The overboard drive mechanism for boats propulsion and maneuverability on water of the present invention, is manually, solar, and engine powered. The device when connected to the manual system (cycling means), is designed for single cycling and double cycling system. The device also is designed with double gearbox, overboard gearbox and aero gearbox or submersible gearbox which rotates in the overboard gearbox to turn the boat while the propeller is running in water. The maximum rotation of the submersible gearbox/rudder is 360 degrees. The device is portable and is also designed to propel the boat on water by rotating the propeller up in the Air on a high speed. The device can also be used to propel the boat forward and backwards using only steering wheel without reverse gear. The principle use of the present invention is for boat racing, transport, patrol, leisure, rescue during floods and environmental purposes.
DESCRIPTION

Background of the Invention

Field of the Invention

The present Invention of the Overboard Drive Mechanism, relates to propulsion and maneuverability of boats on water.

Description of the Prior Art

The present invention of the Overboard Drive Mechanism, is not known to me in the prior art. The only cycling boat known to me that transmit motion from the power wheel via a gearbox to the propeller is the Hydro-pedal plane patent Number UM 43. The Hydro-pedalplane has motion transmission system below the floor of the boat and the propeller also operates under the boat.

The system has three main technical problems. Due to its keel drop, it is not easy to load the boat on the trailer and offload at sea for operation. You have to use other lifting mechanism for loading and offloading, which is expensive and cumbersome. Secondly it is not easy to carry out repairs while the boat is floating on water. Third the boat has always to lie on its side when stationary due to the keel drop. This makes the sand to scratch the paint and deface the sides of the hull, which increase the maintenance costs.

Many other prior art for example pedaling or cycling boats have not been designed for speed and cannot be used for racing on water and do not use air for propelling the boat on water.

The known prior art cannot also propel the boat with more than eight people with one operator or cyclist (Manual operation). Double cycling or pedaling of the prior art has been designed for uniform pedaling or cycling and the system is not designed for individual cycling with different speeds while rotating a single propeller.
Motorized boats of prior art do not use Air for propulsion and do not use air cooled engine. Their propulsion mechanism is not convertible for Air and Water, and the boat cannot reverse without engaging reverse gear. Prior art do not have a system that can be coupled to manual power, solar or air cooled engine.

In this respect, the prior art of propelling the boats on water exhibits a technical shortfall in operation. The present invention substantially departs from the conventional concepts and designs of the prior art, and in doing so provides an apparatus primarily developed for the purpose of effectively propelling boats on water by use of Overboard drive mechanism.

Objects of the Invention

Therefore, it can be appreciated that there exists a continuing need for new Overboard Drive Mechanism which can be used for transmitting motion from cycling means, solar system and air cooled engine to the propeller. In this regard, the present invention substantially fulfills this need.

An object of the invention is to provided Overboard Drive Mechanism that overcomes the first shortcoming of the prior art by availing the technical information and illustrations that provide solutions to prior art technical shortfalls.

It is therefore an object of the present invention to provide new Overboard Drive Mechanism which has all the mechanical advantages of the prior art for boat propelling system.

An is another object of the present invention to provide new Overboard Drive Mechanism which may be easily and efficiently manufactured and marketed and can be sold as individual unit. It is further object of the present invention to provide new Overboard Drive Mechanism which is, durable and reliable construction. An even further objective of the present invention is to provide new Overboard Drive Mechanism, which is susceptible of low cost manufacturing with regard to both materials and labor, and which accordingly is then susceptible to low prices of sale to consuming public,
thereby making such Overboard Drive Mechanism economically to buying public.

Another object of the present invention is to provide a new Overboard Drive Mechanism which can make it possible to develop future boats that can be used for water sport such as High Speed racing boats by manual powering and to be able to attract National, Regional and International water sport.

Still yet another object of the present invention is to provide new Overboard Drive Mechanism, which is portable and easy to transport, install and even repair while the boat is floating on the water and that you can use the same mechanism to maneuver the boat.

Even still another object of the present invention is to transmit motion from cycling means, solar system and air cooled engine to propeller and propel the boat on water. Also another object of the present invention is for the use of Navy Officers all over the world for physical fitness and to get rid of fear factor by regular riding on water. Another object of the present invention is to reduce carbon emission in the Air and noise, thus making the water craft environmental friendly.

Lastly, it is an object of the present invention to provide new Overboard Drive Mechanism, which provides Z motion to propeller in the water and S motion to propeller in the Air. The device also makes it possible to reverse the boat without reverse gear by developed technology of rotating the submersible gear box 360°.

SUMMARY OF THE INVENTION

In view of the foregoing disadvantages inherent in the known types of boat propulsion, powered manually, by solar and engine, now present in the prior art, the present invention provides a new Overboard Drive Mechanism. As such the general purpose of the present invention, which will be described with illustrations subsequently in greater detail, is to provide a new
Overboard Drive Mechanism and method which has all the advantages of prior art and more of the disadvantages.

To attain this, the present invention essentially comprises Overboard gearbox, aero gearbox or submersible gearbox which is linked together with a vertical link pipe. The Overboard gear box has a pulley which picks the motion from the power source horizontally, via sprockets, chain, shafts, gears, and convert the motion vertically and back to horizontal, to the propeller and a thrust force is produced to propel the boat forward.

The link pipe is designed to rotate in the overboard gearbox and is connected to the steering box by wire ropes, the chain and the sprocket. This makes it easier for the operator to turn the submersible gearbox/rudder and give a desired direction to the boat.

The device is also designed to pick the motion from the power source and convert it vertically upward to rotate the propeller in the air and give a forward thrust to the boat. The device is again, when the link pipe is fitted with a large spur gear, can enable the operator to rotate the submersible gearbox/rudder 360 degrees which makes it possible to reverse the boat without engaging a reverse gear.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description that follows may be better understood and in order that the present contribution to the art may be better appreciated. There are of course additional features of the invention that will be described herein after and which will form the subject matter of the claims appended hereto.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the detail of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also it is to be understood that the phraseology and terminology herein are for the purpose of description and should not be regarded as limiting.
As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of the structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions in so far as they do not depart from the spirit and scope of the present invention.

Further, the purpose of the foregoing abstract is to enable the patent offices and the public generally and especially the scientists, engineers and practitioners in the art who are not familiar with patent of legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by the claims or is intended to be limiting as to the scope of the invention in any way.

These together with other objects of the invention, along with the various features of the novelty which characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be to the accompanying drawings and descriptive matter, in which, there is illustrated preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a perspective of the left side of the complete cycling system of the preferred embodiment of the new Single Cycling Overboard drive mechanism, constructed in accordance with principle of the present invention.

Fig.2 is a perspective illustration of the right side of the overboard drive
Mechanism, as shown in fig.1.

Fig.3 is a Side view of the overboard drive mechanism as shown in figs.1 and 2.

Fig.4 is a cross section view illustrating the overboard drive mechanism as shown in figs.1, 2 and 3.

Fig.5 is a top plan view illustrating the device as shown in figs 1, 2, 3 and 4.

Fig.6 is an enlarged perspective illustrating a segment of the device taken at circle 22 of fig. 4 and 5.

Fig.7 is a perspective illustration of the preferred embodiment of the new Double Cycling Overboard drive mechanism of air propulsion, constructed in accordance with the principles of the present Invention.

Fig.8 is a perspective illustration of the preferred embodiment of the new Double Cycling Overboard drive mechanism of water propulsion, constructed in accordance with the principles of the present invention.

Fig.9 is a cross section view illustrating the device as shown in fig 8, for water propulsion.

Fig.10 is a cross section view illustrating the device as shown in fig 7 for Air propulsion.

Fig.11 is a top plan view illustrating the device as shown in figs 7, 8, 9 and 10 for both Air and Water propulsion.

Fig.12 is a perspective illustrating the assembled segments under the overboard gear box circle 6/38, of figs. 1, 2, 3, 4, 8 and 9.

Fig.13 is a perspective illustrating segments assembly of fig 12.
Fig. 14 is a perspective illustrating the segment, constructed in accordance with the principles of the present invention as shown in fig. 1 at circle 14 and 15.

Fig. 15 is a perspective illustrating the construction of the segment at circle 15 in fig. 1.

Fig. 16 is a top plan view illustrating the segment as shown in fig. 14 and 15.

Fig. 17 is a cross section view of the segment as shown in figs 14, 15 and 16.

Fig. 18 is a perspective illustrating the preferred embodiment of the new Overboard drive mechanism at circle 6 in fig. 18 run by an air cooled engine at circle 45 in fig. 18 constructed in accordance with the principles of the invention.

Fig. 19 is the top plan view illustrating the device at circle 6 in fig. 18.

Fig. 20 is a cross section view illustrating the device as shown in figs 18 and 19.

Fig. 21 is a perspective illustrating the arrangements of the components inside the device as shown in figs 18, 19 and 20 for internal lubrication.

Fig. 22 is a perspective illustration of the preferred embodiment of the new Overboard drive mechanism constructed in accordance with the principles of the present invention.

Fig. 23 is a top view illustrating the overboard drive mechanism at circle 6 in fig. 22.

Fig. 24 is a cross section view illustrating the device at circle 6 in fig. 22 and in fig. 23.

The same reference numerals refer to the same parts through the various figures.
DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the drawings, and in particular to fig: 1, 7, 8, 18, and 22 thereof, the preferred embodiment of the new Overboard Drive Mechanism, embodying the principles and concepts of the present invention and generally designed by the reference numerals 1 to 63 will be described.

The present invention, the new Overboard Drive Mechanism is a system comprised of a plurality of individual components, in their broadest context, such components are housed in the device. The components are individually configured and correlated with respect to each other to attain desired objectives.

The inventive steps of the present invention, is the arrangement or placement of individual components and their functional co-ordination in transmitting the power from the power source to the propeller which ultimately provide a forward thrust and propels the boat forward.

More specifically, as shown in fig. 1, 7 and 8, the cycling means is fitted on the top floor of the boat and the new Overboard Drive Mechanism 6 is fitted overboard on the transverse rear part of the boat, so that the submersible gearbox at circle 12 in fig.1, 7 and 8 drops into the water and the overboard gear box at circle 6 in fig. 1, 7 and 8 remain on the transverse rear part of the boat's hull.

The power is generated by manually turning the peddle 1 and transmitted to overboard gearbox 6 via the chain 2, wheel 3, vie belt 4, and received by pulley 5 which is fitted on overboard gear box 6. The overboard gearbox 6 picks the motion by the sprocket 20 which is fitted on the same transverse shaft 29 with the pulley 5 and via the chain 19 and sprocket 18, the spur gear 21 receives the motion via the shaft 30. The components, sprocket 20, chain 19, and sprocket 18, operates on the side of the overboard gear box 6 as shown in fig. 3 and are enclosed by the cover 17 in fig. 2.

The spur gear 21 as shown in fig. 4,5, and 6, is meshed with the spur bevel gear 22, which picks the motion directly, by the spur teeth 31, convert it from horizontal to vertical motion and delivers to the pinion 23 via its bevel teeth.
32. The pinion 23 is fitted to the vertical shaft 25 which transmit the motion down to the propeller shaft 26 via the pinion 28 and bevel gear 27 to the propeller 11, as shown in fig.4, 5 and 6.

The above explanation of power transmission from the source to the propeller 11 refers to single cycling system as in fig.1, 2, 3, 4 and 5. For the double cycling system, the arrangements of the components for power transmission is the same but the overboard gear box 6 in fig.7 and 8 is constructed to receive the motion with two pulleys 5.1 and 5.2 fitted on the two arms 33 and 34.

The chain 19 which Sinks the sprocket 20 and 18 operates internally with the shaft 39 that receives motion from the two pulleys 5.1 and 5.2 externally as shown in fig. 7, 8, 9, 10 and 11. The motion upwards in the air, to the propeller 36 as shown in fig. 10 is the same as in fig. 9 downwards, except the link pipe 37 which is connected to aero gearbox 35 is permanently welded on the cover of the overboard gear box 6.

The turning of the boat on water as shown in fig 1, the operation is the same way as the bicycle on road. This technology was created to make it easier for any person skilled in riding a bicycle on road, to ride the boat on water without any problem. The intention of the present intention was to create maneuverability that is friendly. The essential components of the installation of the maneuverability system comprises the handle bar 16, steering box 15, sink pipe 10 and submersible gearbox/rudder 12.

When the handle bar 16 is turned for example to the right, the steering box 15 as shown in fig.1, rotate the sprocket 14 and pulls the wire rope 13.2 which rotates the link pipe 10 under the overboard gearbox 6 and turn the submersible gearbox/rudder 12 to the left and resist water on the right coursing the boat to turn to the right.

To explain now in detail the essential components of maneuverability principles, I will start with the rear components which forms the rudder and propulsion system as shown in fig. 12 and 13, and which illustrates the components arrangements, assembly and the functional technology of the link pipe 10 which operates the submersible gearbox/rudder 12.
The axial pipe 7 is slotted through the bore made on the base of the overboard gearbox 6 and welded permanently on the base. A flange 8 is formed around the link pipe 10 by way of welding and cutting the molded weld on the lathe machine to create a stopper when the link pipe 10 is pushed through the axial pipe 7. The upper threaded end of the link pipe 10 which protrudes inside the overboard gearbox 6, is mounted on with the cup 24 which has the same diameter with the axial pipe 7.

The technological intention of the present invention, is to avoid axial movement of the link pipe 10, when the motion is being transmitted from the overboard gearbox 6, via the vertical shaft 25 which passes through the bearing 40 that is fixed in the centre of the cup 24, whose walls rest on the walls of the axial pipe 7 that protrude inside the overboard gearbox 6 and makes the submersible gearbox/rudder 12 to hang in the overboard gear box 6. The technology also solves two technical problems of turning and propelling the boat on water.

The distance between the cup 24 and the flange 8 is adequate to align the link pipe 10 while in turning motion. The cup 24 also align the shaft 25 whose pinion 23 meshes the bevel teeth 32 of the spur bevel gear 22 at right angle, for efficient vertical motion transmission. This also makes the link pipe 10 to rotate in the axial pipe 7 while the propeller 11 receives the motion from the overboard gear box 6, without interference. Oil rings are fitted on the walls of axial pipe 7 to avoid the oil in the overboard gearbox 6, to leak downwards. The rotation of the link pipe 10 inside the axial pipe 7 is coursed by the pulling action of the wire ropes 13.1 and 13.2 which are fixed on the steel plates 9 that are welded on the opposite sides of the link pipe 10.

Another essential component of boat maneuverability system is the steering box 15 in fig. 14. The technology used is meant to enable the boat operator to turn the boat on water using the handle bar 16 the same way the bicycle is turned on the road. Figure 15, 16 and 17 illustrate the arrangement of the components and assembly of fig. 14. The shaft 41 is fitted on the spur gear 43 that is meshed with spur gear 44 which is fitted on shaft 42 that is attached to the sprocket 14.
When the turning motion is created on the shaft 41 by the handle bar 16, the spur gear 43 moves and turn spur gear 44 in the opposite direction which turns sprocket 14 via shaft 42. The wire ropes 13.1 and 13.2 are attached to chain that is moved by the sprocket 14. So when the movement is created on the sprocket 14, the wire ropes 13.1 and 13.2 moves in the opposite direction and the link pipe 10 rotates in the axial pipe 7 and turn the submersible gearbox/rudder 12, which ultimately change the direction of the boat. For the air propulsion, the overboard gearbox 6, the rudder and the rudder post 38 as shown in fig. 7, is fitted underneath the overboard gearbox 6 and is made to rotate and turn the boat the same way the link pipe 10 and submersible gearbox 12 does.

The present invention also can be used on a solar system by way of using pulley system, especially to transmit motion from the solar system to the present Overboard drive mechanism or by direct coupling.

The present invention again as shown in fig. 18 at circle 6, can be powered by air cooled engine which also is installed overboard where it can receive sufficient air to cool itself. The technology is intended to make it possible to rotate the propeller in the air and create a thrust force to propel the boat on water on high speed.

This will also make the boat builders to come up with innovative Industrial designs to accommodate the present invention. The present invention also is intended to change the traditional way of using marine engines for power production as opposed to air cooled engines. The device will also assist to reduce the travel time and increase the number of passengers who will prefer to use maritime transport.

The present invention therefore as shown in fig 18 comprises the Overboard drive mechanism 6, propeller pipe 46, aero gearbox 35 and the propeller 36. The power created by the air cooled engine 45 is transmitted to the Overboard Drive mechanism 6 via the coupling 47. The power is then boosted and converted from horizontal motion to vertical motion at right angle to the propeller pipe 46, and propeller 36 via couplings 47 and aero gearbox 35. A thrust force is then created by the propeller 36 to propel boat forward.
For the detailed description of the device 6 as shown, in fig. 19 and 20, the device is modified to suit the engine power and the nature of operation. The power generated by the engine is delivered to the device via the shaft 48 fitted with the bevel gear 49. The combined spur bevel gear 50 which is constructed with two different gears in one piece, picks the motion and transmit it to the spur bevel gear 22 which again picks the motion with its spur teeth 31 and deliver to bevel gear 51 that is connected to the shaft 52 with its bevel teeth 32 and the motion is finally transmitted to the propeller 36.

The combined bevel spur gear 50 has also another function of rotating spur gear 53 to operate the oil pump 55, which sucks oil through sanction pipe 56 and delivers to corn rod bearings inside the device via the delivery pipe 54. The present invention was created to avoid installing a heavy engine on the top of the boat like that of the aero plane on the wings, which also creates difficulties in repairing the engine, while the boat is at sea.

Lastly the present invention also can be used on vessels cleaning the lake for example like water hyacinth on Lake Victoria in East Africa. The device is designed to rotate the subversive gearbox 360 degrees using only a steering wheel. This makes it possible to maneuver the vessel easily to any direction without a reverse gear. In this particular Overboard Drive Mechanism, all internal gears are meshed as shown in fig. 23 and 24,

To explain in detail as shown in fig. 22, while the device is being run by the engine 45 via the pulley 59, vie belt 60, and pulley 5, the operator, holding the steering wheel 63, is able to move the vessel on water forward and backwards without using a reverse gear. The motion received by the pulley 5 on the device as shown in fig.23 and 24 is received by the spur gear 58 which is fixed on the same shaft with the pulley 5 and transmitted to spur gear 21 via spur gear 57 fixed on the same shaft. The motion finally reaches the spur bevel gear 22 and is converted vertically down to the propeller 11.

A large external spur gear 61 is fitted on the link pipe 10 to replace the flange 8 which now acts as a stopper for axial movement between the cup 24 and the spur gear 61 as shown in fig. 24. The pinion 62 which is fitted on the
steering system, is meshed with the spur gear 61 for the turning of the submersible gearbox/rudder 12.

So when the steering wheel 63 is made to turn by the operator, the pinion 62 turns the spur gear 61 that is fixed on the link pipe 10 which finally turns the submersible gearbox / rudder 12 to the desired direction. This present technology therefore has been created operation friendly.

The present invention should increase the likelihood of people to buy the present invention because it makes the assembly, and operation more attractive to the general public and the present invention is also likely to be produced everywhere in the world as it is suitable for water racing cycling sport, and is likely to attract International water cycling sport. As to the manner of usage and operation of the present invention, the same should be apparent from the above description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

With respect to the above description then, it is to be realized that the optimum dimensional relationship for the parts of the invention, to include variation in size, materials, shape, form, function and manner of operation, assembly and use are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equipments may be resorted to, falling within the scope of the invention.
CLAIMS

1. An Overboard Drive Mechanism characterized by:
   
   a) the single cycling system;  
   b) the double cycling system;  
   c) the air propulsion system;  
   d) the maneuverability systems, and  
   e) the engine powered system.

2. An Overboard Drive Mechanism, of the single cycling system, with maneuverability system characterized by its configuration, segments with components comprising, pulleys, sprockets, chain, shafts, gears, and the propeller as in claim 1a.

3. An Overboard Drive Mechanism, of the double cycling system, characterized by its configuration, comprising components as in claim 1b and 2.

4. An Overboard Drive Mechanism, of the air propulsion system characterized by its configuration, comprising components as in claim 1c and 2.

5. An Overboard Drive Mechanism, of engine powered, for air propulsion, characterized by its configuration, comprising components as in claim 2.

6. A combined Spur Bevel gear characterized by its construction and function as in claim.

7. A spur bevel gear characterized by its construction and function as in claim, 2, 3, 4, and 5.

8. An Overboard Drive mechanism, with maneuverability system, characterized by its configuration, comprising components as in claim 2 with external features, a large spur gear, a pinion and a steering wheel that enables maximum rotation of the submersible gearbox/rudder of 360 degrees.
9. A manual, solar, or engine powered Overboard Drive Mechanism for boats propulsion in water, in air and maneuverability, characterized by the design and inventive steps.

10. The use of the apparatus of the present invention as per claims 1-9, for boat racing, leisure, rescue during floods, transport, and patrol, characterized by design and creativity.