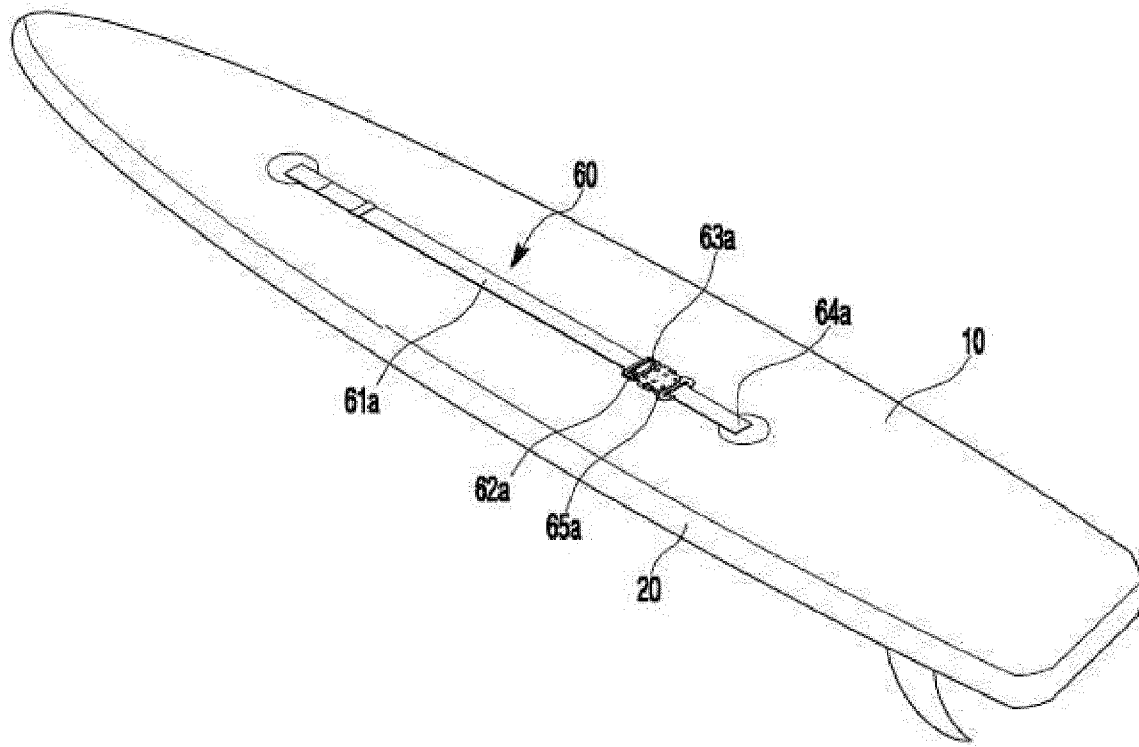
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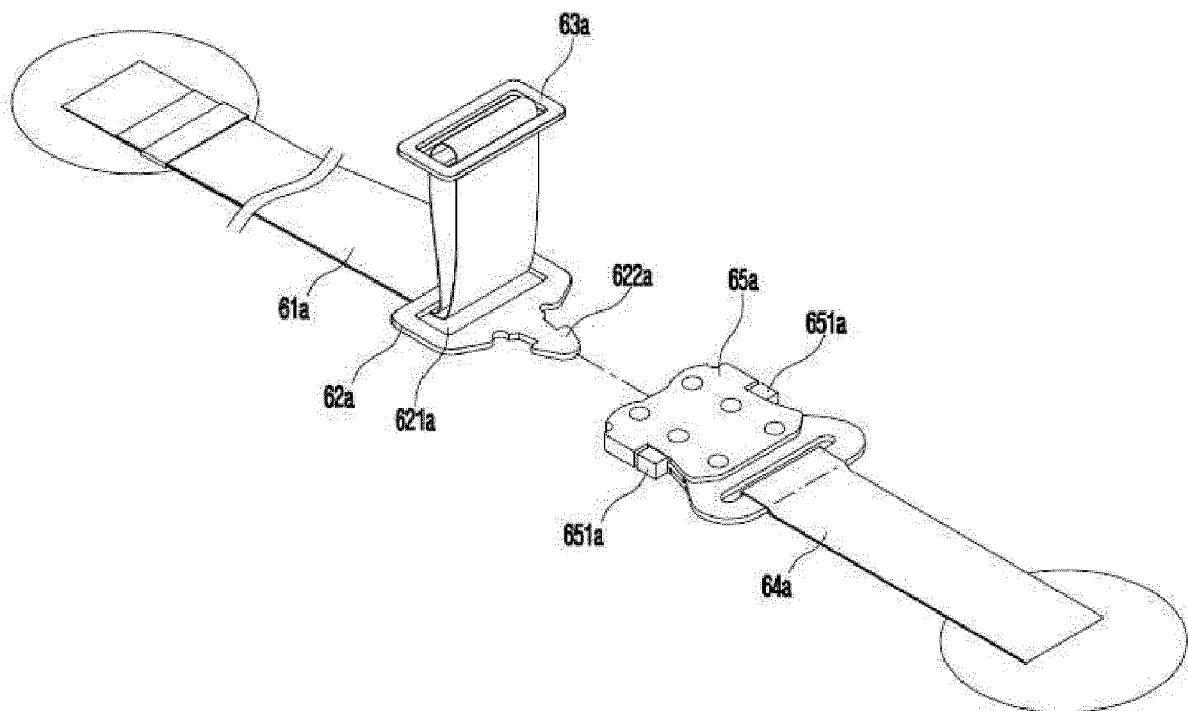
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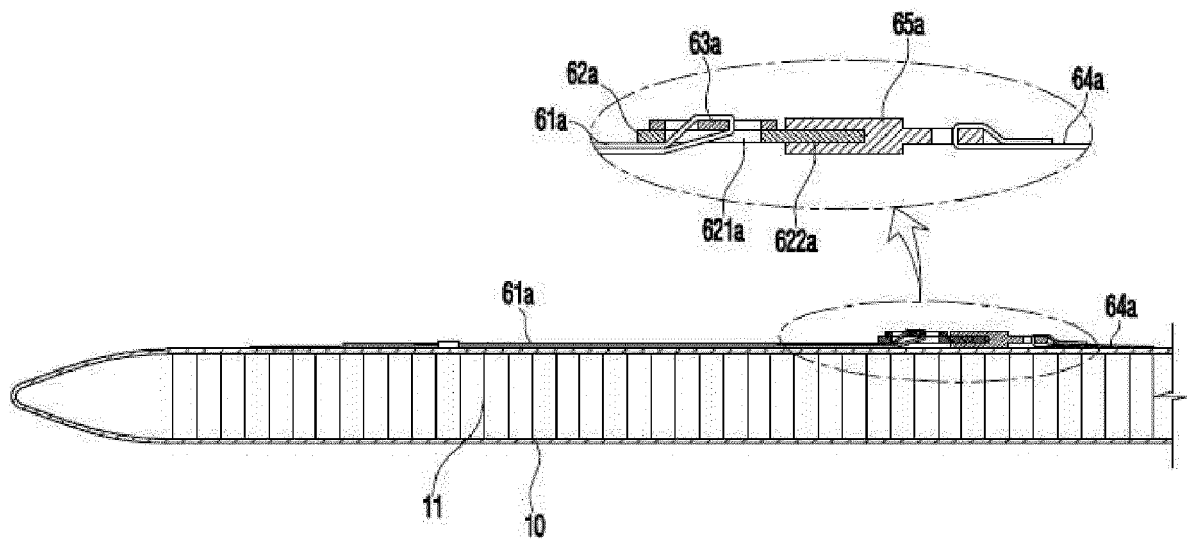
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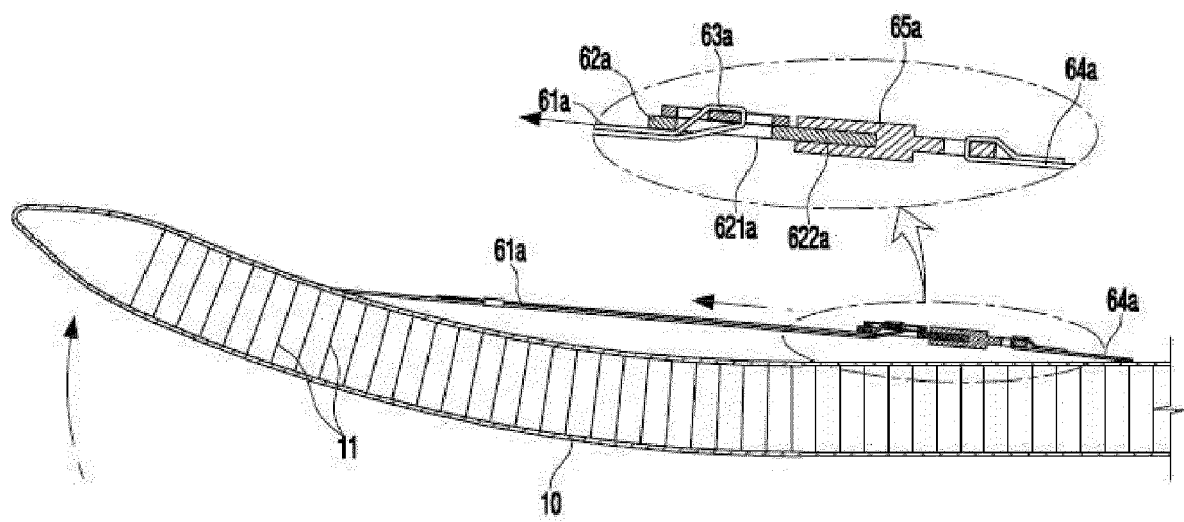
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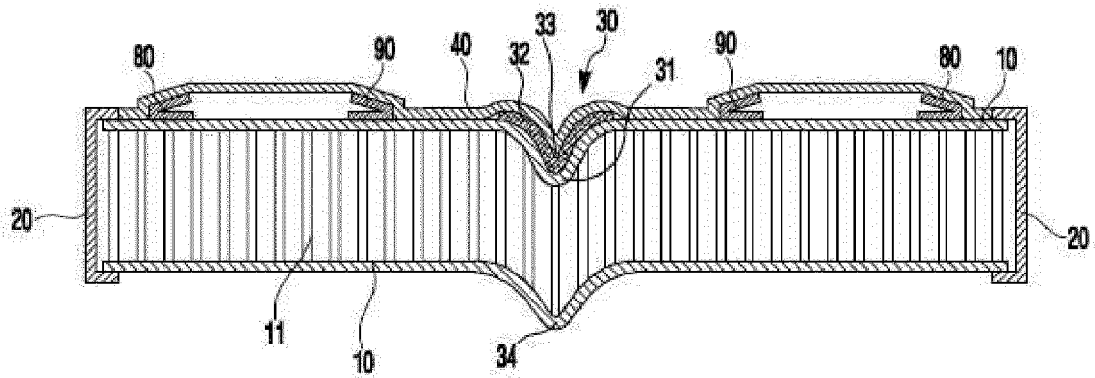
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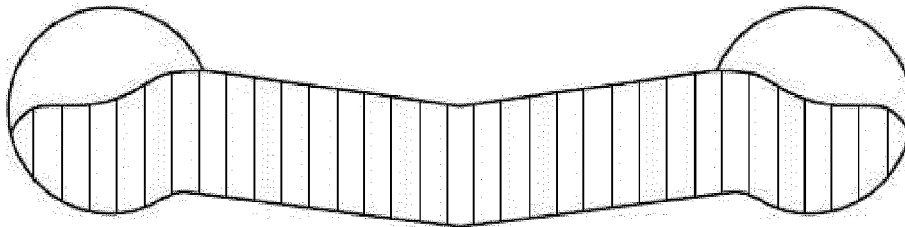
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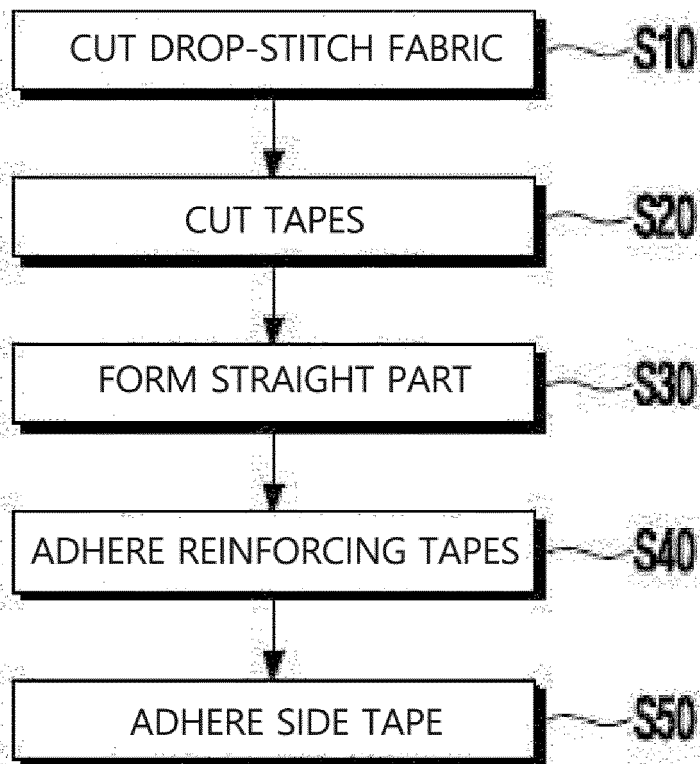
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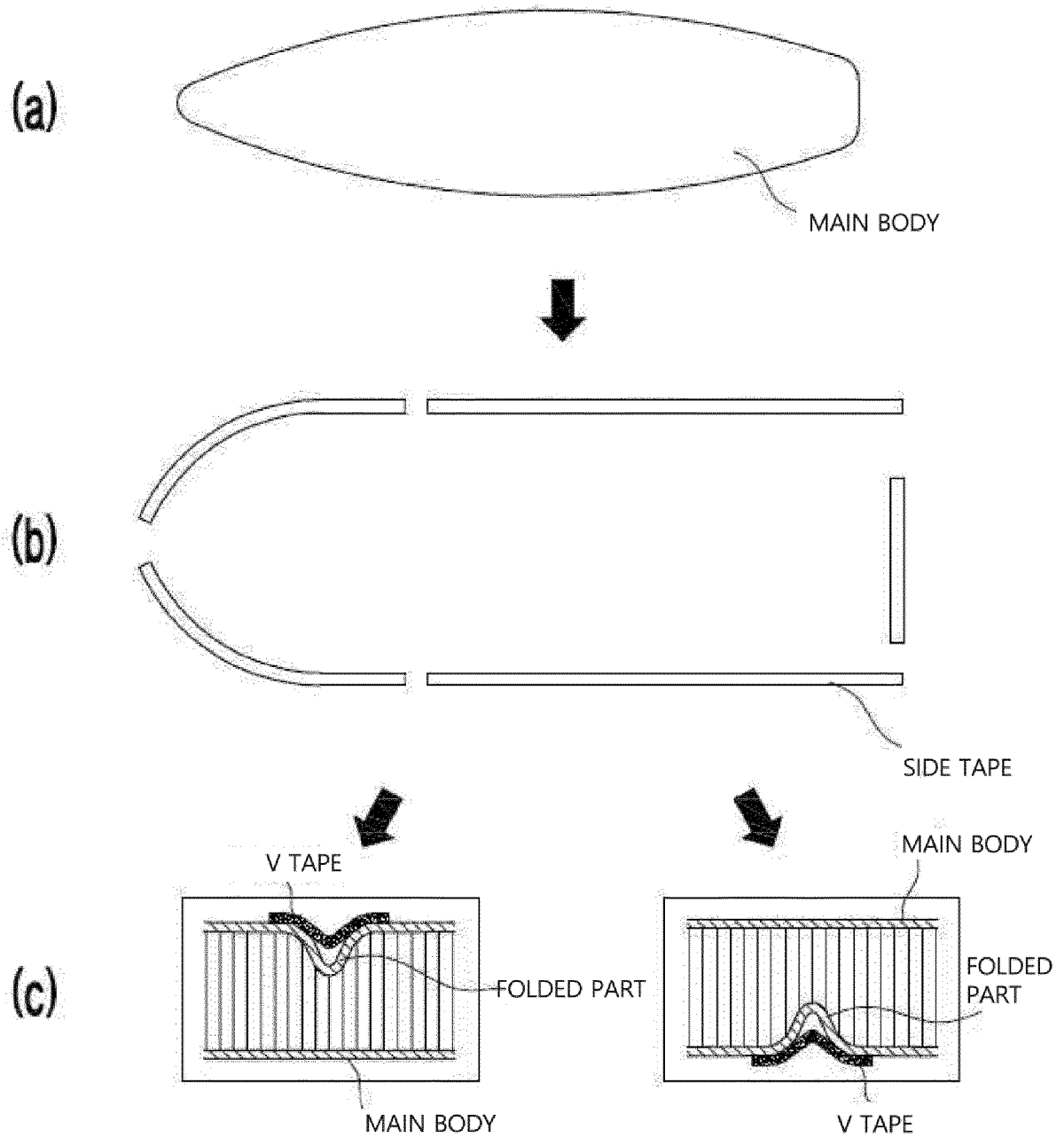
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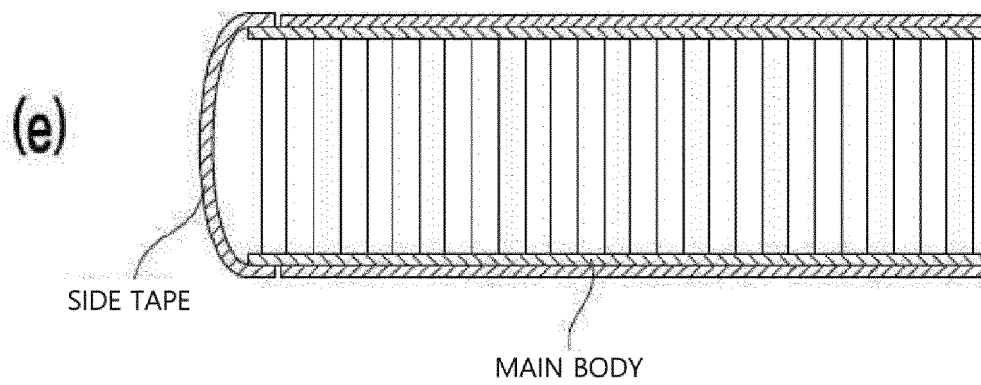
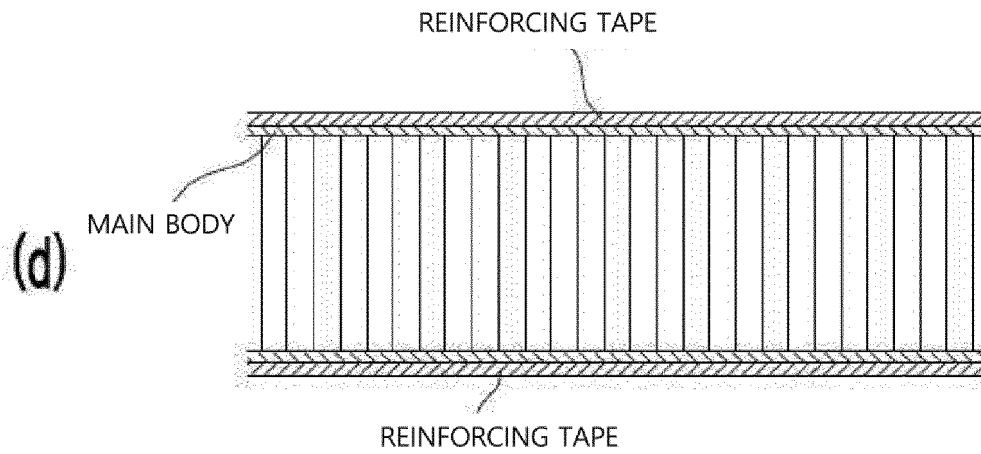
D21



D22



D23



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2021/003968

A. CLASSIFICATION OF SUBJECT MATTER B63B 32/51(2020.01)i; B63B 32/64(2020.01)i; B63B 32/66(2020.01)i; B63B 32/59(2020.01)i According to International Patent Classification (IPC) or to both national classification and IPC																		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) B63B 32/51(2020.01); B32B 27/08(2006.01); B63B 3/38(2006.01); B63B 35/71(2006.01); B63B 35/79(2006.01); B63B 7/08(2006.01) Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models: IPC as above Japanese utility models and applications for utility models: IPC as above Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS (KIPO internal) & keywords: 공기(air), 주입(inject), 서프(surf), 보드(board), 볼록(convex), 오목(concave), 테이프(tape)																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>KR 10-1361081 B1 (WOOSUNG LB CO., LTD.) 11 February 2014 (2014-02-11) See paragraph [0037]; claim 1; and figures 3-5.</td> <td>1-19</td> </tr> <tr> <td>Y</td> <td>JP 2011-225008 A (JOYCRAFT K.K.) 10 November 2011 (2011-11-10) See figures 8-9.</td> <td>1-19</td> </tr> <tr> <td>Y</td> <td>US 4480579 A (MASTERS, William E.) 06 November 1984 (1984-11-06) See column 3, lines 34-41; and figure 2.</td> <td>8-12</td> </tr> <tr> <td>Y</td> <td>US 2012-0103240 A1 (JONES, Cameron Grant) 03 May 2012 (2012-05-03) See figure 1.</td> <td>13-14</td> </tr> <tr> <td>A</td> <td>KR 10-1274578 B1 (WOOSUNG LB CO., LTD.) 13 June 2013 (2013-06-13) See paragraphs [0056]-[0075]; and figures 1-4.</td> <td>1-19</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	KR 10-1361081 B1 (WOOSUNG LB CO., LTD.) 11 February 2014 (2014-02-11) See paragraph [0037]; claim 1; and figures 3-5.	1-19	Y	JP 2011-225008 A (JOYCRAFT K.K.) 10 November 2011 (2011-11-10) See figures 8-9.	1-19	Y	US 4480579 A (MASTERS, William E.) 06 November 1984 (1984-11-06) See column 3, lines 34-41; and figure 2.	8-12	Y	US 2012-0103240 A1 (JONES, Cameron Grant) 03 May 2012 (2012-05-03) See figure 1.	13-14	A	KR 10-1274578 B1 (WOOSUNG LB CO., LTD.) 13 June 2013 (2013-06-13) See paragraphs [0056]-[0075]; and figures 1-4.	1-19
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Y	US 4480579 A (MASTERS, William E.) 06 November 1984 (1984-11-06) See column 3, lines 34-41; and figure 2.	8-12																
Y	US 2012-0103240 A1 (JONES, Cameron Grant) 03 May 2012 (2012-05-03) See figure 1.	13-14																
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.																		
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INTERNATIONAL SEARCH REPORT
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International application No.

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