

"CASE FOR MOTOR VEHICLES WITH FACILITATED OPENING DEVICE"

The present invention refers to a case of the type suitable for removably coupling on a support plate mounted on a motor
5 vehicle.

In the field many bags are known provided with means for removable engagement on suitable fastening plates mounted on the motor vehicle. Often, such bags comprise a sliding bolt element that snaps onto or into a suitable projection
10 in the plate to stably fix the case to the plate. A button mechanism, possibly equipped with a lock, allows the bolt to be withdrawn to unlock the case.

The general purpose of the present invention is to provide a case equipped with a robust opening/closing mechanism that
15 also provides advantageous characteristics of easier opening.

In particular, a purpose of the invention is also to provide a mechanism that allows a pre-opening movement of the cover to ensure that the user can easily open the cover of the case. Advantageously, according to a variant embodiment the system
20 also allows the cover to be easily opened through the use of an electromagnetic actuator. In such a case, it is possible to make a case equipped with a remote control opening system.

According to the principles of the present invention, the closing system, by using the same key, can also manage the
25 possibility of hooking/unhooking the case from the support fixed to the motorcycle.

In view of the purposes of the invention it has been thought of to make, according to the invention, a case for motor vehicles, equipped with means for removably fastening to a

support plate on the motor vehicle, comprising a base part and a cover hinged together and equipped with a locking mechanism able to be controlled with control means from a first position holding the cover in closed position to a second position releasing the cover to allow it to be opened, preferably also comprising a lock that can be controlled to prevent a control to open the cover, characterized in that it comprises means for partially shifting the cover from the base part that act positively on the closed cover at the passage of the locking mechanism from the holding position to the release position.

In order to clarify the explanation of the innovative principles of the present invention and its advantages compared to the prior art hereafter we shall, with the help of the attached drawings, describe a possible example embodiment applying such a principle. In the drawings:

- figure 1 represents a schematic perspective view of a case according to the invention, coupled with the plate for fastening to the motorcycle;
- figure 2 represents a partial schematic view of the case of figure 1 that shows the cover of the case in partially raised position;
- figure 3 represents a partial schematic view from the inside of the lock mechanism of the case in open condition;
- figure 4 represents a schematic view similar to the one of figure 3, but with the mechanism in closed condition;
- figure 5 represents a partial detail of the release system of a handle of the case;
- figure 6 and 7 represent partial and section schematic

views of the case of figure 1, with the mechanism in closed and half-open condition, respectively;

- figure 8 is a schematic view similar to the one of figure 6, but of a variant of the mechanism with electromagnetic actuator and remote control.

With reference to the figures, figure 1 shows a case, generically indicated with 10, suitable for coupling with motor vehicles and made according to the principles of the present invention.

- 10 By case we mean any suitable type of container equipped with a body and a cover hinged together. The type shown is generally known as a topcase, formed from a bottom shell 11 that makes the body of the case and a top shell 12 that makes the cover and hinged at the back to the bottom shell.
- 15 The case is equipped at the bottom with a rigid base on which there are conventional means for removably attaching to a plate 13 fixed to the motor vehicle. The plate and the fastening means are *per se* known and easily conceived by the man skilled in the art. Therefore, they shall not be
- 20 described or shown in detail here. As shall become clear hereafter the attachment means generically comprise passive couplings, for example using a clasp, and a latch locking system, able to be actuated to allow a disengagement movement of the case from the passive couplings and allow the case
- 25 to be removed from the plate.

The case is equipped with a handle 14, which advantageously also makes thrusting means to actuate the opening of the cover, a key lock 15 and a button to release the case from the plate. Advantageously, the lock itself 15 can manage

both the opening of the cover and the release button.

Between cover and base there is a locking mechanism able to be controlled with suitable control means to move it from a first position holding the cover in closed position to a second
5 position releasing the cover to allow it to be opened.

Figure 2 shows a detail of the area of the lock, with the cover slightly open. In such a figure on the cover 12 it is possible to see a pair of hooks 19 that insert into suitable passages 20 on the edge of the bottom shell of the case to
10 be suitably engaged by the locking mechanism.

In figure 3 such a closing mechanism is shown, from the inside of the case, together with the part of the mechanism present in the cover and equipped with hooks 19. In the figures possible protections that make the inside of the
15 case and that protect the mechanisms have been removed.

The locking mechanism comprises means 21 for partially shifting the cover from the base part that act positively on the closed cover at the passage of the locking mechanism from the holding position to the release position.

20 In the described embodiment, the shifting means comprise one or two rotation levers (or rotating forks) 21 oppositely inclined upwards and with open slots 22 that are intended, when the cover is closed, to each receive the bottom end of a respective clasp 19 (shaped with a suitable horizontal
25 pin 23). As can be seen in figure 4, when the cover is closed the hooks 19 rotate the levers 21 in a mirroring fashion, against the action of springs 24, to push them towards a horizontal locking position.

From the comparison of figures 3 and 4 it is clear how such a

rotation of the levers 21 is then maintained by a stop element 25 that allows the movement of the levers towards the release position to be locked or unlocked. Advantageously, the stop element is made with a rocker arm element 25 that
5 rotates around a horizontal hinging axis 26, thanks to the action of a spring 27, to lock the return of the levers 21 towards the release position of figure 3.

To unlock the levers 21 and to open the cover there are control means that advantageously comprise a presser element
10 28, pivoted at the same axis 26 as the rocker arm and that rests on the lower arm of the rocker arm to rotate it towards the position not interfering with the levers 21 when it is pushed towards the inside of the case (advantageously through a suitable push on the handle, as shall become clear
15 hereafter).

Advantageously, there are spring means 17, 18 for pushing between cover and base part to increase the shift of the cover once unlocked. In particular, in the advantageous embodiment shown the cover is equipped with a slider 17
20 that is pushed to elastically project from the edge of the cover by means of springs 18, so as to react against the corresponding edge of the bottom shell of the case. This makes it easier to move the cover open.

Again from the comparison of figures 3 and 4 it can be seen
25 how the lock at the back actuates a rotary bolt 29 that has a radial projection 30 that, with the lock in closed position (figure 4), goes into vertical position and prevents the possibility of the presser moving towards the rocker arm and unlocking the levers.

The button 16 controls the sliding of a slider or sliding bolt 32 that in rest position holds the case on the plate, as shall be made clear hereafter. In the closed position of the lock the rotary bolt 29 also interferes with a projection 31 present on the back of the button 16, so as to prevent it from moving and, consequently, to prevent the case from releasing from the plate by pressing on the button 16.

Advantageously, the handle 14 for lifting the case can be rotated between a rest position, arranged built flush into the wall of the case, and an operative position only after the release of a suitable stop 33 that, when the lock is in unlocked position, is pushed to elastically bend by means of a projection 34 of the bolt 29. Figure 5 schematically shows the action of the projection 34 on the stop 33 to take the end of the stop to a release passage 35 located inside the handle 14, so that the handle can rotate around a pivot 36 thereof thanks to the action of suitable spring means (not shown) and go into operative position withdrawn from the case. A known viscous retarder 37 is advantageously present to brake the movement given by the springs and to make the movement of the handle better. From figure 5 it is also clear how the handle rests on the presser 28 to actuate it. Advantageously, the release of the handle takes place by rotating the key by an angle slightly greater than its stable open position. The schematic sections shown in figures 6 and 7 further clarify the operation of the mechanism made according to the principles of the invention.

In figure 6 the case is in closed condition attached to the support. The support is equipped with passive engagement means

at the back of the case (not shown) and with a clasp 40 that engages in the slider 32 pushed by a spring 41. The handle is in rest position, built flush into the wall of the case.

In the condition with the lock closed, the rotary bolt 29 has the projection 30 locking the presser 28. Moreover, the button 16 cannot be pressed to release the topcase from the support due to the locking of the projection 31. Advantageously, the slider 32 is suitably slidably connected to the button 16 to in any case allow the case to be attached even with the lock closed and the button locked.

In order to open the topcase it is necessary to turn the key (by 85° in the solution shown) towards the open position of figure 3 to allow the rotation of the rocker arm and presser group in this way.

As shown in figure 7, it is thus necessary to press in the central area of the handle and in this way the handle rotates towards the inside of the topcase and impacting with the presser 28 causes it to rotate. The rotating of the presser causes the same rotation of the rocker arm 25 that, in turn rotating towards the outside in its top part, frees the rotation levers 21 that, under the action of the springs 24 rotate and go from the horizontal position to the vertical position.

Going into vertical position, the levers force the hooks 23, and consequently the cover fixedly connected to it, to move vertically and thus to open the case.

In this way a first vertical movement of the cover is generated (equal to about 15 mm in the solution shown). The extent of such movement is determined by the shape of the

rotation levers.

In order to make it easier for the cover to open, the slider 17 also intervenes, pushing on the edge of the case and increasing the space between base and cover. At the moment when the cover starts to open, the slider, thanks to the action of the springs 18, can slide downwards coming out from the cover and, acting upon the horizontal plane of the hinge, pushes the cover further upwards increasing the gap between cover and base (about 30 mm in the embodiment shown) to double to value of that generated by just the action of the rotation levers.

If so desired, the gap between base and cover can be increased or decreased by acting upon the size of the levers and of the slider.

With opening complete, removing the pressure from the handle, the presser, the rocker arm and the handle return automatically into the starting position (the same one that they occupy when the hinge is closed) thanks to the action of the spring 27. It is also possible to open the topcase by making the handle come out from its seat (turning the key by 90° to unlock it) and then by pressing directly upon the presser, advantageously configured like a press key. The withdrawn operative position of the handle is shown with a broken line in figure 7.

In order to close the case it is sufficient to press the cover towards the closed position without needing to act upon any type of linkage. Indeed, by pushing the cover downwards, the bottom ends of the hooks 19 engage the slots of the rotation levers 21 and force them to rotate downwards.

In this rotation movement the rotation levers, thanks to suitable inclined planes, make the rocker arm and presser group rotate until they go back into the closed position.

The closing of the case, given the type of mechanism
5 described, can take place without distinction either with the key in closed or open position.

In the open lock position (figure 7) it is possible to press on the press-key 16 to release the case from the support plate.

10 Figure 8 shows a variant embodiment of the case where an electromagnetic actuator 42 has simply been added, housed in a suitable seat 43 inside the base of the case. The actuator is equipped with a mobile horizontal shaft 44 that, receiving an electrical control impulse, pushes against the top part of
15 the rocker arm 25 that rotates (in this case independently from the presser 28) and, as already described above, frees the rotation levers 21 that, going into vertical position, lift the cover.

When the forward stroke is complete the stem of the actuator
20 automatically returns into the initial position. Consequently, once opening has occurred, the rocker arm thanks to the action of the spring 27 goes back into the original position and sets itself for the closing of the cover that will occur afterwards.

25 The opening with the actuator is totally independent from the key and, therefore, given the type of mechanism, it can take place both with the key in closed position or in open position and, for the same reason, the cover can be closed in the two configurations. For security reasons, the release

of the case from the plate, on the other hand, is always managed by the key.

The actuator can without distinction be powered by batteries or by the 12 V current taken directly from the battery through
5 a suitable connection system.

The electrical opening impulse can be provided in various ways.

Advantageously, it has been thought of to equip the case with a remote control system, comprising a receiver 45 and
10 a transmitter 46. A known radio or infrared remote control system can be used.

It should be noted that the full functionality of the key is maintained in parallel so as to freely intervene even in the case of malfunction or failure of the electronic part.

15 At this point, it is clear how all of the predetermined purposes have been accomplished, providing a case with a strong and reliable opening mechanism that allows easier opening of the case for motor vehicles.

Of course, the description made above of an embodiment
20 applying the innovative principles of the present invention is given as an example of such innovative principles and therefore must not be taken to limit the scope of protection claimed here. For example, the locking mechanism can comprise a single forked lever 21 and a single engagement tooth 19,
25 even if it has been found preferable to use two hooks and two levers, with the spring thrusting element 17 between them, for better closing. Other locking means can be considered, with independent partial shifting spring mechanisms.

Claims

1. A case for motor vehicles, equipped with means for removably fastening to a support plate (13) on the motor vehicle, comprising a base part (11) and a cover (12) hinged together and equipped with a locking mechanism able to be controlled by control means (14, 28) from a first position holding the cover (12) in closed position to a second position releasing the cover (12) to allow it to be opened, the locking mechanism comprising means for partially shifting the cover (12) from the base part (11) that act positively on the closed cover (12) at the passage of the locking mechanism from the holding position to the release position, the case comprising spring means (17, 18) for pushing between cover (12) and base part (11) in the direction to increase the shift between cover (12) and base part (11) when the locking mechanism passes from the holding position to the release position, **characterized in that** the control means comprise manual means (14, 28) controlled by pressing that can be actuated by pushing on a handle (14) for lifting the case when said handle (14) is received in a rest position in the base part (11).
2. Case according to claim 1, **characterized in that** the locking mechanism comprises at least one rotation lever (21) equipped with an open slot (22) and able to be rotated upon command between a position holding a respective clasp (19) fixedly connected to the cover (12) and a position releasing the clasp (19), in the movement from the holding position to the release position the rotation lever (21) pushing the clasp (19) to shift the cover (12) from the base (11), so as to also make the shifting means.
3. Case according to claim 1, **characterized in that** the rotation lever (21) rotates towards the release position upon action of a respective spring (24), a stop element (25) being mobile through the control means (14, 28), between an engagement position and a disengagement position of the lever (21) in holding position to allow the spring movement of the lever (21) towards the release position.

4. Case according to claim 3, **characterized in that** there are two rotation levers (21), rotating in a mirroring fashion towards the release position.
5. Case according to claim 1, **characterized in that** when in rest position the handle (14) is received in a flush seat in the wall of the base part (11).
6. Case according to claim 1, **characterized in that** it also comprises a lock (15) able to be controlled to prevent the cover from being controlled to open, wherein the lock can be actuated to prevent the action of the manual means (14, 28) controlled by pressing.
7. Case according to claim 1, **characterized in that** it also comprises a lock (15) able to be controlled to prevent the cover from being controlled to open, wherein the lock rotates by key between a first stable position for preventing the action of the manual means (14, 28) controlled by pressing and a second stable position that allows the action of the manual means controlled by pressing, and **in that** there are means (33) for holding the handle (14) in the rest position that can be unlocked through a rotation of the lock (15) beyond said second stable position.
8. Case according to claim 1, **characterized in that** it also comprises a lock (15) able to be controlled to prevent the cover from being controlled to open, wherein the lock in a condition preventing the cover (12) from being controlled to open also prevents the unhooking movement of a mechanism (16, 32) for holding the case on the support plate (13).
9. Case according to claim 3, **characterized in that** it comprises an electric actuator (42) that upon command acts upon the stop element (25) to move it towards the disengagement position of the lever (21).
10. Case according to claim 9, **characterized in that** the actuator is controlled through a remote control system (45, 46).