# CLAIMS

**[0070]** What is claimed is:

1. A drilling jack-up rig comprising:

   i) a flotation hull having a generally flat upper deck;

   ii) an ice-bending portion of said flotation hull extending downwardly from at or near a periphery of said deck and tapering inwardly;

   iii) an optional ice deflecting edge extending generally vertically down from a bottom periphery of said ice-bending portion to direct ice around and not under said flotation hull;

   iv) at least three legs that are positioned within a perimeter of said flotation hull;

   v) a jack-up device associated with each leg to raise and lower each leg; and

   vi) at least two derricks mounted on said deck.

2. The jack-up rig according to claim 1, further including an anchoring mechanism associated with a foot of each leg to provide additional resistance to the forces an ice floe may impose on the rig.

3. The jack-up rig according to claim 1, wherein the ice-bending portion extends vertically at least 11 to 16 meters.

4. The jack-up rig according to claim 3, wherein the angle of the ice-bending hull is in the range of 30 to 60 degrees from the vertical.

5. The jack-up rig according to claim 1, wherein the ice-bending portion comprises a plurality of relatively flat, sloped, segments extending around a periphery of the flotation hull.

6. The jack-up rig according to claim 1, wherein the ice-bending portion is a reinforced

surface.

7. The jack-up rig according to claim 1, wherein the ice-bending portion is a double walled hull surface with reinforcing beams therebetween.

8. The jack-up rig according to claim 1, wherein at least four legs are positioned within said perimeter of said flotation hull.

9. The jack-up rig according to claim 1, wherein two derricks are positioned on the same side of the deck.

10. The jack-up rig according to claim 9, further comprising an accommodation unit mounted at the opposite side of the two derricks on said deck.

11. The jack-up rig according to claim 1, wherein two derricks are positioned at the opposite sides of said deck.

12. A method for drilling in ice prone shallow waters, the method comprising:
    a) providing a jack-up rig having i) a flotation hull having a relatively flat deck at an upper portion thereof and an ice-bending shape along the lower portion thereof where the ice-bending shape extends downwardly and inwardly from the deck, ii) at least three legs that are positioned within a perimeter of the flotation hull, and iii) two derricks mounted on said deck;
    b) jacking down each leg to engage the sea floor and lift the hull out of the water if ice is not threatening the rig;
    c) lowering the flotation hull into the water into an ice defensive configuration so that the ice-bending shape extends above and below the sea surface to break or deflect ice that comes against the rig if ice is threatening the rig; and
    d) drilling from said two derrick during steps b) and/or c).

13. The method of claim 12, further including the step of anchoring the legs to the seafloor to further resist the force of ice floes.

14. The method of claim 12, further comprising the step of raising the flotation hull up out of

the water when the ice threat is reduced.

15. An improved jack-up rig comprising a flotation hull having a flat upper deck and at least three legs that can be lowered through holes in said flotation hull to contact a sea floor, the improvement comprising two derricks on said deck and said flotation hull comprising an ice bending shape that tapers inwardly from said deck so that a bottom of said flotation hull has smaller area than a top of said flotation hull.

16. The improved jack-up rig of claim 15, further comprising a generally vertical edge at a bottom periphery of said ice-bending shape for deflecting ice around said flotation hull.

17. The improved jack-up rig of claim 15, wherein said flotation hull is a double walled hull with reinforcing beams therebetween.

18. The improved jack-up rig of claim 15, wherein said generally vertical edge curves outward at a bottommost edge.

19. The improved jack-up rig of claim 15, wherein said generally vertical edge is outside of said flotation hull.

20. The improved jack-up rig of claim 15, wherein said generally vertical edge is a part of said flotation hull.

What is claimed is:

1. A drilling jack-up rig comprising:

   i) a flotation hull having a generally flat upper deck;

   ii) an ice-bending portion of said flotation hull extending downwardly from at or near a periphery of said deck and tapering inwardly, wherein said ice bending portion has a shape and a strength sufficient to provide ice bending and breaking capabilities against an ice floe;

   iii) an optional ice deflecting edge extending generally vertically down from a bottom periphery of said ice-bending portion to direct ice around and not under said flotation hull;

   iv) at least three legs that are positioned within a perimeter of said flotation hull;

   v) a jack-up device associated with each leg to raise and lower each leg; and

   vi) at least two derricks mounted on said deck;

   wherein said at least two derricks are positioned on the same horizontal side on said deck relative to a first centerline of the deck, and opposite horizontal sides of the deck relative to a second centerline of the deck perpendicular to the first centerline or at the opposite horizontal sides of said deck equidistant from a center of the deck.

2. The jack-up rig according to claim 1, wherein two derricks are positioned on the same horizontal side of the deck.

3. The jack-up rig according to claim 2, further comprising an accommodation unit mounted at the opposite horizontal side of the two derricks on said deck and away from the center of the deck.

4. The jack-up rig according to claim 1, wherein two derricks are positioned at the opposite horizontal sides of said deck.

5. A drilling jack-up rig comprising:

   i) a flotation hull having a generally flat upper deck;

   ii) an ice-bending portion of said flotation hull extending downwardly from at or near a periphery of said deck and tapering inwardly, wherein said ice bending portion has a shape and a strength sufficient to provide ice bending and breaking capabilities against an ice floe;

   iii) an optional ice deflecting edge extending generally vertically down from a bottom periphery of said ice-bending portion to direct ice around and not under said flotation hull;

   iv) at least three legs that are positioned within a perimeter of said flotation hull;

   v) a jack-up device associated with each leg to raise and lower each leg; and

   vi) at least two derricks mounted on said deck,

   wherein the ice-bending portion extends vertically at least 11 to 16 meters, and

   wherein the angle of the ice-bending hull is in the range of 5-10 degrees from the vertical.