messenger wire rope from the production vessel through the on-vessel mooring equipment, and out to an anchor handling boat to connect the messenger line to the pre-laid permanent platform chain. The messenger line and associated mooring chain are then drawn into the production vessel.

Summary of Invention

[0005] Embodiments of the present invention relate generally to a method and/or apparatus for hauling in, paying out, guiding, storing, transferring, stabilizing and/or manipulating chains, cables, or ropes. In particular, embodiments of the present invention relate to a method and apparatus for hauling in or paying out mooring chains of different sizes. In one application, the method and apparatus are used to apply rotational power or braking and/or to guide chain lines made out of different chain sizes.

[0005a] According to a first aspect of the present invention, there is provided a chain wheel comprising; a wheel hub; a first outer wildcat profile positioned about the hub; a second outer wildcat profile positioned about the hub in a fixed spaced relation with the first outer wildcat profile; a first inner wildcat profile positioned about the hub and generally adjacent the first outer wildcat profile; and a second inner wildcat profile positioned about the hub in spaced relation with the first inner wildcat profile and generally adjacent the second outer wildcat profile, wherein said first inner wildcat profile and said second inner wildcat profile are configured to receive a chain segment.

[0005b] According to a second aspect of the present invention, there is provided a chain wheel comprising a rim; a first wildcat profile attached to the rim; and a second wildcat profile attached to the ~~forming~~ rim in fixed spaced-apart relation with the first wildcat profile, such that a channel is formed between the first and second wildcat profiles, the channel comprising a groove disposed within the channel, the groove adapted to accommodate a chain segment of first size, and wherein the first and second wildcat profiles are adapted to accommodate a chain segment of a second size.

[0005c] According to ~~a third aspect~~embodiments of the present invention, there is provided a method of hauling in chain comprising the steps of, feeding a chain through a chain wheel adapted for multiple chain sizes; applying rotational power to said chain wheel; and storing chain that has been hauled in.

[0005d] According to ~~a fourth aspect~~embodiments of the present invention, there is provided a method of paying out chain comprising the steps of, paying out chain through a chain wheel adapted for multiple chain sizes; applying braking as required to said chain wheel; and rotatably positioning an inner wildcat profile to accommodate a smaller chain link size.

[0005e] According to a ~~fifth~~ third aspect of the present invention, there is provided a method of manipulating a chain having a plurality of chain segment sizes, said method comprising the steps of: providing a chain wheel having a hub and a pair of drums disposed thereon in fixed spaced parallel relation with one another, each drum having a plurality wildcat profiles for engaging the chain segments; employing a first pair of wildcat profiles to engage chain segments of first size during forward or rearward manipulation of the chain; and employing a second pair of wildcat profiles to engage chain segments of second size during rearward or forward manipulation of the chain.

[0005f] According to a ~~sixth~~ fourth aspect of the present invention, there is provided a chain wheel comprising, a first pocket fixedly shaped to receive and guide a first chain size and guide a second chain size; a second pocket shaped to receive and guide ~~a~~ the second chain size, wherein said second pocket is positioned interior of said first pocket.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG 1 is a front view of a dual pocket chain wheel according to the invention;

[0007] FIG 2 is a side view of the dual pocket chain wheel in FIG 1;

[0008] FIG 3 is a side partial sectional view of an alternative embodiment of a dual pocket chain wheel according to the invention with a groove designed to carry the smaller chain in a "+" (plus) orientation;

[0009] FIG 4 is a front sectional view of a dual pocket chain wheel in FIG 3 with a groove designed to carry a smaller chain in a "+" orientation;

[0010] FIG 5 is a side partial sectional view of another alternative embodiment of a dual pocket chain wheel according to the invention with a groove designed to carry the smaller chain in an "x" orientation; and

CLAIMS

What is claimed:

1. A chain wheel comprising;

a wheel hub;

a first outer wildcat profile positioned about the hub;

a second outer wildcat profile positioned about the hub in a fixed spaced relation with the first outer wildcat profile;

a first inner wildcat profile positioned about the hub and generally adjacent the first outer wildcat profile; and

a second inner wildcat profile positioned about the hub in spaced relation with the first inner wildcat profile and generally adjacent the second outer wildcat profile, wherein said first inner wildcat profile and said second inner wildcat profile are configured to receive a chain segment.

2. The chain wheel of claim 1, wherein the pair of outer wildcat profiles is adapted to engage a first chain segment size and the pair of inner wildcat profiles is adapted to engage a second chain segment size.

3. A chain wheel as in claim 1, wherein each of the wildcat profiles has a plurality of whelps, and wherein pairs of spaced-apart whelps are adapted to position chain segments between pairs of wildcat profiles.

4. A chain wheel as in claim 3, wherein the whelps of the first and second inner wildcat profiles are aligned with respective whelps of the first and second outer wildcat profiles.

5. A chain wheel as in claim 1, wherein each of the inner wildcats profiles ~~is~~ are rotatably adjustable about the hub relative to an outer wildcat.

6. A chain wheel as in claims 1 or 5, further comprising radiused pockets formed between adjacent whelps for accommodating horizontally disposed links.

7. A chain wheel comprising

a rim;

a first wildcat profile attached to the rim; and

a second wildcat profile attached to the ~~forming~~ rim in fixed spaced-apart relation with the first wildcat profile, such that a channel is formed between the first and second wildcat profiles, the channel comprising a groove disposed within the channel, the groove adapted to accommodate a chain segment of first size, and wherein the first and second wildcat profiles are adapted to accommodate a chain segment of a second size.

~~8. A chain wheel as in claim 7, further comprising a groove disposed within the channel, the groove adapted to accommodate a chain segment of first size, and wherein the pairs of wildcat profiles is adapted to accommodate a chain segment of a second size.~~

~~9~~8. A chain wheel as in claim ~~8~~ 7 wherein the groove is radiused, the radiused groove having a diameter less than that of the channel.

~~10~~9. A chain wheel as in claim ~~9~~8, wherein the ~~inner~~ channel is W-shaped.

~~11. A method of hauling in chain comprising the steps of,~~

~~feeding a chain through a chain wheel adapted for multiple chain sizes;~~

~~applying rotational power to said chain wheel; and~~

~~storing chain that has been hauled in.~~

~~12. The method of claim 11 further comprising the step of rotateably positioning an outer wildcat profile to accommodate a larger chain link size.~~

~~13. A method of paying out chain comprising the steps of,~~

~~paying out chain through a chain wheel adapted for multiple chain sizes;~~

~~applying braking as required to said chain wheel; and~~

~~rotatably positioning an inner wildcat profile to accommodate a smaller chain link size.~~

~~14~~10. A method of manipulating a chain having a plurality of chain segment sizes, said method comprising the steps of:

providing a chain wheel having a hub and a pair of drums disposed thereon in fixed spaced parallel relation with one another, each drum having a plurality wildcat profiles for engaging the chain segments;

employing a first pair of wildcat profiles to engage chain segments of first size during forward or rearward manipulation of the chain; and

employing a second pair of wildcat profiles to engage chain segments of second size during rearward or forward manipulation of the chain.

~~15~~11. The method of claim ~~14~~10, wherein the steps of employing a pair of wildcat profiles to engage chain segments drives rearward of forward progress of the chain.

~~16~~12. The method of claim ~~14~~10, wherein the steps of employing a pair of wildcat profiles to engage chain segments guides rearward or forward progress of the chain.

~~17~~13. The method of claim ~~14~~10, wherein the steps of employing a pair of wildcat profiles to engage the chain segments brakes rearward or forward progress of the chain.

~~18~~14. The method of claim ~~14~~10, wherein each drum has an outer wildcat profile and an inner wildcat profile disposed generally adjacent the outer wildcat profile, said method further comprising the step of rotating each of a pair of one of the inner and outer wildcat profiles to accommodate the chain segment of the second size.

~~19~~15. A chain wheel comprising,

a first pocket fixedly shaped to receive and guide a first chain size and guide a second chain size;

a second pocket shaped to receive and guide ~~a~~ the second chain size, wherein said second pocket is positioned interior of said first pocket.

~~20~~16. The chain wheel of claim ~~19~~15, wherein said second pocket includes pocket flats sized to support the second chain size.

~~21~~17. The chain wheel of claim ~~20~~16, wherein said first pocket includes flats sized to support the first chain size.

~~22~~18. The chain wheel of claim ~~21~~17, wherein said first pocket includes whelps sized to fit a first chain size.

~~23~~19. The chain wheel of claim ~~22~~18, wherein the whelps of said first pocket are shaped to guide a chain of a second size into said second pocket.

~~24~~20. The chain wheel of claim ~~23~~19, wherein said second pocket rotates independently of said first pocket.