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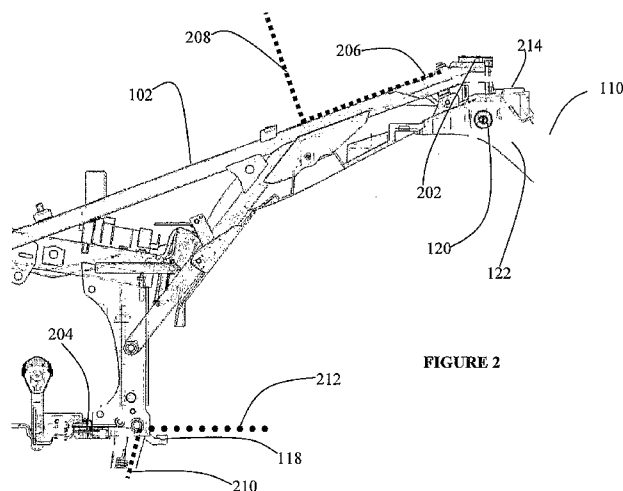


FIGURE 2

(57) Abstract: An anti-theft device for a two-wheeled vehicle (100) is described. The anti-theft device includes a main lock (120), a first locking mechanism (202), and a second locking mechanism (204). The main lock (120) further includes a cam (314) that can be rotated by a key (302) in a first direction (304) or a second direction (306). When rotated in the first direction (304), the cam (314) actuates the first locking mechanism (202). Similarly, when rotated in the second direction (306), the cam (314) actuates the second locking mechanism (204). The first locking mechanism (202), on actuation unlocks a rider seat (114) of said two-wheeled vehicle (100). On the other hand the second locking mechanism (204) on actuation locks a centre stand (118) of said two-wheeled vehicle (100).



ANTI-THEFT DEVICE FOR TWO-WHEELED VEHICLES

TECHNICAL FIELD

The subject matter described herein, in general, relates to an anti-theft device for a two-wheeled vehicle and in particular, relates to a locking mechanism for a rider seat and
5 a centre stand of the two-wheeled vehicle.

BACKGROUND

Generally, two-wheeled vehicles or two-wheelers are prone to theft because of their relatively small size. Also, these vehicles can easily be dismantled by a miscreant and individual parts can be stolen if the vehicle is left unattended for some time at an unsafe or
10 isolated place. Conventionally, a two-wheeled vehicle is safeguarded against theft by a steering lock mechanism present in the steering system of the vehicle. Although locking of the steering system provides basic safety to the vehicle, however, it does not ensure fool proof security.

Another traditional way to secure a two-wheeled vehicle is to lock the centre stand
15 on which the vehicle rests. This provides additional security to the two-wheeled vehicle as it makes the vehicle immobile. The centre stand is locked with the help of an additional locking device such as a pad lock or an integrated centre stand locking device. In such an anti-theft arrangement, the rider of the vehicle has to maintain a separate key for the centre stand lock in addition to having a steering lock key. Further, to lock or unlock the centre
20 stand, the rider has to bend over to access the lock, which sometimes becomes cumbersome. For example, in a packed parking lot, the rider may be forced to leave the centre stand unlocked due to lack of sufficient space around the two-wheeled vehicle for him or her to bend over and lock the centre stand.

Further, if pad locks are used, they have to be separately purchased and carried as
25 an accessory since they are not an integral part of conventional two-wheeled vehicles. Therefore, additional locking devices such as the pad locks are not always user friendly and sometimes discourage the rider from using them.

SUMMARY

The subject matter described herein is directed towards an anti-theft device for a two-wheeled vehicle.

According to one embodiment of the present subject matter, the anti-theft device for the safety of the two-wheeled vehicle, includes a main lock, a first locking mechanism, and a second locking mechanism. The first locking mechanism locks the rider seat at a substantially horizontal position and, on actuation, unlocks the rider seat. On the other hand, the second locking mechanism, on actuation, locks the centre stand at a substantially vertical position, thereby making the two-wheeled vehicle immobile.

The main lock is fitted to a fender near a rear wheel and is used to operate both the first locking mechanism and the second locking mechanism. The main lock includes a cam such as a double slotted split cam. The main lock is connected to the first locking mechanism and the second locking mechanism through a first connecting means and a second connecting means, respectively. The first connecting means and the second connecting means move in accordance with the cam. The cam, when rotated by an external device in a first direction, actuates and unlocks the first locking mechanism and, when rotated in a second direction, which is opposite to the first direction, actuates and locks the second locking mechanism.

Thus, the main lock, disposed at a convenient location on the fender of the two-wheeled vehicle, provides for conveniently securing the two-wheeled vehicle. Since the main lock is connected to both the first locking mechanism and the second locking mechanism, the rider can conveniently secure the two-wheeled vehicle by operating only the main lock. Moreover, the rider of the two-wheeler does not have to maintain separate keys for separate locks.

These and other features, aspects, and advantages of the present subject matter will be better understood with reference to the following description and appended claims. This summary is provided to introduce a selection of concepts in a simplified form. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

BRIEF DESCRIPTION OF DRAWINGS

The above and other features, aspects, and advantages of the subject matter will be better understood with regard to the following description, appended claims, and accompanying drawings where:

5 **Fig.1** illustrates a side view of a two-wheeled vehicle having an anti-theft device, according to one embodiment.

Fig.2 illustrates a side view of the frame of the two-wheeled vehicle, having the anti-theft device integrated thereto as referred in **FIG.1**.

10 **Fig.3A** illustrates a perspective view of a main lock of the anti-theft device, according to one embodiment.

Fig.3B illustrates a sectional view of a double slotted split cam of the main lock, at a neutral position.

Fig.3C illustrates a sectional view of the double slotted split cam of the main lock, at a first locking position.

15 **Fig.3D** illustrates a sectional view of the double slotted split cam of the main lock, at a second locking position.

Fig.4A illustrates a sectional view of a second locking mechanism of the anti-theft device in an unlocked condition, according to an embodiment.

20 **Fig.4B** illustrates a sectional view of the second locking mechanism of the anti-theft device in a locked condition, according to another embodiment.

DETAILED DESCRIPTION

The subject matter described herein is directed to an anti-theft device for a two-wheeled vehicle, interchangeably referred to as a two-wheeler hereinafter. The two-wheeler as described herein includes a frame resting on a rear and a front wheel, a steering
25 handle, a centre stand, and a rider seat.

According to one embodiment, the anti-theft device includes a main lock, a first locking mechanism, and a second locking mechanism. The main lock is fitted to a fender

near the rear wheel. The main lock further includes a cam such as a double slotted split cam. The main lock is connected to the first locking mechanism and the second locking mechanism through a first connecting means and a second connecting means, respectively. The first connecting means and the second connecting means move in accordance with the cam. The cam, when rotated in a first direction and a second direction opposite to the first direction, actuates the first and the second locking mechanisms, respectively.

The first locking mechanism is provided on the frame and in the vicinity of the rider seat. The rider seat is disposed substantially above the rear wheel and is pivoted to the frame of the two-wheeled vehicle. The first locking mechanism locks the rider seat in a substantially horizontal position. Further, on actuation, the first locking mechanism unlocks the rider seat.

The second locking mechanism is provided in the proximity of the centre stand of the two-wheeled vehicle. The centre stand is disposed between the two wheels of the two-wheeled vehicle. The second locking mechanism, on actuation, locks the centre stand in a substantially vertically operable position supporting the vehicle in a parking position, thereby making the two-wheeled vehicle immobile.

Fig.1 illustrates a perspective side view of a two-wheeled vehicle **100**. According to an embodiment, the two-wheeled vehicle or the two-wheeler **100** includes a frame **102** that supports a front wheel **104** on a front end **106** and a rear wheel **108** on a rear end **110** of the two-wheeler **100**. A steering means **112**, which is also supported by the frame **102**, is connected to the front wheel **104**. A rider seat **114** is disposed substantially above the rear wheel **108** and is pivoted to an utility box **116** disposed underneath. Also, a centre stand **118** is disposed between the front wheel **104** and the rear wheel **108** of the two-wheeled vehicle **100**.

In order to safely park the two-wheeled vehicle **100**, a main lock **120** is provided which is fitted to a fender **122** of the two-wheeled vehicle **100** at the rear end **110**. The main lock **120** is used to lock and unlock both the rider seat **114** and the centre stand **118** using a single locking mechanism, which will be discussed in detail in the later part of the description.

Fig.2 illustrates a side view of the frame **102** of the two-wheeled vehicle **100**, as shown in **Fig.1**. The two-wheeled vehicle **100** includes an anti-theft device that includes

the main lock 120, a first locking mechanism 202, and a second locking mechanism 204. The main lock 120 is fitted on the fender 122 of the two-wheeled vehicle 100 near the rear wheel 108. The main lock 120 separately actuates the first locking mechanism 202 and the second locking mechanism 204 when rotated in a particular direction.

5 The first locking mechanism 202 is provided at the rear end 110 of the frame 102 and in the vicinity of the rider seat 114 (not shown in this figure). The first locking mechanism 202 locks the rider seat 114 in a substantially horizontal position 206 of the rider seat 114. The first locking mechanism 202, on actuation by the main lock 120, unlocks the rider seat 114 so that the rider seat 114 can be brought to a substantially
10 vertical position 208. The rider seat 114, when moved upwards from the substantially horizontal position 206 to the substantially vertical position 208, uncovers the utility box 116 (not shown in this figure). The rider seat 114, when moved downward from the substantially vertical position 208 to the substantially horizontal position 206, gets locked automatically.

15 Further, the second locking mechanism 204 is provided in the vicinity of the centre stand 118 of the two-wheeled vehicle 100. The second locking mechanism 204, on actuation by the main lock 120, locks the centre stand 118 in a substantially vertical position 210, thereby preventing the movement of the centre stand 118 to a substantially horizontal position 212. To unlock the centre stand 118, from the substantially vertical
20 position 210 to the substantially horizontal position 212, the second locking mechanism 204 can be again actuated by the main lock 120. The first locking mechanism 202 and the second locking mechanism 204, also referred to as a seat latch 202 and a stand latch 204 respectively, may be used independent of each other.

 Fig.3A illustrates a perspective view of the main lock 120 of the anti-theft device
25 of the two-wheeled vehicle 100, according to one embodiment of the present subject matter. The main lock 120 is provided with a key hole 300 and is operated by a key 302. The key 302 is used to operate the main lock 120 by turning the key 302 inside the keyhole 300 in a first direction 304 or in a substantially opposite second direction 306. For purposes of discussion, the first direction 304 is a clockwise direction, while the second
30 direction 306 is an anti-clockwise direction.

The key **302** rotates to a first position **308** from a neutral position **310** when turned in the first direction **304**. Similarly, the key **302** rotates to a second position **312** from the neutral position **310** when turned in the second direction **306**. The neutral position **310** is disposed between the first position **308** and the second position **312**. In one embodiment, the first position **308** can be, for example, at an angular displacement of 70 degrees in the first direction **304** from the neutral position **310**. Further, the second position **312** can be, for example, at an angular displacement of 90 degrees in the second direction **306** from the neutral position **310**. The key **302** can also be used to operate a steering and ignition system of the two-wheeled vehicle **100**.

Further, the main lock **120** is connected to the first locking mechanism **202** and the second locking mechanism **204**. The aforesaid connections are made such that the first locking mechanism **202** and the second locking mechanism **204** are actuated when the key **302** is rotated inside the keyhole **300** towards the first position **308** and towards the second position **312** respectively.

Fig.3B illustrates a sectional view of a double slotted split cam **314** of the main lock **120** of the two-wheeled vehicle **100**, in the neutral position **310**. The main lock **120**, provided with the double slotted split cam **314**, is connected to the first locking mechanism **202** and the second locking mechanism **204** by a first connecting means **316** and a second connecting means **318** respectively. The connections are made such that the first connecting means **316** and the second connecting means **318** move in accordance with the double slotted split cam **314**. In a preferred embodiment, a first cable **316** and a second cable **318** can be used as the first connecting means **316** and the second connecting means **318**, respectively. In one implementation of the above embodiment the first cable **316** and the second cable **318** are Single cables. In another implementation of the above embodiment the first cable **316** and the second cable **318** are Split cables.

Fig.3C illustrates a sectional view of the double slotted split cam **314** of the main lock **120** of the two-wheeled vehicle **100**, in the first position **308**. Turning the key **302** to the first position **308** rotates the double slotted split cam **314** in the clockwise direction **304**, thus pulling the first cable **316**. The first cable **316**, in turn, actuates and unlocks the first locking mechanism **202**, which otherwise is always in a locked condition.

Fig.3D illustrates a sectional view of the double slotted split cam **314** of the main lock **120** of the two-wheeled vehicle **100**, in the second position **312**. Turning the key **302** to the second position **312** rotates the double slotted split cam **314** in the anti-clockwise direction **306**, thus pulling the second cable **318**. The second cable **318** then actuates and
5 locks the second locking mechanism **204**, which otherwise is always in an unlocked condition, thereby locking the centre stand **118** in the substantially vertical position **210**. Locking the centre stand **118** in the substantially vertical position **210** makes the two-wheeled vehicle **100** immobile. To move the two-wheeled vehicle **100** the centre stand **118** can be unlocked by turning the key from the second position **312** back to the neutral
10 position **310**. Turning the key from the second position **312** back to the neutral position **310** releases the pulled second cable **318** and thus unlocks the second locking mechanism **204**.

Fig.4A illustrates a sectional view of the second locking mechanism **204** in an unlocked condition. The second locking mechanism **204** includes a plunger **400**, a post
15 **402** fixed to the plunger **400**, and a spring **404** for returning the plunger **400** back to its original position after unlocking. The post **402** connects the plunger **400** to the second cable **318** through a lever or linkage **406** such that when the double slotted split cam **314** pulls the second cable **318**, the second cable **318** in turn pulls the plunger **400**, thus actuating the second locking mechanism **204**.

Fig.4B illustrates a sectional view of the second locking mechanism **204** in a
20 locked condition. The second locking mechanism **204** is actuated to the locked condition when the double slotted split cam **314** pulls the second cable **318**. The second cable **318** in turn, pulls the plunger **400** such that the plunger **400** slides in the guiding means **408** and enters inside a stopper **410** provided in the centre stand **118**. Thus, the centre stand **118**
25 gets locked in the substantially vertical position **210**.

The present subject matter thus provides an easy and convenient to use anti-theft device. Using the main lock **120** for actuating the second locking mechanism **204** makes it convenient for the rider to lock the centre stand **118** without bending from his normal sitting position as the main lock **120** is fitted on the fender **122** near the rear end **110** of the
30 two-wheeled vehicle **100**.

Further, a single key **302** can be used to operate the main lock **120** and the steering and ignition system of the two-wheeled vehicle **100**, thus preventing any need of additional keys for the main lock **120**. Moreover, as the main lock **120** actuates the entire anti-theft device, thus no separate keys are required for the first locking mechanism **202**
5 and the second locking mechanism **204**.

In addition, no separate locking devices are required to be carried as accessories since the anti-theft device as described herein is integrated with the fender **122** of the two-wheeled vehicle **100**.

While certain features of the claimed subject matter have been illustrated and
10 described herein, many modifications, substitutions, changes, and equivalents will now occur to those skilled in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes that fall within the true spirit of the claimed subject matter.

I/We Claim:

1. An anti-theft device for a two-wheeled vehicle (100), said anti-theft device comprising:
 - a main lock (120);
 - 5 a first locking mechanism (202) for locking a rider seat (114) of said two-wheeled vehicle (100); and
 - a second locking mechanism (204) for locking a centre stand (118) of said two wheeled vehicle (100);
 - characterized in that,
 - 10 said main lock (120) comprises a cam (314) for actuating said first locking mechanism (202) and said second locking mechanism (204).
2. The anti-theft device as claimed in claim 1, wherein said cam (314) actuates said first locking mechanism (202) and said second locking mechanism (204) through a
15 first connecting means (316) and a second connecting means (318) respectively.
3. The anti-theft device as claimed in claim 1, wherein said cam (314) is a double slotted split cam.
- 20 4. The anti-theft device as claimed in claim 1, wherein said cam (314) is operable using a key (302).
5. The anti-theft device as claimed in claim 2, wherein said first connecting means (316) and second connecting means (318) are single cables or split cables.
- 25 6. The anti-theft device as claimed in claim 1, wherein said main lock (120) is provided at a fender (122) on a rear end (110) of said two-wheeled vehicle (100).
7. The anti-theft device as claimed in claim 2, wherein said second locking
30 mechanism (204) comprises:
 - a plunger (400); and
 - a post (402) fixed on said plunger (400) and connected to an end of said second connecting means (318).

8. The anti-theft device as claimed in claim 7, wherein said second locking mechanism (204) comprises:
- 5 a stopper (410) provided on the centre stand (118), such that said plunger (400) is inserted in said stopper (410) by the actuation of second locking mechanism (204); and
- a guiding means (408) for guiding said plunger (400) inside said stopper (410).
9. A method for operating an anti-theft device for a two-wheeled vehicle (100), said method comprising:
- 10 rotating a cam (314) in a first direction (304) to actuate a first locking mechanism (202); and
- rotating said cam (314) in a second direction (306), to actuate a second locking mechanism (204).
- 15 10. The method as claimed in claim 9, wherein said first locking mechanism (202), on actuation, unlocks a rider seat (114) of said two-wheeled vehicle (100).
11. The method as claimed in claim 9, wherein said second locking mechanism (204),
- 20 on actuation, locks a centre stand (118) of said two-wheeled vehicle (100).
12. The method as claimed in claim 9, wherein said first direction (304) is a clockwise direction and said second direction (306) is an anticlockwise direction.

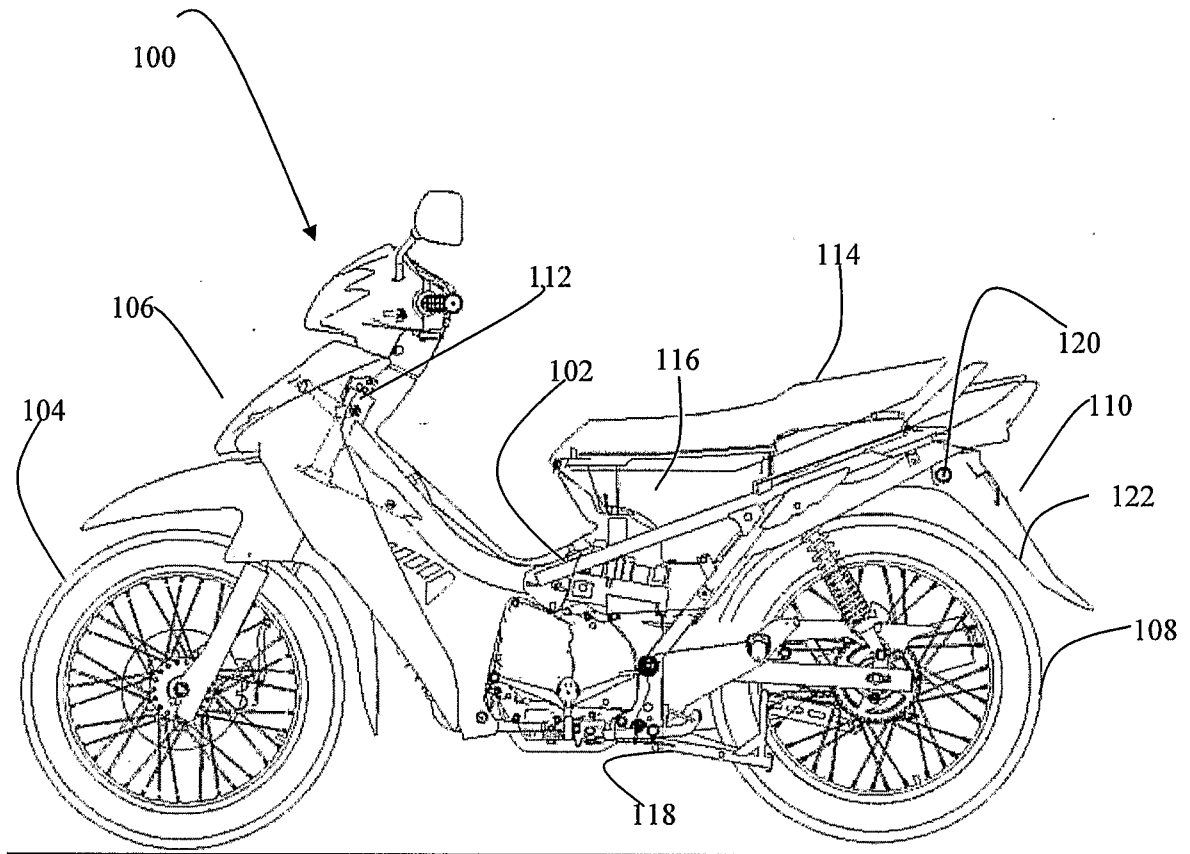


FIGURE 1

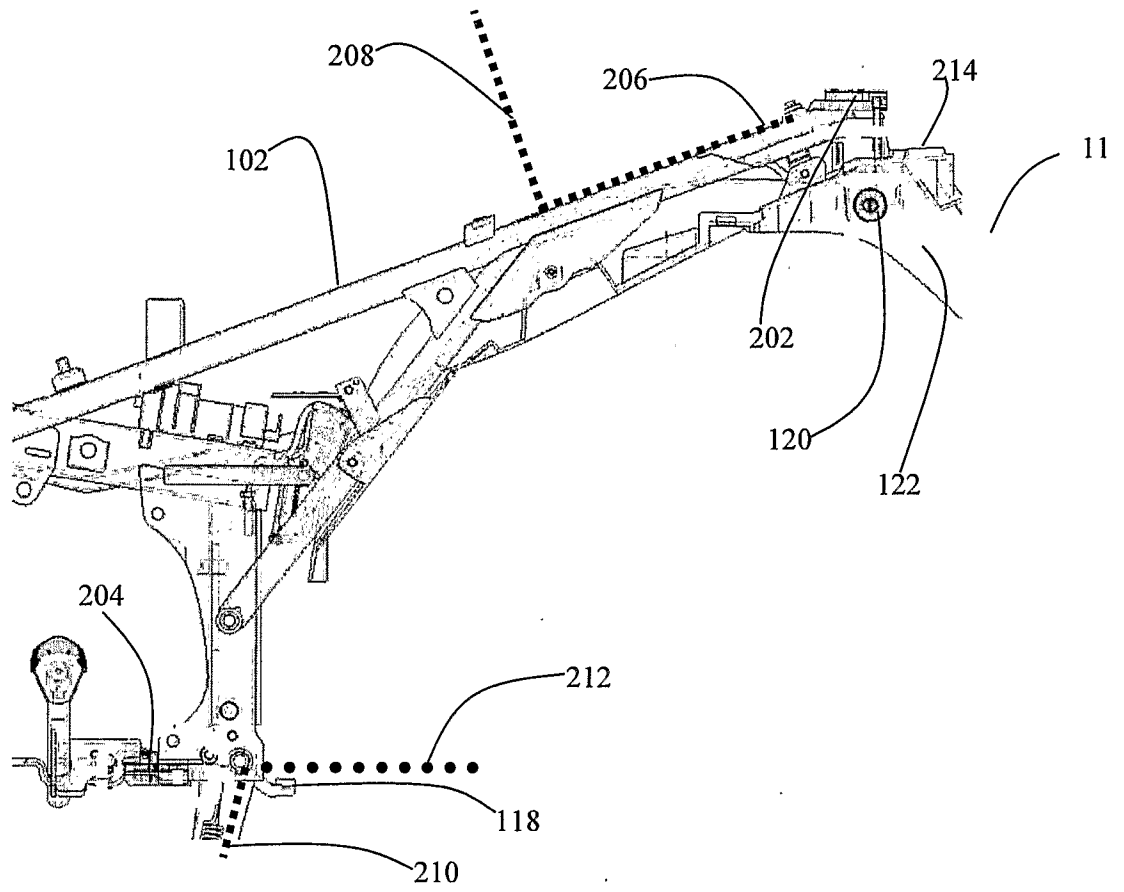


FIGURE 2

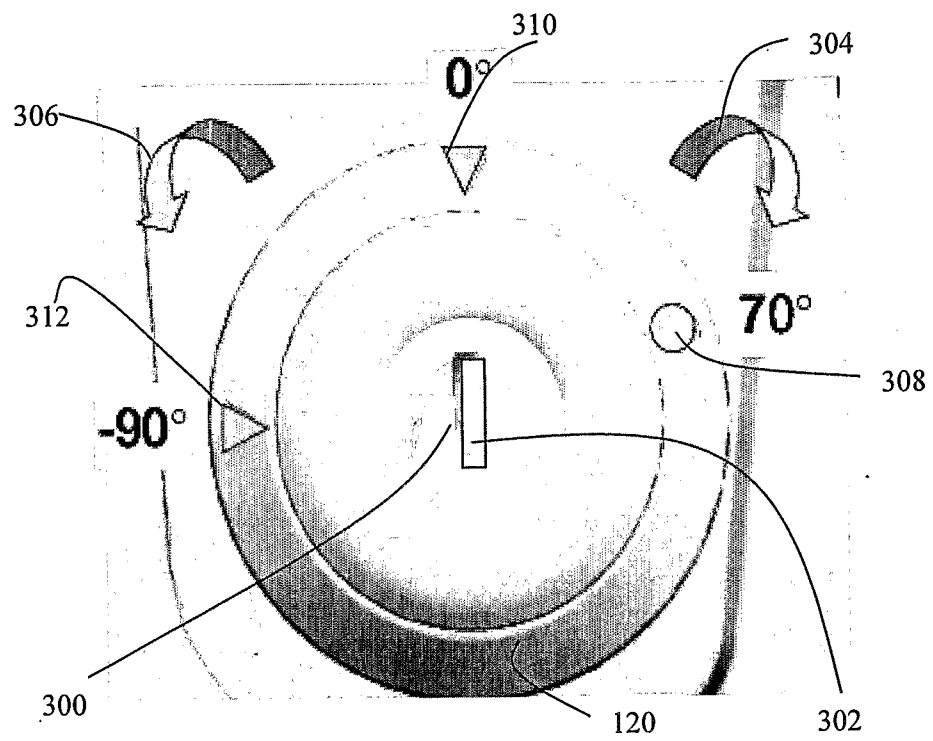
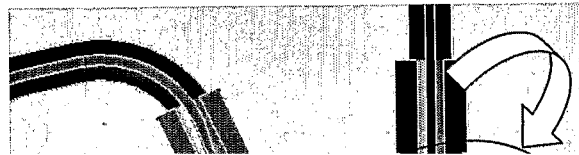


FIGURE 3A



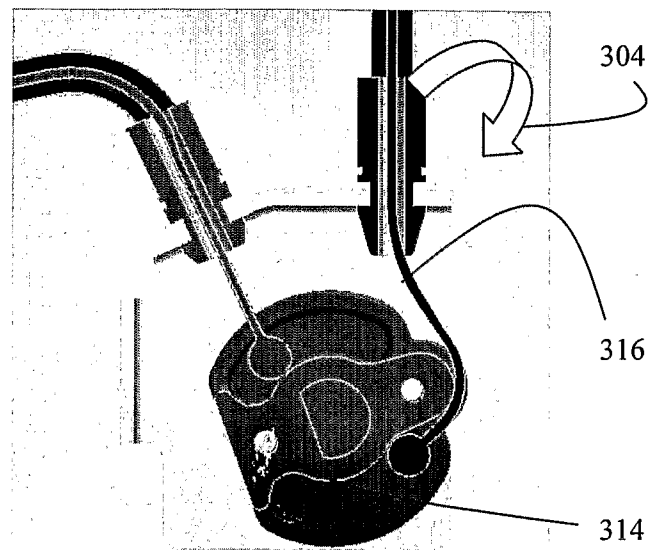
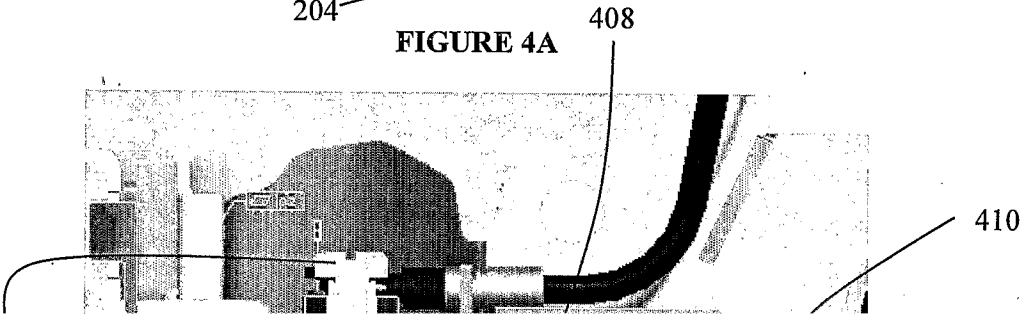
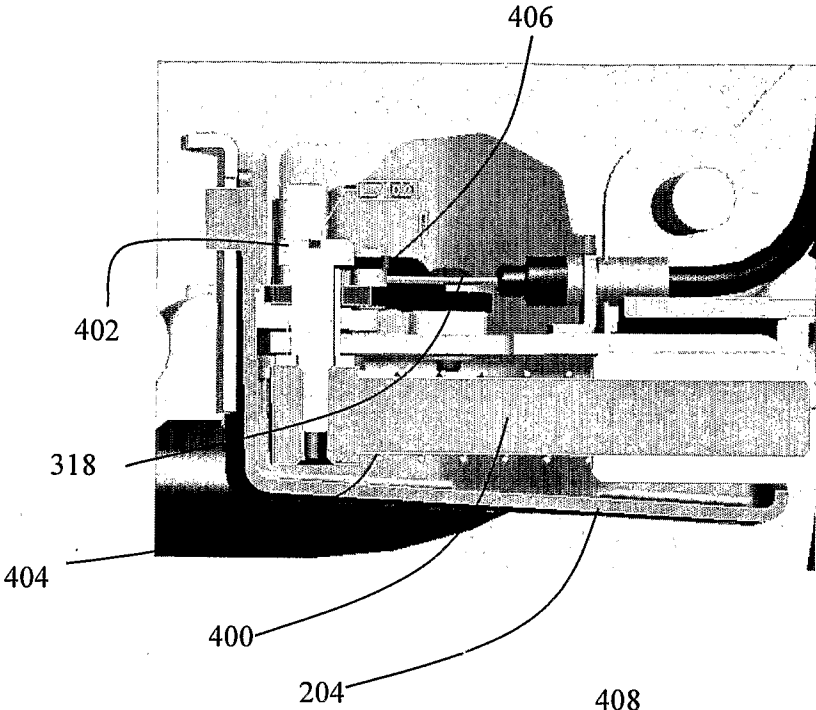


FIGURE 3C





INTERNATIONAL SEARCH REPORT

International application No

PCT/IN2009/000121

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B62H5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 B62H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 32 11 367 A1 (GELHARD EGON) 6 October 1983 (1983-10-06)	9,11,12
Y	abstract; figures page 8, last paragraph - page 9, line 1	1-8,10
Y	US 2007/068201 A1 (FUJIMOTO YUKINORI [JP] ET AL) 29 March 2007 (2007-03-29) abstract; figures	1-8,10
Y	WO 2007/099501 A (C M S R L [IT]; CAPUANO ERNESTO [IT]) 7 September 2007 (2007-09-07) abstract; figures	7,8
A	EP 1 388 489 A (BIRIA AG [DE]) 11 February 2004 (2004-02-11) abstract; figures	1,9
	----- -/--	

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☒ See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No

PCT/IN2009/000121

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 418 117 A (YAMAHA MOTOR CO LTD [JP]) 12 May 2004 (2004-05-12) abstract; figures -----	1,9
A	GB 2 284 188 A (HONE PETER JOHN [GB]) 31 May 1995 (1995-05-31) abstract; figures -----	1,9
A	DE 20 2004 012679 U1 (TAUSELT WERNER [DE]) 10 March 2005 (2005-03-10) abstract -----	1,9
A	EP 1 155 947 A (ORBEA S COOP LTDA [IT]) 21 November 2001 (2001-11-21) abstract; figures -----	1,9

INTERNATIONAL SEARCH REPORT

International application No

PCT/IN2009/000121

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 3211367	A1	06-10-1983	NONE	
US 2007068201	A1	29-03-2007	JP 2007062561 A	15-03-2007
WO 2007099501	A	07-09-2007	IT RM20060041 U1	02-06-2006
EP 1388489	A	11-02-2004	DE 10236247 A1	04-03-2004
			JP 2004067088 A	04-03-2004
EP 1418117	A	12-05-2004	CN 1532108 A	29-09-2004
			JP 4229429 B2	25-02-2009
			JP 2004161032 A	10-06-2004
			TW 232825 B	21-05-2005
GB 2284188	A	31-05-1995	NONE	
DE 202004012679 U1		10-03-2005	NONE	
EP 1155947	A	21-11-2001	NONE	