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United States Patent

Hartman

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[54] TOWING DEVICE

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[52] **U.S. Cl.** .....**114/235 WS**
[51] **Int. Cl.**.....**B63b 21/00**
[58] **Field of Search**.....114/235, 235 WS; 244/3; 188/65, 163; 254/191

[56] **References Cited**

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[57] **ABSTRACT**

A towing device for use behind a boat to tow a pair of water skiers. Pulley apparatus is provided through which a tow rope is provided. Locking means is provided for preventing rotation of the pulley and relative movement between the pulley and the tow rope during initial start up of the water skiers and at other times. Engaging means are provided for engaging the locking means with the pulley and rope when desired. The pulley apparatus is secured to the boat by a swivel which permits rotation of the pulley apparatus relative to the boat. Desirable, biasing means are included to maintain the locking means in a normally nonengaging position.

10 Claims, 4 Drawing Figures

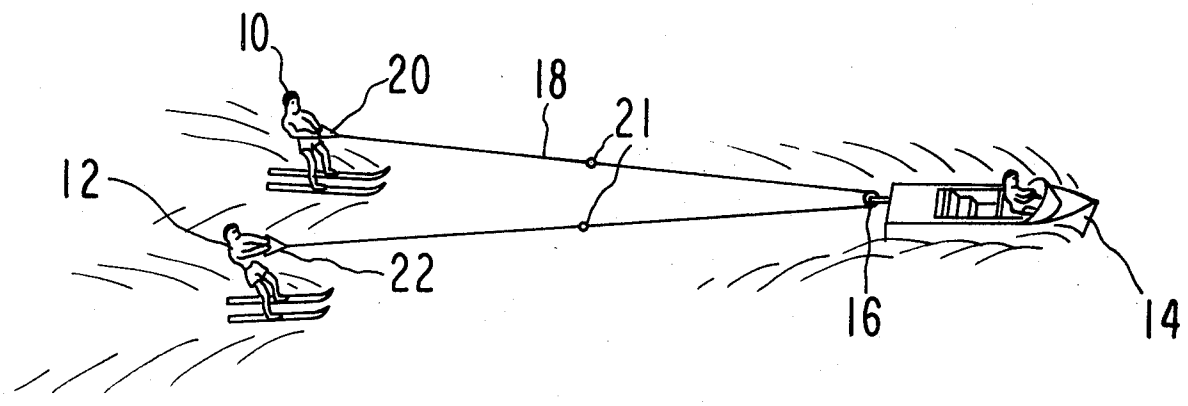


FIG.1

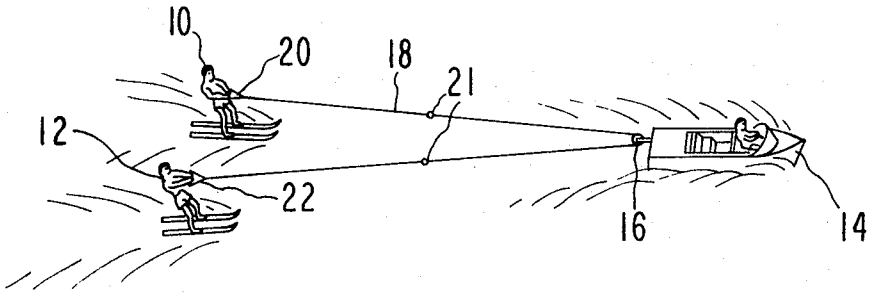
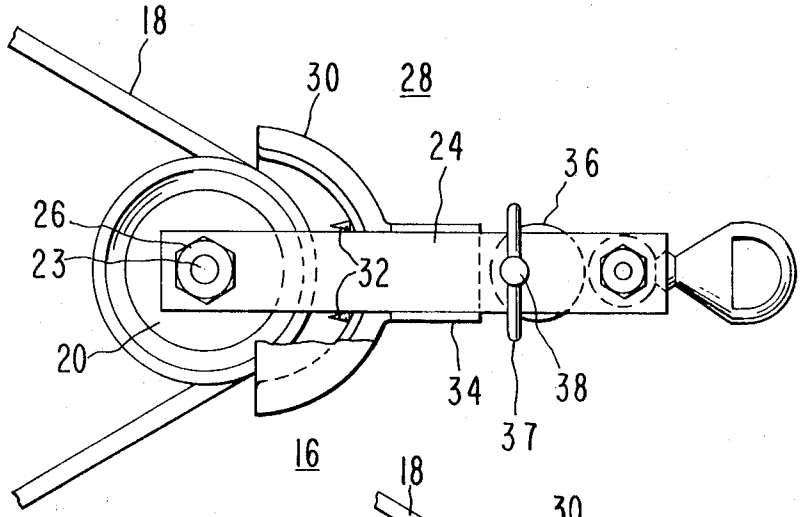


FIG.2



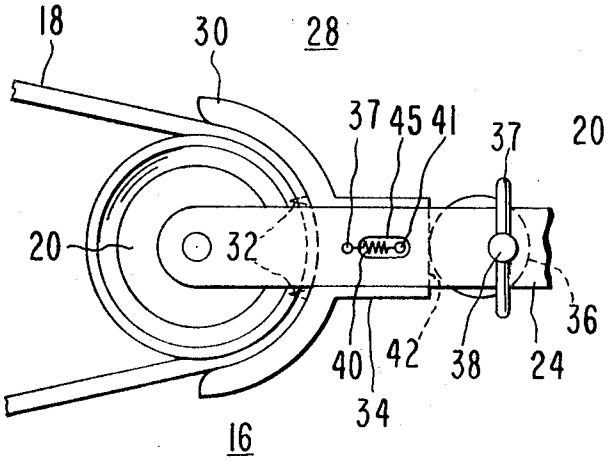


FIG.3

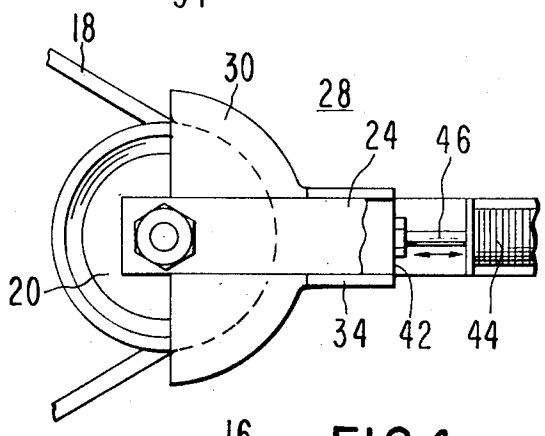


FIG.4

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TOWING DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to a towing device for use behind a boat to pull a pair of water skiers. More particularly, the present invention relates to a towing device for attachment at the stern of a boat having a pulley included therein which may be used to pull a pair of water skiers in a manner to allow them to compete against each other.

Water sports and particularly water skiing have increased in popularity in recent years at an extraordinary rate. Water skiing is enjoyed both by people interested in it as recreational activity as well as by athletes who compete with one another.

Water skiing may be performed in a variety of ways. For example, two or more skiers may be towed behind a boat simultaneously. Or skiers may ski with either one or two skis with any one of a variety of conventional or trick skis upon which they may perform tricks or other skillful maneuvers.

A typical arrangement by which skiers are presently pulled behind boats consists of a harness attached at two points at the stern of the boat. The towrope is attached to the boat by a Y-shaped portion at the opposite end of the rope from the skier. Typically, when two skiers are pulled by the same boat one rope is attached to a point along one side of the stern and the other rope is attached at a point along the other side of the stern. In order for the skiers to cross paths it is necessary to exchange the ends of the towrope or else be faced with the possibility of entangling the towrope lines.

In competitive skiing, skiers are judged against each other on a qualitative basis typically by judges who watch the skiers perform and who give points on the basis of the skillfulness of the execution of a maneuver in view of the relative difficulty thereof. Other competition events include jumping and slalom skiing.

However, none of these events allow a competitor or a recreational skier to compete directly against another skier. Thus, it would be desirable to provide a water skiing event which would enable two contestants to compete directly against each other while skiing at the same time and behind the same boat.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide an improved water skiing towing device;

Another object of the present invention is to provide an improved towing device which permits two skiers to be towed simultaneously behind a boat and in such a manner that they may compete with each other;

It is further an object of the present invention to provide an improved towing device for use in water skiing which allows two skiers being towed behind a boat to interchange positions easily and without entanglement of the towline.

In accordance with the present invention a pulley apparatus is pivotally attached behind a boat suitable for pulling water skiers. A single towrope is passed through the pulley so that two skiers may be pulled, each holding on to one end of the towrope. Locking means is provided for holding the rope relative to the pulley and for preventing rotation of the pulley during the time that the skiers are first pulled from the water and at other times. Engaging means are provided for selectively causing the locking means to engage the towrope and pulley. During normal water skiing conditions the engaging means is in such a position that the locking means is unengaged and the rope moves freely. In one embodiment biasing means is provided to maintain the locking means in a normally nonengaging position.

With this arrangement the towrope is free to move around the pulley wheel depending upon the action of each of the skiers at the ends of the towrope. Each skier may maneuver in such a way as to either maximize or minimize the tension on the line in an effort to cause the other skier to fall. For example, one skier might swing far out past the wake of the boat. At this position there is much tension on the line and the effect would be to pull the other skier towards the boat, as the result of the rotation of the pulley in the direction of the skier outside of the wake. By quickly moving back inside the wake and thereby releasing the pressure the rope will tend to pay out towards the other skier who is then susceptible to a "Spill" unless he can compensate rapidly for the additional line paid out. It may be seen that once one skier falls the other skier is forced to let go of the towrope since he will drop down into the water since no counterbalancing force remains to hold him and pull him through the water, thus minimizing the possibility of the remaining skier overrunning his opponent.

These and other features and advantages will become more apparent upon a study of the following specification taken in conjunction with the accompanying drawings wherein similar characters of reference refer to similar structures in each of the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an illustration of a boat pulling two water skiers and utilizing a towing device according to the present invention;

FIG. 2 is a top view of a towing device according to the present invention partially in section and with the locking means in an unengaged position;

FIG. 3 is a sectional top view of the present invention in the locked position;

FIG. 4 is a top view of another embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, two water skiers 10 and 12 are shown being pulled behind a boat 14 having secured to the stern thereof the towing device 16 in accordance with the present invention. As will be described in more detail subsequently the towing device 16 includes a pulley through which the towrope 18 passes. One skier 10 then holds on to one end 20 of towrope 18 and another skier 12 to the other end 22. Typically, some type of a suitable grip or handle will be attached at each end 20 and 22 to make it easier for the skiers to hold the rope. Since the towrope 18 is free to pass in and out of the pulley 16 the two skiers, depending upon their efforts and skill are free to maneuver in an effort to "dump" the other.

To prevent skiers from being pulled in too near the boat suitable stop members 21 may be secured to each portion of the towrope 18 at a distance corresponding to the minimum safe towing distance behind the boat 14. The stop members 21 must be of sufficient size so that they cannot be passed through the towing device 16.

Additionally, it may be desirable to market the towing device 16 without providing handles 20 and 22. This would permit each skier to use the type of handle which he prefers. In this case each skier would attach his handle and rope to a suitable attachment device, such as a simple plastic, nylon, or metal ring secured to each end of the towrope through towing device 16. The attachment devices would be located in approximately the same positions, and would additionally provide the same function as, stop members 21.

Referring now to FIG. 2, the towing device 16 includes pulley apparatus 18 comprising a pulley wheel 20 having an axis 23 about which pulley wheel 20 rotates. The pulley is rotatably secured to a top plate 24 and bottom plate (FIG. 3) by suitable mounting means such as the bolt 26.

As shown, the towrope 18, which desirably is of nylon or other water-resistant material, is free to pass through the pulley apparatus 18 in either direction depending upon the force exerted at the respective ends of the towrope. towrope

As previously explained, during the initial ascendancy of the skiers from the water onto the surface it is necessary to prevent the pulley apparatus 20 from rotating and also prevent slippage of the towrope 18 on the surface of the wheel 20. This is accomplished by use of locking means 28 which includes a locking shoe 30 for frictionally engaging the towrope 18 and

pulley wheel 20. Desirably, the shape of the locking shoe 30 is such that it uniformly engages the towrope about the circumference of the pulley wheel 20. Teeth 32 are provided along the inside surface of the locking shoe to prevent slippage of the rope 18. The locking shoe 30 includes side members 34 and end surface 42 which is attached between side members 34. The locking shoe 30 is slidably enclosed within the top and bottom plates 24 and 26.

As shown in FIG. 2 the locking shoe 30 is in a nonengaging relationship with the towrope 18. This is the position of the towing device during normal operation while towing skiers. When the skiers are first pulled from the water it is necessary to engage the locking means 28. This is accomplished by providing an offcentered cam 36 which is rotatably secured within the top and bottom plates 24 and 26. A handle 37 attached to a shaft 38 is manually operated to rotate the cam 36. To engage the locking means 28 the cam 36 is rotated 180° to the position shown in FIG. 3. In this position the member 34 of the locking means 28 is engaged by the cam 36 so as to force the locking shoe portion 30 in a frictional contact with the rope 18 and the pulley wheel 20. It may also be seen in FIG. 3 that the teeth 32 pierce the towrope 18 and prevent relative motion between the rope 18 and the pulley wheel 20.

As shown in FIG. 3 a tension spring 40 may be provided to bias the shoe portion 30 in a normally nonengaging relationship with the towrope 18 whenever the cam 36 is in the position of that shown in FIG. 2. The spring 40 is secured to the member 34 of the locking means 28, for example, by securing the end of spring 40 to a pin member 37 which is secured to side members 34. The opposite end of the spring 40 is attached to a pin member 41 which is secured between the upper and lower mounting bars 24 and 26.

Spring 40 is shown in the extended position in FIG. 3. Whenever the cam 36 is rotated from the position of FIG. 3 the force exerted by the spring will cause the locking shoe 3 to move in a direction away from the pulley wheel 20. A slot 45 is provided in each of the side members 34 to allow the locking shoe 30 to pass by pin member 41 when moving between locked and unlocked positions.

The use of the cam 36 for engaging the locking means 28 is only illustrative. FIG. 4 shows an example of another means by which the locking means 18 may be engaged with the wheel 20 and the rope 18. A solenoid coil 44 is secured between the plate members 24 and 26. The solenoid includes a core or armature portion 46. The armature 46 is arranged within the solenoid coil 44 such that when the solenoid 44 is electrically energized the armature 46 is driven against the end surface 42 of the portion 34 of the locking shoe 30. This causes engagement of the shoe 30 and teeth 32 with the rope 18.

Once the skiers are out of the water, the locking shoe 30 may be disengaged from the towrope 18 and pulley wheel 20 in a number of ways. For example, the solenoid 44 may be oppositely polarized by interchanging the potential across it, thereby causing the armature 46 to be withdrawn back into the core of the solenoid 44. Alternately, the coil may be deenergized and a biasing arrangement may be provided, such as the spring bias 40 shown in FIG. 3 to force the shoe 30 from the rope 38 and pulley wheel 20.

Likewise, the use of a brakeshoe 30 to comprise the locking means 28 is only illustrative. Other locking means may be used to accomplish the same purpose. For example, a disc locking arrangement may be used whereby axial frictional contact is made by brake pads with the surfaces of the pulley wheel 20. Also a drum locking arrangement, analogous to the arrangement in common automobile braking systems, os suitable.

With the aforesaid arrangement it is thereby possible to pull two water skiers simultaneously and in a manner that they may compete with each other in an attempt to force the other one to let go of the towrope or fall from his skis, and also provides an arrangement whereby the skiers may interchange their positions without exchanging towropes or without causing the towropes to be entangled merely by switching positions relative to the boat and allowing the swivel to rotate to a new position.

Additionally, by engaging the locking means with more rope out on one side of the pulley than the other it may be seen that the skiers are free to cross past each other and exchange positions relative to the boat. This is particularly advantageous where two skiers are performing skillful maneuvers and they must exchange positions frequently. This eliminates the necessity of requiring two separate towropes of different lengths as is now required to perform such maneuvers.

Although the foregoing invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention as limited only by the scope of the appended claims.

I claim:

1. A towing device for attachment to a boat for use in pulling a pair of water skiers behind said boat comprising:
   a. a towrope including at each end thereof means for water skiers to manually grip the same;
   b. pulley apparatus including a pulley wheel for passing the tow towrope therethrough, said pulley apparatus comprising towrope;
      i. means for locking said tow rope so as to prevent said two rope from being payed out in either direction relative to said pulley wheel regardless of the relative drag caused by the water skiers at their respective ends of said tow rope;
      ii. means for engaging said locking means; and
   c. means for attaching said pulley apparatus to said boat.

2. A towing device as in claim 1 wherein said locking means comprises a brakeshoe for frictionally engaging said towrope.

3. A towing device as in claim 2 wherein said locking means additionally includes biasing means for maintaining said brakeshoe in a normally nonengaging position.

4. A towing device as in claim 1 wherein said locking means additionally includes rope gripping members.

5. A towing device as in claim 3 wherein said brakeshoe includes generally pointed engaging teeth attached along the rope engaging portion thereof.

6. A towing device as in claim 4 wherein said locking means additionally includes biasing means for maintaining said brakeshoe in a normally nonengaging position.

7. A towing device as in claim 1 wherein said engaging means comprises an offcentered cam and means for rotating said cam into and out of engagement with said locking means.

8. A towing device as in claim 1 wherein said engaging means comprises an electrically energized solenoid having an armature engageable with said locking means.

9. A towing device as in claim 8 including biasing means for maintaining said locking means in a normally nonengaging position.

10. A towing device as in claim 1 wherein said attaching means comprises a swivel capable of allowing unlimited rotation of the remainder of said towing device relative to the boat.

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