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(54) **PROPELLER / TURBINE BLADE POWER CHANNEL**

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(52) **U.S. Cl.**
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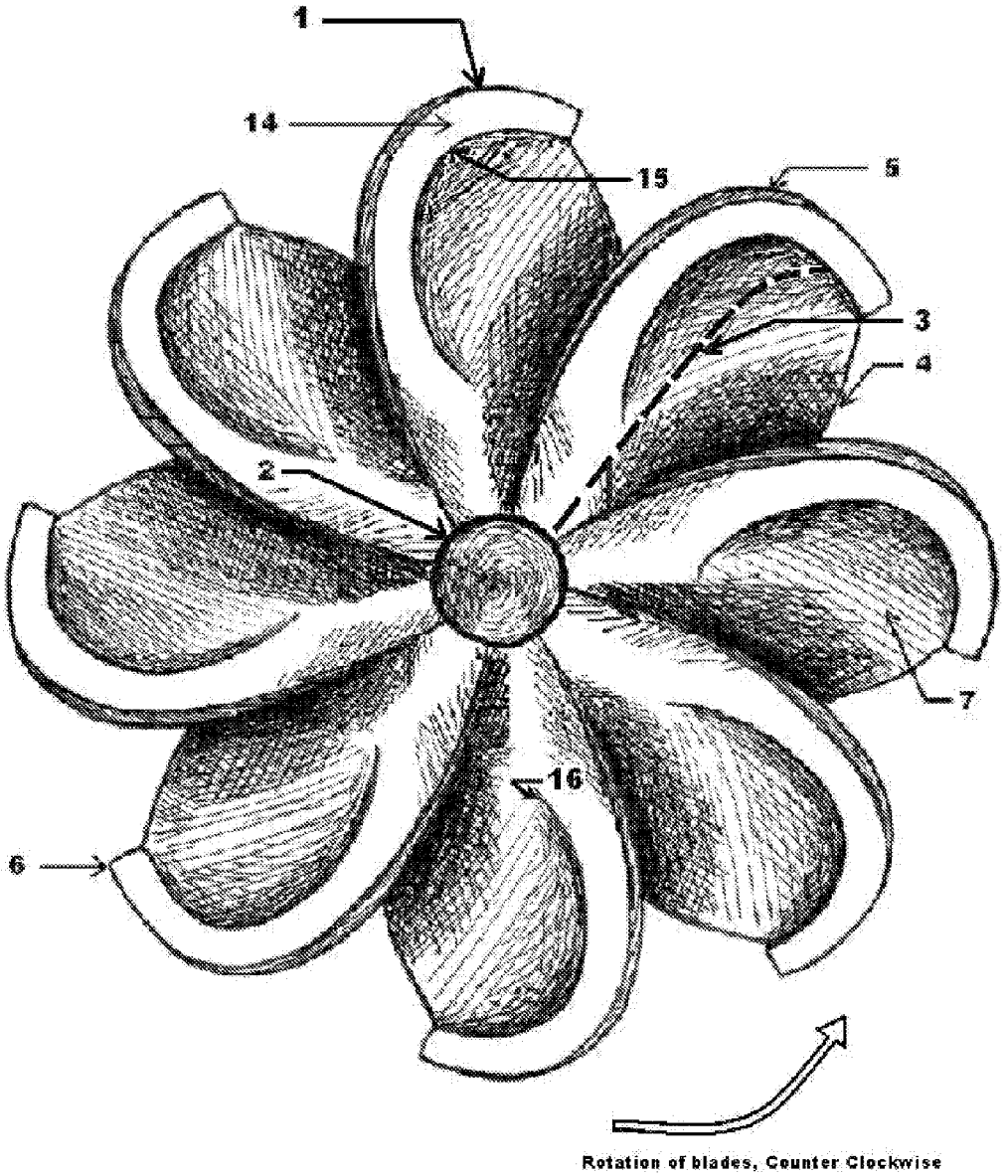
(57) **ABSTRACT**

The disclosed propeller/turbine blade enhancement will be used in the moving fluid kinetic energy conversion field. This power channel blade enhancement will increase the kinetic energy conversion of propeller/turbine blades by collecting, redirecting, channeling, compressing and then expelling a portion of the moving fluid that would otherwise be lost. The power channel's multiple interactions with the moving fluid impacting the blade will produce known fluid hydraulic actions upon the enhanced propeller/turbine blades. These known fluid hydraulic actions will impart more rotational energy to the power channel enhanced blades than previous propeller/turbine blades.



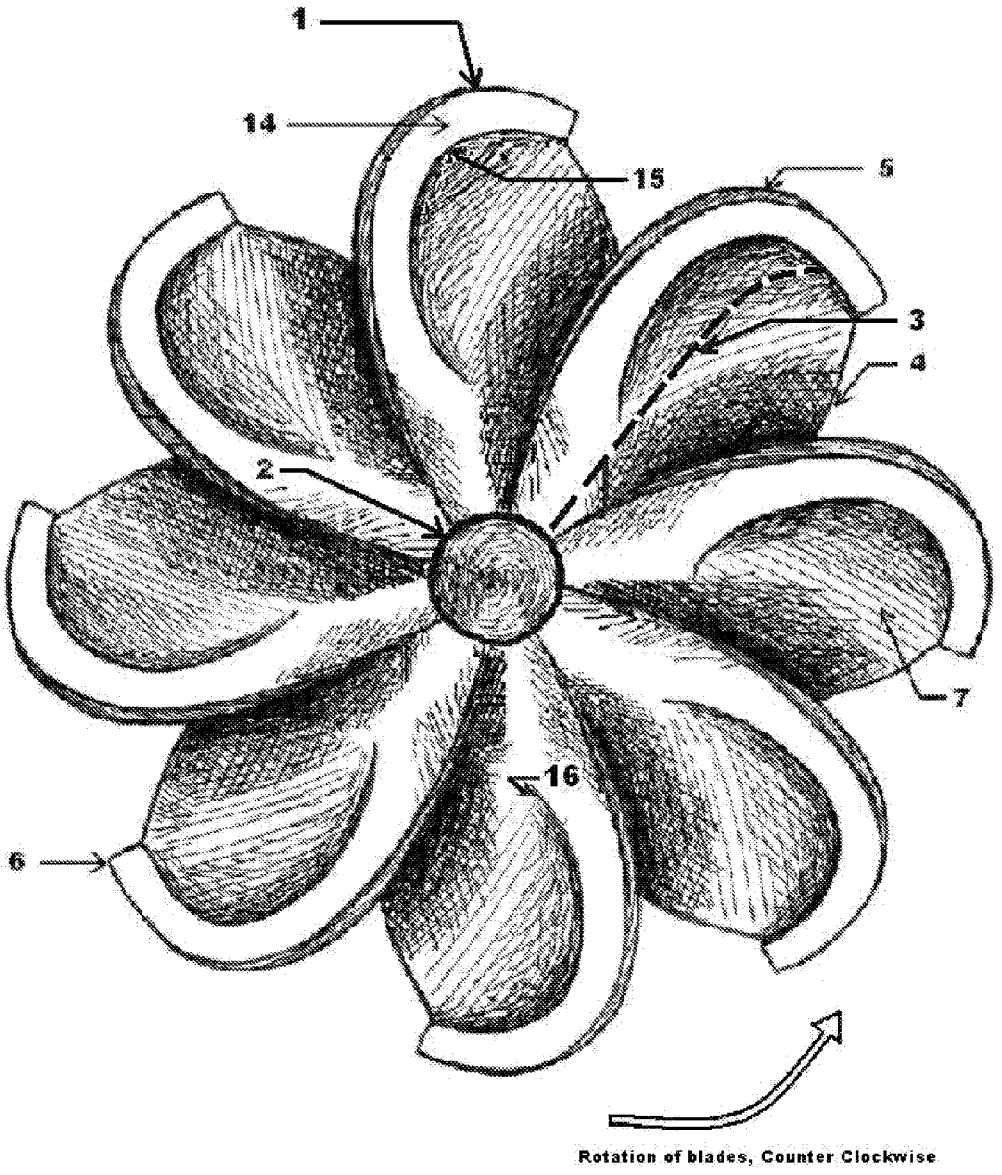


FIG. 1

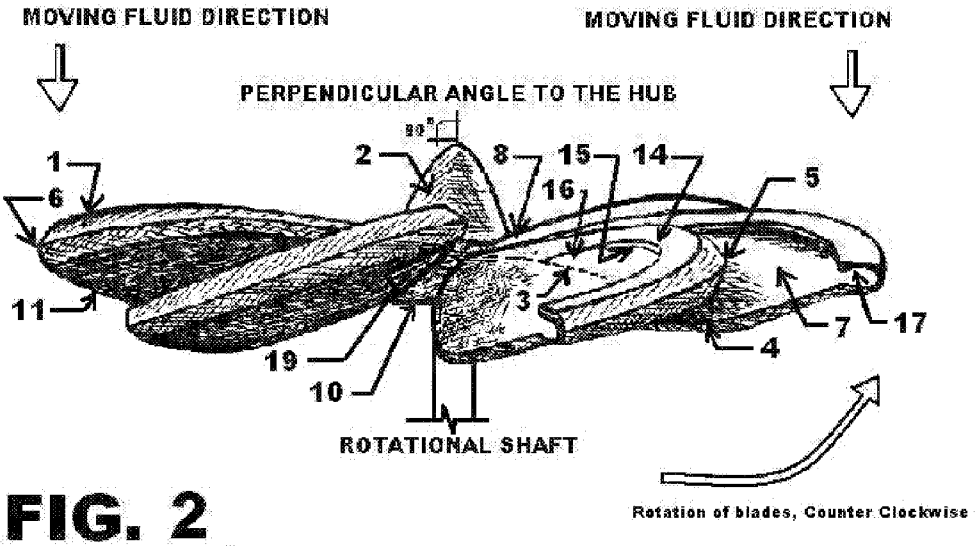

MOVING FLUID DIRECTION
MOVING FLUID DIRECTION
PERPENDICULAR ANGLE TO THE HUB
1
6
2
8
15
14
16
5
11
3
7
17
4
19
10
ROTATIONAL SHAFT
Rotation of blades, Counter Clockwise

FIG. 2

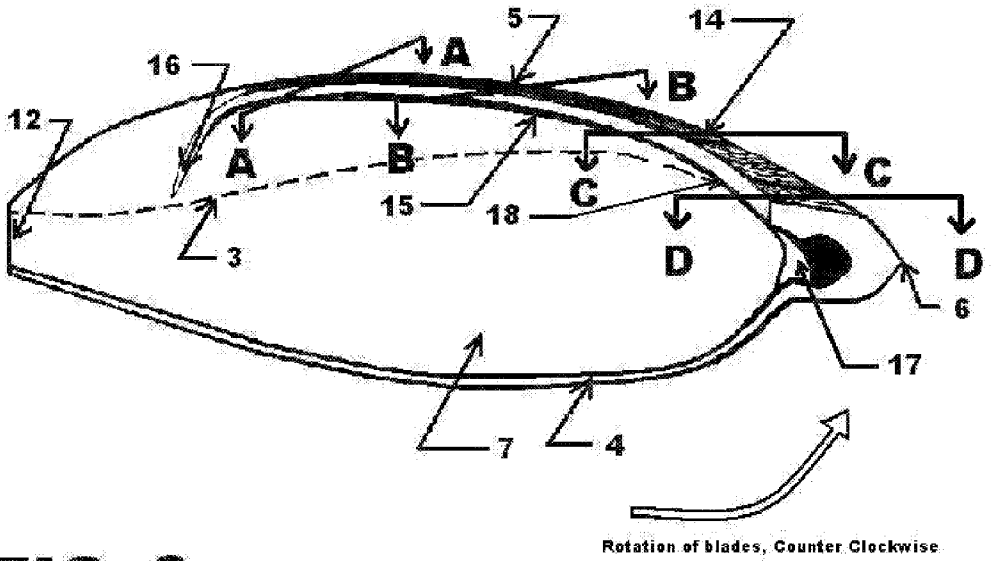

5
14
16
A
B
12
A
B
C
C
15
18
3
D
D
6
17
7
4
Rotation of blades, Counter Clockwise

FIG. 3

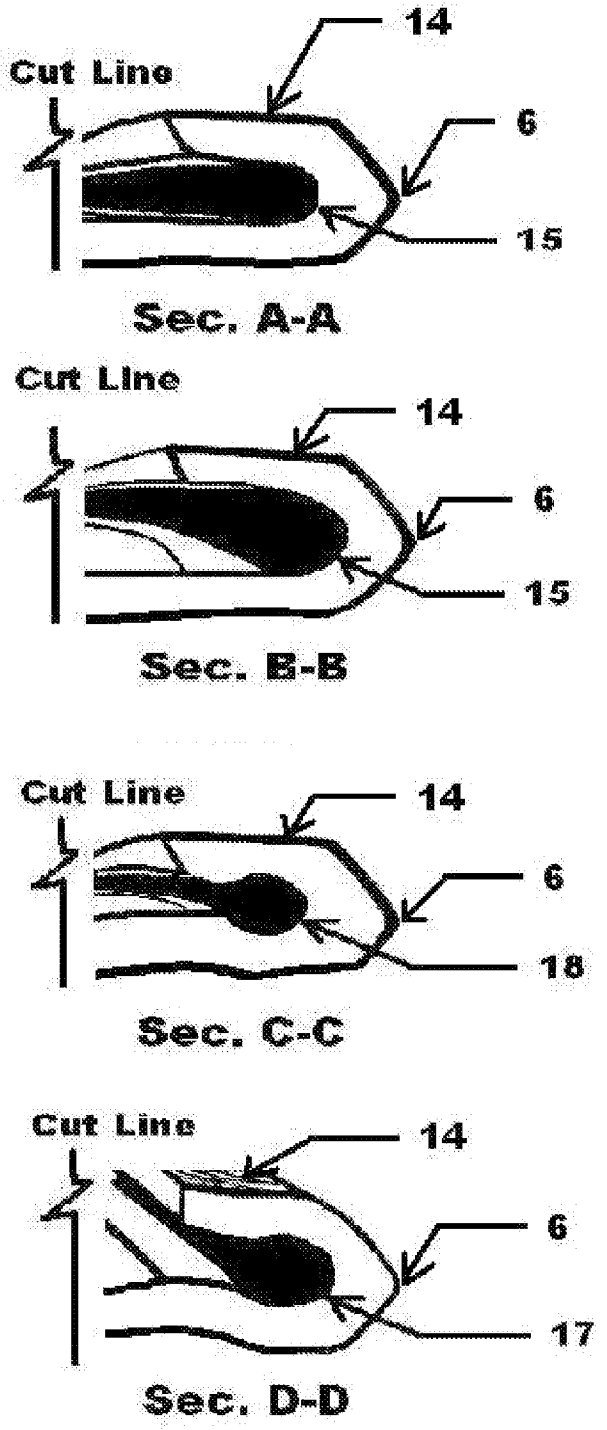

Cut Line
14
6
15
Sec. A-A
Cut Line
14
6
15
Sec. B-B
Cut Line
14
6
18
Sec. C-C
Cut Line
14
6
17
Sec. D-D

FIG. 4

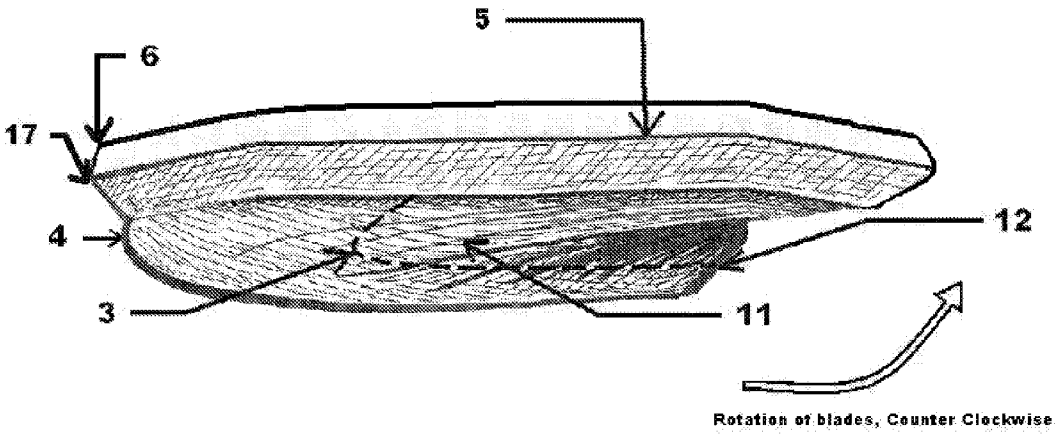
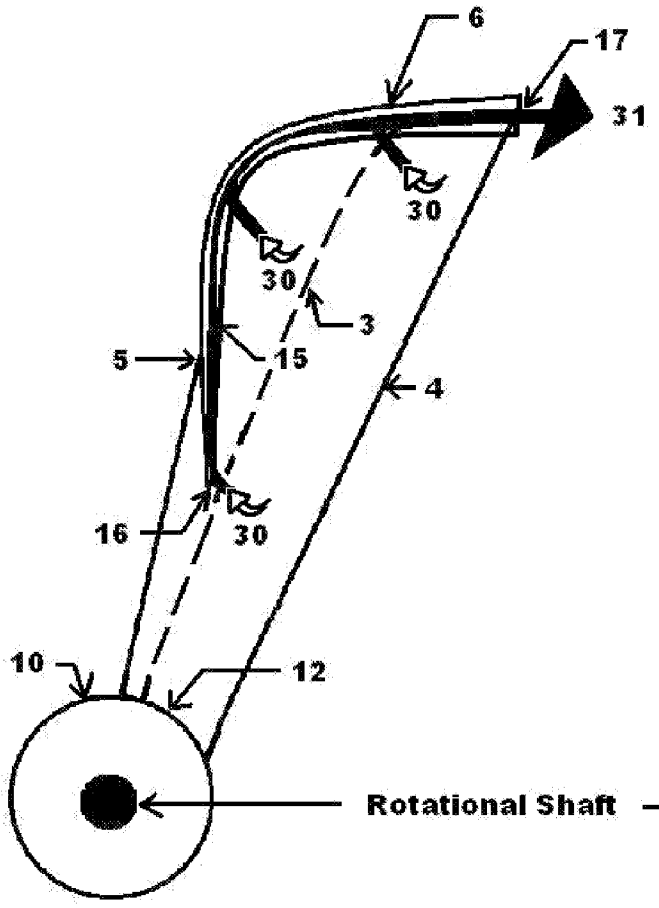


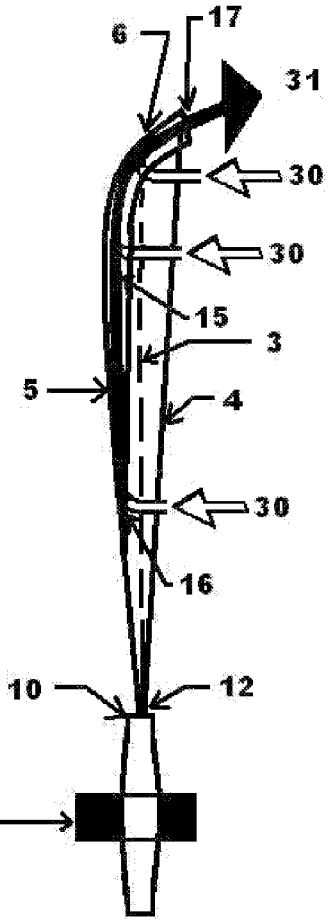
FIG. 5



Front View

Common Turbine Blade with the Power Channel Enhancement

FIG. 6



Side View

Common Turbine Blade with the Power Channel Enhancement

FIG. 7

PROPELLER / TURBINE BLADE POWER CHANNEL

FIELD OF INVENTION

[0001] This propeller/turbine blade Power Channel enhancement will be used in the field of moving fluid kinetic energy conversion. These propeller/turbine blade enhancements will help convert more of the kinetic energy of a moving fluid into mechanical rotational energy.

SUMMARY OF THE INVENTION

[0002] What is needed in the kinetic energy field of moving fluid conversion is a more efficient propeller/turbine blade to convert a moving fluid's inherent kinetic energy into the desired mechanical rotational energy form that can be used to power rotational shaft driven machinery. The rotational shaft driven machines can be any number of types that would include, but not be limited to, electric generators and mechanical pumps.

[0003] The following disclosed propeller/turbine blade enhancement will increase the energy conversion of propeller/turbine blades by contacting and redirecting more of the moving fluid than the prior blades have accomplished in the past. Common propeller/turbine blades up to now have relied primarily on the difference in the positive and negative pressure on the front and back of the blade in order to cause a rotational movement of the bladed array. These common propeller/turbine blades were originally designed to screw or chop their way through a fluid while moving forward driven by their attached motors. These motor driven type blades were first used in modern windmills and then more recently, deployed in the hydrokinetic field of energy production.

[0004] Someone who is familiar with a standard propeller/turbine blade is aware that a portion of the moving fluid contacted by the blade is lost over the front edge of the standard blade. This loss of the fluid over the front edge of the standard blade decreases the energy conversion of the blade. What is needed and disclosed in this enhancement to the standard propeller/turbine blade is a different approach to the problem of fluid loss over the leading of the blade. In the disclosed invention: a power channel will be formed with and or be attached to, the leading edge of the standard propeller/turbine blade. This power channel will mechanically catch and redirect a portion of the moving fluid that would be lost over the front edge of the blade. The moving fluid that is captured and redirected would be constantly forced into the open sided power channel by the following moving fluid that is continuously impacting and pushing the fluid on the frontal surface of the blade upward and outwards during any moment in time. The fluid captured and forced into the power channel would be continually pushed through the power channel by the following moving fluid until it reaches the tip end of the channel. The power channel contains a fluid constricting section that acts on the pushed fluid much like a Venturi tube. The power channel compression section imparts additional velocity to the fluid exiting this portion of the power channel. The velocity enhanced fluid is then expelled from the tip end of the power channel through the power channel exit port. The power channel exit port is designed to direct the fluid away from and counter to the rotating blade, thus increasing the rotational thrust applied to the blade.

[0005] BRIEF DESCRIPTIONS OF THE DRAWINGS

[0006] FIG. **1** is a frontal view of one embodiment of a power channel enhanced set of propeller/turbine blades with a standard nose cone.

[0007] FIG. **2** is a side view of one embodiment of a power channel enhanced set of propeller/turbine blades with a standard nose cone.

[0008] FIG. **3** is a ¾ frontal view of one embodiment of a power channel enhanced propeller/turbine blade that shows the section lines A-A through D-D cut through the power channel portion of the blade.

[0009] FIG. **4** is the combination drawings of the four sections of the power channel enhanced blade taken at the section lines A-A through D-D.

[0010] FIG. **5** is a top view of one embodiment of a power channel enhanced propeller/turbine blade.

[0011] FIG. **6** is the front view of a common propeller/turbine blade with the power channel enhancement added.

[0012] FIG. **7** is the side view of a common propeller/turbine blade with the power channel enhancement added.

DETAILED DESCRIPTION OF THE INVENTION

[0013] FIG. **1** is the frontal view of one embodiment of a power channel enhanced propeller/turbine blade assembly showing the individual **1** blade's features; it's front facing surface **7**, the spine location of the blade **3**, the individual blade's trailing edge **4**, the individual blade's leading edge **5**, each individual blade's tip **6**, the top of the power channel **14**, the inside of the power channel **15**, the start of the power channel **16**, and that this assembly rotates in a counter clockwise manner and has a standard nose cone **2**.

[0014] FIG. **2** is the side view of one embodiment of a power channel enhanced propeller/turbine blade assembly showing the individual **1** blade's features; the spine location of the blade **3**, the blade's trailing edge **4**, the blade's leading edge **5**, the blade's tip **6**, the blade's frontal surface **7**, the blade assembly's hub **10**, the blade's rearward facing surface **11**, the blade's root **12**, the top of the blade's power channel **14**, the inside of the power channel **15**, the start of the power channel **16**, the blade's connection to the assembly hub **19**. This FIG. **2** also shows the orientation into the oncoming moving fluid of the assembly, the location of a rotational shaft, that this assembly rotates in a counter clockwise manner and that this assembly is equipped with a standard nose cone **2**.

[0015] FIG. **3** is the ¾ frontal view of one embodiment of a power channel enhanced individual propeller/blade **1** showing; the spine location of the blade **3**, the blade's trailing edge **4**, the blade's leading edge **5**, the blade's tip **6**, the blade's frontal facing surface **7**, the blade's root **12**, the blade's power channel top **14**, the inside of the power channel **15**, the start of the power channel **16**, the power channel exit port **17**, the approximate location of the power channel compression chamber **18** and the location of sections taken through the power channel at the designated section lines A-A through D-D.

[0016] FIG. **4** represents the detailed cut through sections of the blade at the designated section lines A-A through D-D as the section lines progress around the top of the power channel **14** from the blade's root **12** towards the blade's tip **6**,. These sections show the power channel's internal **15** changing volume and shapes from near the start of the power channel **16** at Sec. A-A, mid way through the power channel's arc Sec. B-B, at the fluid compression section Sec. C-C and the exit port Sec. D-D.

[0017] FIG. **5** shows the top view of one embodiment of a power channel enhanced propeller/turbine blade. As shown; the power channel is part of the leading edge of the blade **5** that runs to the blade's tip **6**, ending at the exit port **17**, which occurs at the upper portion of the blade's trailing edge **4**. The drawing also shows the rearward facing surface of the blade **11**, the blade spine location **3** and that the rotation of this blade is counter clockwise.

[0018] FIG. **6** is the front view of another embodiment of a power channel enhanced propeller/turbine blade **1**. The blade's features are; the blade's frontal facing surface **7**, the blade's spine location along the blade **3**, the blade's trailing edge **4**, the blade's leading edge **5**, the blade's tip **6**, the blade's root **12**, the top of the power channel **14**, the inside of the power channel **15**, the start of the power channel **16**, the power channel exit port **17**, the blade's hub **10**, the blade's relationship with the rotational shaft and the stylized continuous impacting and pushing of the prior fluid still retained on the blade, by the currently arriving moving fluid **30**, with the subsequent redirection of the prior fluid into and through the power channel with the expelled fluid stream **31**.

[0019] FIG. **7** shows the side view of the above FIG. **6** embodiment of a power channel enhanced blade **1** that gives a different look at the stylized depiction of the incoming moving fluid **30** impacting the blade's frontal facing surface and the prior fluid that is still on the blade, and that this action pushes the prior fluid into and through the power channel before exiting at the power channel exit port **17**. The enhanced blade's features shown are; the blade's frontal facing surface **7**, the blade's spine location along the blade **3**, the blade's trailing edge **4**, the blade's leading edge **5**, the blade's tip **6**, the blade's root **12**, the top of the power channel **14**, the inside of the power channel **15**, the start of the power channel **16**, the power channel exit port **17**, the power channel expelled fluid stream **31**, the blade's hub **10** and the blade's relationship with the rotational shaft.

What is claimed is:

1. A propeller/turbine blade enhancement consisting of a Power Channel, in which the power channel mechanically collects and redirects a portion of the moving fluid that the blade interacts with in a kinetic energy conversion environment.

2. The propeller/turbine blade enhancement in claim **1** in which the collection and redirection of moving fluid causes an additional mechanical rotational force to be exerted on the enhanced blade.

3. The propeller/turbine blade enhancement in claim **1** in which; in at least one embodiment, the power channel begins on the frontal surface of the blade, at approximately ¼ of the blade's total length from the root and at approximately the blade's mid blade spine location.

4. The propeller/turbine blade enhancement in claim **1** in which; in at least one embodiment, the power channel starts on the frontal surface of the blade, gradually changes from a ridge of material rising above the frontal facing surface of the blade into a channel that is formed from the converging surfaces near the leading edge of the blade.

5. The propeller/turbine blade enhancement in claim **1** in which; in at least one embodiment, part of the formed power channel runs from the converging surfaces near the leading edge of the blade towards the blade tip.

6. The propeller/turbine blade enhancement in claim **1** in which; in at least one embodiment, part of the power channel is formed by extending the leading edge of the blade horizontally, then folding that extended blade material first upwards, away from the blade's frontal facing surface, and then rearwards, towards the middle of the frontal facing surface, thus forming part of the back and top of the power channel.

7. The propeller/turbine blade enhancement in claim **1** in which; in at least one embodiment, part of the power channel's formed top becomes a part of the leading edge of the blade and is exteriorly contoured for such duty.

8. The propeller/turbine blade enhancement in claim **1** in which at least part of the power channel is constructed by being formed with the blade.

9. The propeller/turbine blade enhancement in claim **1** in which at least part of the power channel may be constructed separately from the blade and then attached to the blade.

10. The propeller/turbine blade enhancement in claim **1** in which the internal shape of the formed power channel can vary in depth, width and breadth.

11. The propeller/turbine blade enhancement in claim **1** in which a section of the power channel towards the end is designed to compress the collected and redirected fluid, much like a venturi tube.

12. The propeller/turbine blade enhancement in claim **1** in which near the upper portion of the trailing edge of the blade the power channel has an exit port that directs and expels the collected fluid.

13. The propeller/turbine blade enhancement in claim **1** in which the power channel may be constructed of various materials, including but not limited to; various types of: woods, metals, fiberglass, carbon fibers, polymers, molded plastics, ceramics and or a combination of these items.

14. The propeller/turbine blade enhancement in claim **1** in which the propeller/turbine blade that is enhanced with the power channel may be constructed of various materials, including but not limited to; various types of: woods, metals, fiberglass, carbon fibers, polymers, molded plastics, ceramics and or a combination of these items.

15. The propeller/turbine blade enhancement in claim **1** in which the propeller/turbine blades that are enhanced with the power channel may be of varied shapes and thicknesses and be comprised of different frontal facing blade contours.

16. The propeller/turbine blade enhancement in claim **1** in which the propeller/turbine blades that are enhanced with the power channel may be of varied shapes and thicknesses and be comprised of different rearward facing blade contours.

17. The propeller/turbine blade enhancement in claim **1** in which the propeller/turbine blades that are enhanced with the power channel may be rotationally twisted about their center axis, from root to tip.

18. The propeller/turbine blade enhancement in claim **1** in which the propeller/turbine blades that are enhanced with the power channel may have their leading edges in front of the power channel.

19. The propeller/turbine blade enhancement in claim **1** in which the propeller/turbine blades that are enhanced with the power channel may have their leading edges behind the power channel.

20. The propeller/turbine blade enhancement in claim **1** in which the propeller/turbine blades that are enhanced with the power channel may rotate either clockwise or counter clockwise and that the power channels; starting points, curves, compression sections, exit ports, etc. would be naturally altered to reflect the rotational direction of the enhanced blades.

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