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HAND FREE GRIP-TWIST CONTROL

The current invention relates to one or more devices and methods for a hand free grip-twist control. The invention also relates one or more methods for making, assembling, disassembling, installing, configuring, maintaining, repairing and using the one or more devices for the grip-twist control.

A handgrip grip-twist mechanism has a rotatable grip around a handlebar. The rotatable grip when rotated will usually not stay in a new position but will return to its original position. This is a result of a spring within the rotatable grip that forces the rotatable grip to return to its original position.

One example is a handgrip controlled motorcycle which faces an inherent problem of maintaining a fixed speed of the motorcycle. The rider of the vehicle has to place his hand on the grip and apply a rotational force resulting in fatigue of the rider’s wrist and hand. Once the hand of the rider is released from the grip, the speed of the motor resumes to its steady state and the travelling motorcycle decelerates.

The conventional way of maintaining the speed of the motorcycle is to grip and twist on a handle grip. This however increases the fatigue level of the rider's wrist and hand. This art works on automatic as well as on manual gear systems.

Another way of maintaining the speed of the motorcycle is to lock the grip by an external device. This however poses a potential hazard. In the event of an emergency, the rider would have to unlock before assuming control of the motorcycle.

It is an object of the present invention to provide a new and an improved grip-twist control for improving the user experience when using a grip-twist type of control.

The present invention further aims to provide one or more new and useful methods for making, assembling, disassembling, installing, configuring, maintaining, repairing and using the one or more tools for the grip-twist control. Essential features of the invention are provided by one or more independent claims, whilst advantageous features are presented by their dependent claims respectively.

According to a first aspect, the present invention provides a griptwist control for regulating the speed of a motorcycle engine whereby a tension cable tethered to a cable retainer stays at a position even when a rider releases his grip on the handgrip.

The grip-twist control device comprises a housing body providing housing for a cylindrical extension surrounding the handlebar. The housing body supports a rotating part with a grip portion along the handle for the rider to hold tight on and a cable retainer for retaining a tension cable. A ring secured to the cylindrical extension on the housing body secures the rotating part in the middle preventing it from slipping out of the handlebar. The tension cable is tethered to the cable retainer at the rotating part. When the rider grips and twists the grip part at the rotating part, the tension cable will be pulled or released accordingly. The ball of the cable retainer may not be spherical.

The tension cable head has a retainer that is linked through the housing support held tightly in between a key way linking all the way to the carburettor with a tensional spring force(s). When the rider applies an equal or greater force, it causes the engine to raise the revolutions per minute higher till upon engaging in a gear causing a motion to surge.

The grip works both with and without any tension cable.

In a first embodiment, the tension cable is secured by using the attraction force and/or repelling forces of a magnet located at the cable retainer where the tension cable is held. The ball of the cable retainer rests on one of the circular dimples of the annular disc at the housing body. When the rider twists the grip, the cable ball travels on the

dimples. The attraction force and/or repelling forces of the magnet create(s) a firm resistance and prevents the cable ball from reverting to its original position when the rider's hand is released.

The grip-twist control comprises a housing body secured to a handlebar. The housing body has a cylindrical extension surrounding the handlebar and a housing annulus with a recess. An annular disc having a plurality of indented circular dimples and an indented concentric groove connecting the circular dimples is located in the recess of the housing annulus. A rotating part has a cable retainer, with an annular magnet at an inner hollow cavity of the cable retainer and mounted on the cylindrical extension by rotating around the cylindrical extension, with the housing annulus at least partially surrounding the cable retainer. A ring is positioned at the distal end of the rotating part and connected to the cylindrical extension. The cylindrical extension has a plurality of protrusions extending from one end, the protrusions having a plurality of retaining profiles for coupling the ring, with the protrusions and retaining profiles not exceeding an outer diameter of the cylindrical extension.

In a second embodiment, the annular disc is replaced by a circular tool with a saw tooth periphery. Instead of using a magnet, a rotatable annular ring with a cable hanger is employed. The edge of the cable hanger rests on one tooth of the saw tooth periphery. A retaining coil also known as a spring or resistance is used to exert a tensional force on the rotatable annular ring pushing onto the circular tool with a saw tooth periphery. Similar to the first embodiment, when the rider releases his grip, the tension cable remains as is because the cable hanger is attached to the saw tooth periphery.

The second embodiment comprises the housing body secured to the handlebar, the housing body having the cylindrical extension surrounding the handlebar and the housing annulus having the recess. A circular tool having a hole in the centre with a saw tooth periphery is located in the recess of the housing annulus. A rotatable annular ring has a cable hanger with an edge. A retaining coil or a spring is positioned at the

opposite surface of the annular ring having the cable hanger with the edge. The rotating part is mounted on the cylindrical extension by rotating around the cylindrical extension, with the housing annulus at least partially surrounding the cable retainer. The ring is positioned at the distal end of the rotating part and connected to the cylindrical extension. The cylindrical extension has a plurality of protrusions extending from one end, the protrusions having a plurality of retaining profiles for coupling the ring, with the protrusions and retaining profiles not exceeding an outer diameter of the cylindrical extension.

In the first and second embodiments, the tension cable is controlled by devices interacting between the cable retainer and the housing body using magnetic force and mechanical force by spring tension or frictional forces.

In a third embodiment, the control of the tension cable lies at the distal end of the grip part and the ring. There is no direct interaction with the tension cable, wherein the tension cable is secured by the cable retainer. The principle is to control the grip part, making it stationary when the rider’s hand is released by having the annular magnet near the ring and a rotatable annular disc in the groove at the distal end of the grip part. The annular magnet is different from the first embodiment. The annular magnet in the third embodiment has a circular protrusion on one of the surfaces. This protrusion is to rest in one of the dimples on the rotatable annular disc. When the rider twists the grip part, the rotatable annular disc interacts with the protrusions on the annular magnet.

The third embodiment comprises the housing body fixed to the handlebar, the housing body having the cylindrical extension surrounding the handlebar and the housing annulus having the recess. The rotating part is mounted on the cylindrical extension by rotating around the said cylindrical extension, with the housing annulus at least partially surrounding the cable retainer. A rotatable annular disc having a plurality of indented circular dimples and an indented concentric groove connecting the circular dimples is located in the groove of the rotating part. An annular magnet has a round protrusion on

at least one of its surfaces. The ring is positioned at the rotating part and connected to the cylindrical extension. The cylindrical extension has a plurality of protrusions extending from one end, the protrusions having a plurality of retaining profiles for coupling the ring, with the protrusions and retaining profiles not exceeding an outer diameter of the cylindrical extension.

In a fourth embodiment, the tension cable control is addressed between the cable retainer and the proximal end of the grip part. The proximal end of the grip part is the section that interacts with the cable retainer. The rotating part comprises the cable retainer and the grip part which are separated. The cable retainer side has a hole disposed at the centre with a square teeth periphery. Correspondingly, there is a protruded centre hole at the proximal end of the grip part. The protruded centre hole has a corresponding square tooth perimeter. When the rider’s hand twists the grip, the square tooth will interact with the square tooth at the cable retainer. The grooves and ridges of the square tooth prevent the tension cable from returning to its original position, thereby achieving the desired result.

The fourth embodiment comprises a housing body fixed to a handlebar, the housing body having a cylindrical extension surrounding the handlebar and a housing annulus having a recess. A cable retainer having a hole disposed in the centre with at least one square tooth periphery is mounted on the cylindrical extension by rotating around the said cylindrical extension, with the housing annulus at least partially surrounding the cable retainer. A rotatable grip part has a protruded portion disposed in the centre at one end with at least one corresponding square tooth periphery, and a cable hanger on at least one of the square teeth and mounted into the square tooth periphery at the cable retainer. The ring is positioned at the rotating part and connected to the cylindrical extension. The cylindrical extension has a plurality of protrusions extending from one end, the protrusions having a plurality of retaining profiles for coupling the ring, with the protrusions and retaining profiles not exceeding an outer diameter of the cylindrical extension.

In a fifth embodiment, the grip part is long and encapsulates a longer surface area of the handlebar. The retaining profiles are T-shaped and connected with the correspondingly shaped securing profiles on the ring. The securing profiles on the ring are hooks.

Alternatively, the magnets used in the first and third embodiments can instead be non-magnetic pieces. In the first embodiment, the compression between the annular disc having the dimples and the inner hollow cavity at the cable retainer provides enough compressional force to secure the ball of the tension cable. Therefore, the annular magnet may be replaced or omitted. In the third embodiment, the annular magnet with the circular protrusion ~~is~~ positioned at the ring may instead be a non-magnetic piece. The annular magnet may be replaced with an annual disc with a circular protrusion.

In embodiments two and three, the saw tooth and square tooth shaped periphery formed along the periphery respectively are used for illustrative purposes. In fact, it can be of any shape as long as it provides a ridge and groove concept. The number of teeth may be increased to ensure a smooth rotation of the rotating part.

The retaining profiles are capable of being joined and released to the securing profiles on the ring. The retaining profiles are openings in the protrusions.

The plurality of protrusions has a limited spring travel in a radial direction. The protrusions have a configuration such that they are connected to and or released from the ring when the grip-twist control device is not mounted onto the handlebar.

The securing profile is released from the retaining profile by turning the ring relative to the cylindrical extension.

The rotating part is secured in an axial position by the housing body at one end and an end face of the ring at the other end. The rotating part is surrounded by a grip part made from a rubber-elastic material and fixed to the rotating part which is rotational. The rotating part is encapsulated by the grip part, thereby attaching it permanently to the rotating part.

On a side opposite the cable retainer, the distal end of the grip part has an angulated rim extending beyond an overall length of the rotating part, extending radially inward and projecting into an outward facing groove in the ring to form an intricate seal.

The groove of the ring is formed in a collar substantially covering an end of the grip part.

The outside diameter of the cylindrical extension is designed as a matching support for the rotating in relation to the rotating part without gaps.

The method of controlling the speed of a motor engine with the grip-twist control for controlling the cable tension to the motor engine transmission comprises:

Gripping the grip part.
Rotating the grip part.
Providing a corresponding cable tension to the motor engine.
Securing the position of the grip part.
Releasing the position of the grip part.

The means for securing and releasing is by a tensional force exerted between two corresponding surfaces. One of the means is by a retaining coil.

The means for securing and releasing is by attraction force exerted between two corresponding surfaces. One of the means is by a magnet. Another means may be by an electromagnet.

The method of assembling the first embodiment comprises the following steps:

Sliding the housing body onto the handlebar tube of the handlebars of the motorcycle.

Sliding the annular disc into the housing annulus of the housing body. The annular disc is a circular disc with a hole in the centre. The diameter of the hole is longer than the cross sectional diameter of the handlebar.

Sliding the rotating part onto the handlebar tube of the handlebars of the motorcycle.

Pulling a tension cable from a cable inlet to a cable hanger at the cable retainer.

Rotating the cable retainer with the annular magnet to secure the tension cable on itself.

Supporting the cable ball of the tension cable at the circular dimple of the annular disc at the recess of the housing annulus.

Encapsulating the rotating part in the housing body.

Sliding the ring onto the handlebar tube of the handlebars of the motorcycle.

Securing the housing body, the annular disc and the rotating part with the ring by aligning the retaining profiles at the protrusions with the securing profiles at the ring.

The method of assembling the second embodiment comprises the following steps:

sliding the housing body onto the handlebar tube of the handlebars of the motorcycle, sliding the circular tool with a saw tooth periphery similar to a gear into the housing annulus of the housing body, sliding the rotating part onto the handlebar tube of the handlebars of the motorcycle, pulling a tension cable from a cable inlet to a cable hanger at the annular ring, rotating the cable retainer with the annular ~~tool~~ ring to secure the tension cable on itself,

supporting the edge of the cable hanger in between two saw tooth peaks along the periphery of the circular tool located at the recess of the housing annulus, encapsulating the rotating part in the housing body, sliding the ring onto the handlebar tube of the handlebars of the motorcycle, and securing the housing

body, the annular disc and the rotating part with the ring by aligning the retaining profiles at the protrusions with the securing profiles at the ring.

The method of assembling the third embodiment comprises the following steps:

sliding the housing body onto the handlebar tube of the handlebars of the motorcycle,

sliding the rotating part onto the handlebar tube of the handlebars of the motorcycle, pulling a tension cable from a cable inlet to a cable hanger at the cable retainer, rotating the cable retainer to secure the tension cable on itself, supporting the cable ball of the tension cable at the cable retainer, encapsulating the rotating part in the housing body, inserting the annular disc with the dimples and concentric groove into the grip part of the rotating part, inserting the annular magnet with a knob into the ring, having the knob rest on one of the dimples of the annular disc,

sliding the ring onto the handlebar tube of the handlebars of the motorcycle, and securing the housing body, the annular disc and the rotating part with the ring by aligning the retaining profiles at the protrusions with the securing profiles at the ring.

The method of assembling the fourth embodiment comprises the following steps:

sliding the housing body onto the handlebar tube of the handlebars of the motorcycle, sliding the cable retainer having the centre hole with a square tooth periphery onto the handlebar tube of the handlebars of the motorcycle, sliding the grip part having the protruded centre hole with the corresponding square tooth periphery and inserting it in the cable retainer, pulling a tension cable from a cable inlet to a cable hanger at the grip part, sliding the ring onto the handlebar tube of the handlebars of the motorcycle, and securing the housing body, the annular disc and the rotating part with the ring by aligning the retaining profiles at the protrusions with the securing profiles at the ring.

The grip-twist control device provides manual smooth control achieving a fixed position on the grip portion by controlling the tension cable. The tension cable is secured by means of compression, tension and attraction. The means are achieved mechanically and magnetically by using springs, gear like structures and magnetic force.

The motorcyclist using the present invention can enjoy travelling a longer distance road trip on the motorcycle. The motorcyclist maintains a smoother travelling speed, with the controlling hand gently moving the hand grip portion to a position that corresponds to a desired speed and then releasing from the gripping posture position. The grip part will remain in the set desired speed, relieving wrist tension. Whenever wanting to change the travelling speed, the motorcyclist just holds on the grip part and twists the grip part by either flexing or extending his wrist. Flexing the wrist will pull the tension cable and thus increase the travelling speed. Extending the wrist will slacken the tension cable and thus decrease the travelling speed.

The mechanism in the housing body, the rotating part and the ring provide means to secure the tension cable.

The subject of the present invention is now explained with respect to the following figures in which:

Fig. 1 illustrates an exploded view of the first embodiment of the grip-twist control device having an annular disc with dimples located at a housing body;

Fig. 2 illustrates a second embodiment of the grip-twist control device having a circular tool with a saw tooth periphery located in the recess at the housing annulus;

Fig. 3 illustrates a third embodiment of the grip-twist control device having the annular magnet located at the ring and the annular disc located at the grip part;

Fig. 4 illustrates a fourth embodiment of the grip-twist control device having a cable retainer with a centre hole with a square teeth periphery, and a corresponding square teeth periphery formed in one end of the grip part;

Fig. 5 illustrates a fifth embodiment of the grip-twist control device having a longer grip part and a different cylindrical extension; and

Fig. 6 illustrates the grip part having an angulated rim of the rotating part of the grip-twist control device.

In the following description, details are provided to describe the embodiments of the present specification. It shall be apparent to one skilled in the art, however, that the embodiments may be practised without these details or with other details.

Some embodiments have similar parts. The similar parts may have the same names or similar part numbers. The description of one part applies by reference to another similar part, where appropriate, thereby reducing the repetition of text without limiting the disclosure of the description.

Fig. 1 illustrates to a first embodiment of the present invention. In particular, Fig. 1 illustrates an exploded view of the first embodiment of the grip-twist control device **100** comprising a housing body **101**, an annular disc **103**, a rotating part **105** and a ring **107**.

The housing body **101** comprises a cylindrical extension **109** and a housing annulus **111** having a recess **113**. The annular disc **103** is positioned at the recess **113** of the housing annulus **111**.

On a first side of the annular disc **103**, there is a plurality of circular dimples **118** indented around its periphery. Connecting the circular dimples **118** is a concentric groove **120**. The circular dimples **118** and the concentric groove **120** are indented. The

depth of indentation is relative to the size of the cable ball. It is not to be more than one half of the radius of the cable ball. On a second side of the annular disc **103** is a flat surface. The second side of the annular disc **103** is inserted into the recess **113** of the housing annulus **111**. The first side of the annular disc **103** faces the cable retainer **115**.

The rotating part **105** having a cable retainer **115** with an annular magnet **116** at the inner hollow cavity of the cable retainer **115** is mounted on an end of the cylindrical extension **109** with protrusions **117**. The flat surface is lodged in the hollow cavity of the cable retainer **115**. The housing annulus **111** encompasses the cable retainer **115**. The rotating part **105** having the cable retainer **115** with the annular magnet **116** will rotate on a longitudinal axis about the handlebar when mounted on the handlebar.

The ring **107** is positioned at one side of the rotating part **105** on the distal end of the cylindrical extension **109** with protrusions **117**. The ring **107** has a plurality of securing profiles **121**, a groove **123** and a collar **125**.

The cylindrical extension **109** has a plurality of protrusions **117** on one end, and a plurality of retaining profiles **119** for coupling the ring **107**. The radial surface of the cylindrical extension **109** serves as a supporting surface for the rotating part **105**, which has an outside diameter **127** which must not be exceeded by the protrusions **117** with the retaining profiles **119** to ensure a secure fit.

The rotating part **105** is mounted to the housing body **101** by pushing it over the protrusions **117** and onto the cylindrical extension **109** of the housing body **101**. This results in the rotating part **105** being fixed to the housing body **101** and supported on the cylindrical extension **109**.

The housing body **101** provides a casing for the intricate parts like the annular disc **103** and a tension cable (not shown) guided through a cable inlet (not shown) into the cable

retainer **115** of the rotating part **105**, thereby providing protection from ~~the~~ dust and water.

The annular magnet **116** at the inner hollow cavity of the cable retainer **115** provides an attraction force to the annular disc **103** with circular dimples **118** found in the recess **113** of the housing annulus **111** of the housing body **101**.

The cable ball of the tension cable is supported in the circular dimple **118** of the annular disc **103** partially. A small surface area of the cable ball rests in the circular dimple **118**. The concentric groove **120** on the first side of the annular disc **103** provides a track for the cable ball to move from one circular dimple **118** to the adjacent circular dimple **118**.

The ring **107** provides a locking mechanism to fasten the rotating part **105** to the housing body **101** and to the handlebar (not shown).

The method of assembly for the grip-twist control device **100** provides the housing body **101** configured in a way that the tension cable (not shown in the figure) may be pulled and released to control a motorcycle engine transmission.

In a lengthwise direction, distal from the housing body **101**, the cylindrical extension **109** has protrusions **117** with retaining profiles **119** that can be joined together with securing profiles **121** of the ring **107**. The rotating part **105** is mounted to the housing body **101** by pushing it over the protrusions **117** and onto the cylindrical extension **109** of the housing body **101**.

The flat surface of the annular disc **103** is inserted into the recess **113** of the housing annulus **111**. The tension cable is connected to the cable retainer **115** arranged on the rotating part **105**. A cable ball located at the end of the tension cable is arrested by a cable hanger found in the cable retainer **115**. The tension cable is then wound around

the cable retainer **115**. The tension cable is slackened during installation to provide easy access.

The rotating part **105** having the cable retainer **115** with the annular magnet **116** is mounted on the cylindrical extension **109** by rotating around the ~~said~~ cylindrical extension **109** connected to the housing body **101**.

The cable ball of the tension cable is meticulously placed on one of the circular dimples **118** on the first side of the annular disc **103** at the recess **113** of the housing annulus **111**.

The cable ball supported by the cable hanger at the cable retainer **115** will move from one circular dimple **118** to the adjacent circular dimple on the concentric groove **120** when the rotating part **105** is rotated in either direction. The attraction force of the annular magnet **116** with the annular disc **103** creates a grip strength that will hold the cable ball of the tension cable in a fixed position and hence maintain a fixed speed of the revolution of the motor engine.

The final assembly is having the rotating part **105** being attached to the housing body **101** by pushing it over the protrusions **117** and onto the cylindrical extension **109**. ~~and~~ The rotating part **105** is thus secured by the ring **107** on the distal end of the cylindrical extension **109**.

Alternatively, the annular disc **103** may be a piece of magnet to provide a stronger attraction force with the annular magnet **116** and hence create a stronger grip on the cable ball. The magnet can be an electromagnet which derives its magnetism from a power source on the motorcycle or a permanent magnet.

Fig. 2 illustrates a second embodiment of the grip-twist control device **100**^{I} having a circular tool **131** with saw tooth periphery located in the recess **113** at the housing annulus **111**.

A non-rotatable circular tool **131**, with a hole in the centre in which the diameter of the hole is at least the outside diameter **127** of the cylindrical extension **109** with a saw tooth periphery similar to a gear, is located in the recess **113** at the housing annulus **111**.

An annular ring **133** of non-magnetic characteristics is at the inner hollow cavity **129** of the cable retainer **115**. The annular ring **133** has a retainer spring **135** that exerts a constant tension on the cable hanger **141** pushing against the saw tooth periphery of the circular tool **131**.

The cable hanger **141** has an edge **139** that can fit in between two saw tooth peaks along the periphery. Each saw tooth along the periphery of the circular tool **131** has two surfaces converging at a point. The two surfaces allow smooth movement of the cable hanger edge **139** from one tooth to the adjacent tooth.

The saw tooth provides a support on the edge **139** of the cable hanger **141** ~~causing~~ restricting the cable retainer **115** from rotating and thus fixing the tension cable.

In operation, the grip part **137** of the rotating part **105** is rotatable. The cable hanger **141** with the edge **139** holding the cable ball (not shown) travels along the saw tooth periphery of the circular tool **131** at the housing annulus **111**, one tooth at a time in either direction. Hence the cable ball with the tension cable will be fixed at a desired position. A change in the cable ball position will have to be actuated by the motorcyclist either by extending or flexing the wrist.

Fig. 3 illustrates a third embodiment of grip-twist control device **100^{II}**. The annular magnet **116^{II}** which is non-rotatable is located at the ring **107**. The annular disc **103^{II}** with the dimples **118^{II}** and concentric groove **120^{II}** is located at the grip part **137** end of the rotating part **105**.

The annular disc **103** described in the first embodiment is different from the annular disc **103^{II}** in the third embodiment in terms of size. The cross sectional diameter is shorter to fit into the end of the grip part **137**.

The annular magnet **116** described in the first embodiment is different from the annular magnet **116^{II}** in the third embodiment. The annular magnet **116^{II}** in the third embodiment has a knob (round protrusion) **143** on one of its surfaces. The knob **143** is supported by one circular dimple **118^{II}**. The knob **143** is circular and fits into one circular dimple **118^{II}**. The knob **143** is about one half of a sphere having a cross sectional diameter of at least the diameter of the circular dimple **118^{II}**.

In use, the knob **143** on the annular magnet **116^{II}** travels on the dimple **118^{II}** and the concentric groove **120^{II}** when the rotating part **105** is rotated by the motorcyclist. The knob **143** will fix the position of the rotating part **105,** which in effect fixes the position of the tension cable (not shown).

Fig. 4 illustrates a fourth embodiment of the grip twist control device **100^{III}** having a centre hole with at least a square tooth periphery formed in the non-rotatable cable retainer **115^{III}**. A corresponding square teeth periphery is formed in one end of the grip part **137^{III}** with a cable hanger **141^{III}**. The non-rotatable cable retainer **115^{III}** is fastened to the housing body **101^{III}**. The square teeth periphery has a depth of about ten millimeters (10mm) disposed in the centre hole of the cable retainer **115^{III}**.

The grip part **137^{III}** having at least a corresponding square tooth along the perimeter of a protruded middle hole is rotatable about the cable retainer **115^{III}**. The protruded middle

hole with the square teeth periphery is not shown in the figure in particular. The cable hanger **141^{III}** is located at one of the square teeth along the perimeter of the middle hole.

The ring **107^{III}** is fastened to the cylindrical extension of the housing body **101^{III}** securing the grip part **137^{III}**. The diameter of the corresponding square teeth perimeter at the grip part **137^{III}** is shorter than that of the square teeth periphery at the cable retainer **115^{III}**.

The square teeth periphery on the non-rotatable cable retainer **115^{III}** provides a narrow horizontal surface for the cable hanger **141^{III}** to latch on. The cable hanger **141^{III}** provides a support for the tension cable.

In use, the non-rotatable cable retainer **115^{III}** is mounted onto the housing body **101^{III}** by pushing it over the protrusions **117^{III}** of the cylindrical extension **109^{III}**. The corresponding protruded (not shown), smaller square teeth perimeter on the grip part **137^{III}** is analogous to a male connector and inserted into the bigger female square teeth periphery hole at the cable retainer **115^{III}**. The tension cable is then mounted on the cable hanger **141^{III}** on the square teeth perimeter of the grip part **137^{III}**. The user rotates the grip part **137^{III}** and in turn rotates the square shape teeth gear. The cable hanger **141^{III}** with the tension cable travels on the non-rotatable bigger square shape teeth gear, each tooth at a time either pulling or releasing the tension cable.

The method of assembly is similar to the earlier embodiments one to three.

Fig. 5 relates to a fifth embodiment of the grip-twist control device **100^{IV}** having a longer grip part **137^{IV}** and a different cylindrical extension **109^{IV}**. The fifth embodiment comprises parts or method steps that are similar or identical to those of the earlier embodiments one to four. Description of the similar or identical parts or method steps is hereby incorporated by reference, wherever relevant and appropriate.

Fig. 5 illustrates an exploded view of the fifth embodiment of another grip-twist control device **100^{IV}** comprising a housing body **101^{IV}**, an annular disc **103**, a rotating part **105^{IV}** having an annular magnet **116** and a ring **107^{IV}**.

While the retaining profiles **119** of the grip-twist control device shown in Fig. 1 are designed as apertures, the protrusions **117^{IV}** shown in Fig. 5 have Tshaped retaining profiles **119^{IV}** that can interact with correspondingly shaped securing profiles **121^{IV}** in the ring **107^{IV}**. The difference between the assembly of the ring **107^{IV}** with the protrusions **117^{IV}** and the assembly of the ring **107^{IV}** with the protrusions **117^{IV}** is that, after being latched in, the retaining profiles **119^{IV}** of the protrusions **117^{IV}** can be disengaged from the securing profiles **121^{IV}** by turning the ring **107^{IV}**. During this process, the protrusions **117^{IV}** are deflected radially inward, and the ring **107^{IVI}** can be pulled off axially. This is only possible while the grip-twist control device **100^{IV}** is not mounted on the handlebar tube of the handlebars of the motorcycle.

In addition to the above mentioned difference in the retaining profiles **119^{IV}**, the grip part **137^{IV}** of the rotating part **105^{IV}** is longer. The longer grip part **137^{IV}** covers a longer part of the handlebar providing more grip for the motorcyclist.

In use, the speed control apparatus **100^{IV}** is mounted onto a handlebar tube of the handlebars of the motorcycle. The housing body **101^{IV}** is pushed onto the circumference of the handlebar, followed by the rotating part **105^{IV}** and finally by the ring **107^{IV}** to secure the grip-twist control device **100^{IV}**. The rotating part **105^{IV}** extends longer and encompasses the handlebars.

A motorcyclist uses his right palm to grip on the grip part **137^{IV}** of the rotating part **105^{IV}** to control the speed of revolution of the motorcycle engine.

The method of operating the grip-twist control device **100^{IV}** to control the revolution of the motor engine provides a motorcyclist ~~in~~ with a gripping and a nongripping mode.

In the gripping mode, the motorcyclist grips the rotating part **105^{IV}** and may rotate it either in a forward direction (wrist extension) or a backward direction (wrist flexion) about the axis of the handlebar. In a backward direction, the tension cable is pulled and thereby increases the speed of revolution of the motor. In a forward direction, the tension cable is loosened and hence decreases the speed of revolution of the motor.

In the non-gripping mode, the rotating part **105^{IV}** remains in a fixed position even after the motorcyclist releases his grip on the rotating part **105^{IV}**. The speed of the revolution of the motor is determined by the degree of rotation of the rotating part **105^{IV}**, which pulls or loosens the tension cable.

Referring to Fig. 1 and Fig. 5, the ring **107,107^{IV}** is pushed over the protrusions **117,117^{IV}** within the rotating part **105,105^{IV}** until the securing profiles **121,121^{IV}** of the ring **107,107^{IV}** fit together with the retaining profiles **119,119^{IV}** of the protrusions **117,117^{IV}**. This results in the protrusions **117,117^{IV}** being forced to deflect inward during assembly. Once the securing profiles **121,121^{IV}** are fitted together with the retaining profiles **119,119^{IV}** of the protrusions **117,117^{IV}**, the rotating part **105,105^{IV}** is fixed axially relative to the ring **107,107^{IV}** by an end face; and in the other direction, is fixed along an axis relative to the housing body **101,101^{IV}**.

The smallest inside diameter of the cylindrical extension **109^{IV}** with its protrusions **117^{IV}** corresponds to the diameter of the handlebar. The rotating part **105^{IV}** has a grip part **137^{IV}** connected to a radially outward-facing surface of the rotating part **105^{IV}**, which is made from a rubber-elastic material to allow better operation by the hand of the motorcycle rider.

With reference to Fig. 6, the grip part **137^{V}** has an angulated rim 145 that projects beyond the axial length of the rotating part **105^{V}**. The angulated rim **145** points extends radially inward and into a groove **123^{V}** in the ring **107^{V}**, thereby providing an intricate

seal against contamination of the interior of the rotating part **105**^{II} and the housing body. The groove **123**^{V} is formed by an outer collar **125**^{V} at the end of the grip part **137**^{V}.

The following itemized list of elements describes further embodiments of the present invention.

In the application, unless specified otherwise, the terms "comprising", "comprise", and grammatical variants thereof, are intended to represent "open" or "inclusive" language such that they include recited elements but also permit inclusion of additional, nonexplicitly recited elements.

As used herein, the term "about", in the context of concentrations of components of the formulations, typically means +/- 5% of the stated value, more typically +/- 4% of the stated value, more typically +/- 3% of the stated value, more typically, +/- 2% of the stated value, even more typically +/- 1% of the stated value, and even more typically +/- 0.5% of the stated value.

Throughout this disclosure, certain embodiments may be disclosed in a range format. The description in range format is merely for convenience and brevity and should not be construed as an inflexible limitation on the scope of the disclosed ranges. Accordingly, the description of a range should be considered to have specifically disclosed all the possible sub-ranges as well as individual numerical values within that range. For example, description of a range such as from 1 to 6 should be considered to have specifically disclosed sub-ranges such as from 1 to 3, from 1 to 4, from 1 to 5, from 2 to 4, from 2 to 6, from 3 to 6 etc., as well as individual numbers within that range, for example, 1, 2, 3, 4, 5, and 6. This applies regardless of the breadth of the range.

It will be apparent that various other modifications and adaptations of the invention will be apparent to the person skilled in the art after reading the foregoing disclosure,

without departing from the spirit and scope of the invention; and it is intended that all such modifications and adaptations come within the scope of the appended claims.

Reference Numerals

100,100^{I},100^{II},100^{III},100^{IV}	grip-twist control device
101,101^{III},101^{IV}	housing body
103,103^{II},103^{III}	annular disc
105,105^{IV},105^{V}	rotating part
107,107^{III}, 107^{IV},107^{V}	ring
109,109^{IV}	cylindrical extension
111	housing annulus
113	recess
115,115^{III}	cable retainer
116,116^{II},116^{III}	annular magnet
117,117^{IV}	protrusion
118,118^{II}	circular dimple
119,119^{IV}	retaining profile
120,120^{II}	concentric groove
121,121^{IV}	securing profile
123,123^{V}	groove
125,125^{V}	collar
127	outside diameter
129	inner hollow cavity
131	circular tool
133	annular ring
135	retainer spring
137,137^{III},137^{IV},137^{V}	grip part
139	edge of cable hanger
141,141^{III}	cable hanger
143	knob

145	angulated rim

Cleaned copy of amended complete specification

I CLAIM

1. A grip-twist control device for mounting in a grip region of a handlebar, the grip-twist control device comprises:

- a housing body having a cylindrical extension with at least a protrusion at an end of the cylindrical extension;
- an annular disc having a first side with a plurality of circular dimples indented around its periphery and a second side having a flat surface;
- a rotating part having a cable retainer proximal to the housing body and a grip part distal to the housing body interposed between the housing body and a ring, and
- a ring having at least one securing profile for securing to the at least one protrusion at the cylindrical extension of the housing body; characterised in that an annular magnet is mounted at an inner hollow cavity of the cable retainer, the annular magnet provides an attraction force to the annular disc with the circular dimples, wherein the attraction force of the annular magnet with the annular disc creates a grip strength that holds a cable ball of a tension cable in a fixed position maintaining a fixed speed of the revolution on a motor engine.

2. The grip-twist control device of claim 1, wherein the housing body is fixed to the handlebar, the housing body having the cylindrical extension surrounding the handlebar and a housing annulus having a recess.

3. The grip-twist control device of claim 1, wherein the ring is positioned at the distal end of the rotating part and connected to the cylindrical extension of the housing body.

4. The grip-twist control device of claim 1, wherein the cylindrical extension having ~~a~~ the at least one protrusion extending from one end, the at least one protrusion a plurality of retaining profiles for coupling the ring, and the at least one protrusion and retaining profiles do not exceed an outer diameter of the cylindrical extension.

5. The grip-twist control device of claim 2, wherein the rotating part has the cable retainer and the grip part mounted on the cylindrical extension by rotating around the cylindrical extension, the housing annulus at least partially surrounding the cable retainer.

6. The grip-twist control device of claim 2, wherein the annular disc having connecting the circular dimples is located in the recess of the housing annulus.

7. The grip-twist control device of claim 5, wherein the annular disc is located in a groove of the distal end of the grip part.

8. The grip-twist control device of claims 1, wherein magnet has a knob supported by circular dimples.

9. The grip-twist control device of claim 5, wherein the rotating part having the cable retainer has an inner hollow cavity, and the annular magnet is located at the inner hollow cavity.

10. The grip-twist control device of claim 2, wherein a circular tool having a hole in the centre and having a saw tooth periphery is located in the recess of the housing annulus.

11. The grip-twist control device of claim 10, wherein the circular tool is non-rotatable, the hands-free grip-twist control device further comprises at the cable retainer of the rotating part a rotatable annular ring having a cable hanger with an edge, and the edge cooperates with the circular tool to adjust a position of the annular ring relative to the circular tool.

12. The grip-twist control device of claim 11, further comprising a retaining coil at a surface of the rotatable annular ring opposite to a surface of the rotatable annular ring having the cable hanger with an edge.

13. The grip-twist control device of claim 1, wherein the cable retainer has a hole disposed in the centre thereof, with a square tooth periphery surrounding the hole.

14. The grip-twist control device of claim 13, wherein the grip part has a protruded disposed in the centre at one end proximal to the cable retainer with at least one corresponding square tooth periphery and a cable hanger on at least one of the square teeth and mounted into the square tooth periphery at the cable retainer.

15. The grip-twist control device of claim 1, wherein each of the at least one protrusion has a limited spring travel in a radial direction.

16. The grip-twist control device of claim 4, wherein the retaining profiles are capable of being joined to and released from a plurality of securing profiles on the ring.

17. The grip-twist control device of claim 4, wherein the retaining profiles are openings in the protrusions.

18. The grip-twist control device of claim 1, wherein the protrusions have a configuration such that the protrusions are connected to and released from the ring when the grip-twist control device is mounted and is not mounted onto the handlebar, respectively.

19. The grip-twist control device of claim 16, wherein the securing profiles are released from the retaining profiles by turning the ring relative to the cylindrical extension.

20. The grip-twist control device of claim 1, wherein the rotating part is secured in an axial position by the housing body at one end and an end face of the ring at the other end.

21. The grip-twist control device of claim 1, wherein the rotating part is surrounded by the grip part made from a rubber-elastic material and fixed to the rotating part which is rotational.

22. The grip-twist control device of claim 21, wherein the rotating part is encapsulated by the grip part, thereby attaching it permanently to the rotating part.

23. The grip-twist control device of claim 1, wherein on a side opposite the cable retainer, the grip part has an angulated rim extending beyond an overall length of the rotating part, pointing radially inward and projecting into an outward facing groove in the ring to form an intricate seal.

24. The grip-twist control device of claim 23, wherein the groove of the ring is formed in a collar substantially covering an end of the grip part.

25. The grip-twist control device of claim 1, wherein the outside diameter of the cylindrical extension is designed as a matching support for the rotating of the rotating part without gaps.

26. The grip-twist control device of claim 4, wherein the retaining profiles are T-shaped, and are connected with the correspondingly shaped securing profiles on the ring.

27. The grip-twist control device of claim 26, wherein the securing profiles on the ring are hooks.

28. A method of controlling the speed of a motor engine with a hands-free grip-twist control device for controlling cable tension to a motor engine transmission, comprising:

- gripping a grip part,
- rotating the grip part,
- providing a corresponding cable tension to the motor engine transmission,
- securing a position of the grip part, and
- releasing the position of the grip part.

29. The method of claim 28, wherein means for securing and releasing the position of the grip part is by a tensional force exerted by a retaining coil.

30. The method of claim 28, wherein means for securing and releasing the position of the grip part is by magnetic attraction force between two corresponding magnetic materials.

31. A method of assembling the grip-twist control device according to claims 3 to 6 for controlling tension of a tension cable toa motor engine transmission, comprising:

- sliding the housing body onto a handlebar tube of handlebars of a motorcycle,
- sliding the annular disc into the housing annulus of the housing body,
- sliding the rotating part onto the handlebar tube of the handlebars of the motorcycle,
- pulling the tension cable from a cable inlet to a cable hanger at the cable retainer,
- rotating the cable retainer with an annular magnet to secure the tension cable on itself,
- supporting a cable ball of the tension cable at the circular dimple of the annular disc at the recess of the housing annulus,
- encapsulating the rotating part in the housing body,
- sliding the ring onto the handlebar tube of the handlebars of the motorcycle, and

- securing the housing body, the annular disc and the rotating part with the ring by aligning the retaining profiles at the protrusions with the securing profiles at the ring.

32. A method of assembling the grip-twist control device according to claims 3 to 5 and 11 for controlling tension of a tension cable to a motor engine transmission, comprising:

- sliding the housing body onto a handlebar tube of handlebars of a motorcycle,
- sliding the circular tool with a saw tooth periphery similar to a gear into the housing annulus of the housing body,
- sliding the rotating part onto the handlebar tube of the handlebars of the motorcycle,
- pulling the tension cable from a cable inlet to a cable hanger at the annular ring,
- rotating the cable retainer with the annular ring to secure the tension cable on itself,
- supporting the edge of the cable hanger in between two saw tooth peaks along the periphery of the circular tool located at the recess of the housing annulus,
- encapsulating the rotating part in the housing body,
- sliding the ring onto the handlebar tube of the handlebars of the motorcycle, and
- securing the housing body, the annular ring and the rotating part with the ring by aligning the retaining profiles at the protrusions with the securing profiles at the ring.

33. A method of assembling the grip-twist control device according to claims 2 to 4 and 7 for controlling tension of a tension cable to a motor engine transmission, comprising:

- sliding the housing body onto a handlebar tube of handlebars of a motorcycle,
- sliding the rotating part onto the handlebar tube of the handlebars of the motorcycle,
- pulling the tension cable from a cable inlet to a cable hanger at the cable retainer,

- rotating the cable retainer to secure the tension cable on itself,
- supporting a cable ball of the tension cable at the cable retainer,
- encapsulating the rotating part in the housing body,
- inserting the annular disc with the dimples and concentric groove into the grip part of the rotating part,
- inserting an annular magnet with a knob into the ring,
- having the knob rest on one of the dimples of the annular disc,
- sliding the ring onto the handlebar tube of the handlebars of the motorcycle, and
- securing the housing body, the annular disc and the rotating part with the ring by aligning the retaining profiles at the protrusions with the securing profiles at the ring.

34. A method of assembling and disassembling the grip-twist control device according to claims 2 to 5 and 14 for controlling tension of a tension cable to a motor engine transmission, comprising:

- sliding the housing body onto a handlebar tube of handlebars of a motorcycle,
- sliding the cable retainer having the centre hole with the square tooth periphery onto the handlebar tube of the handlebars of the motorcycle,
- sliding the grip part having the protruded centre hole with the corresponding square tooth periphery and inserting it in the cable retainer,
- pulling a tension cable from a cable inlet to a cable hanger at the grip part,
- sliding the ring onto the handlebar tube of the handlebars of the motorcycle, and
- securing the housing body, the annular disc and the rotating part with the ring by aligning the retaining profiles at the protrusions with the securing profiles at the ring.

35. The method of claim 28, wherein means for securing and releasing the position of the grip part comprises a cable hanger mechanically connected to a cable having a cable tension, and a non-rotatable fixed cable retainer having a plurality of square teeth

at an inner circular periphery thereof, the cable hanger being rotatable within the circular periphery and engaged in a gap between two adjacent square teeth.

36. A hands-free grip-twist control device for mounting in a grip region of a handlebar of a motorcycle, the hands-free grip-twist control device comprises:

- a housing body having a cylindrical extension with at least one protrusion at an end of the cylindrical extension;
- a non-rotatable circular tool with a hole in the centre, the hole's diameter is at least the outside diameter of the cylindrical extension, wherein the circular tool having a saw tooth periphery located in a recess at a housing annulus;
- a rotating part having a cable retainer proximal to the housing body and a grip part distal to the housing body;
- a ring having at least one securing profile for securing to the at least one protrusion at the cylindrical extension of the housing body; and
- an annular ring of non-magnetic characteristics mounted at the inner hollow cavity the cable retainer, the annular ring has a retainer spring that exerts a constant tension on a cable hanger pushing against the saw tooth periphery of the circular tool, wherein the cable hanger has an edge that can fit in between two saw tooth peaks along the periphery, the each saw tooth along the periphery of the circular tool has two surfaces converging at a point, wherein the two surfaces allow smooth movement of the cable hanger edge from one tooth to the adjacent tooth, the saw tooth provides a support on the edge of the cable hanger causing the cable retainer from rotating and fixing the tension cable.

37. A hands-free grip-twist control device for mounting in a grip part of a handlebar, the grip-twist control device comprises:

- a housing body having a cylindrical extension with at least one protrusion at an end of the cylindrical extension;
- a rotating part having a cable retainer proximal to the housing body and a grip part distal to the housing body, and

- a ring having at least one securing profile for securing to the at least one protrusion at the cylindrical extension of the housing body;
- a annular magnet located at the ring; and
- an annular disc with a plurality of dimples and concentric groove is located at the grip part end of the rotating part, wherein the annular magnet has a knob;

wherein the annular magnet provides an attraction force with the annular disc, the attraction magnetic force causes the grip part to be non-rotatable.