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WO 94/19216 A1 WO 90/05653 A1 US 4076095 A

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(54) A Vehicle Immobiliser

(57) The immobiliser consists of a foot 12, and a guide 20. A support 14 is mounted on the guide 20 such that it may slide along the guide 20. A ratchet mechanism permits the support 14 to move away from the foot 12 along the guide 20, but prevents the support 14 from moving towards the foot 12. The support includes a pair of support plates 48, 52 having apertures 32. A second ratchet mechanism allows a cover 16 to slide towards the support 14, but prevents the cover 16 from sliding away from the support 14. The cover 16 consists of a pair of U-shaped clamping elements 28, 30 with legs 36, 38 received within the apertures 34, 32. Each clamping element 28, 30 bridges a respective control pedal 64, 66 and traps it against a respective support plate 52, 48. A key may be inserted in a lock barrel and rotated clockwise to release the ratchet mechanisms. The device is installed by placing the foot 12 against the floorpan, raising the cover 16 and hence the support 14 until the support 14 is positioned just beneath the control pedals, then depressing the cover 16 to trap the control pedals between the cover 16 and the support 14.

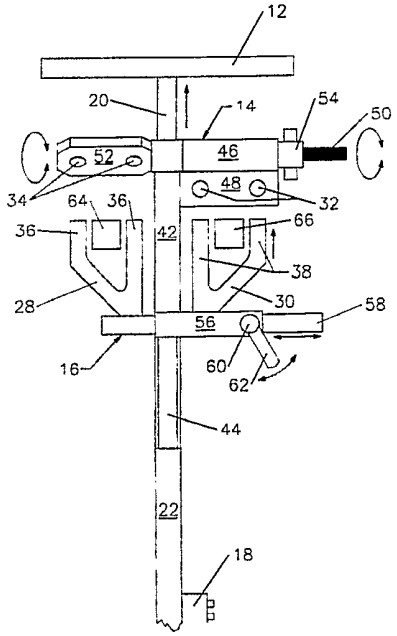

FIGURE 1.

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

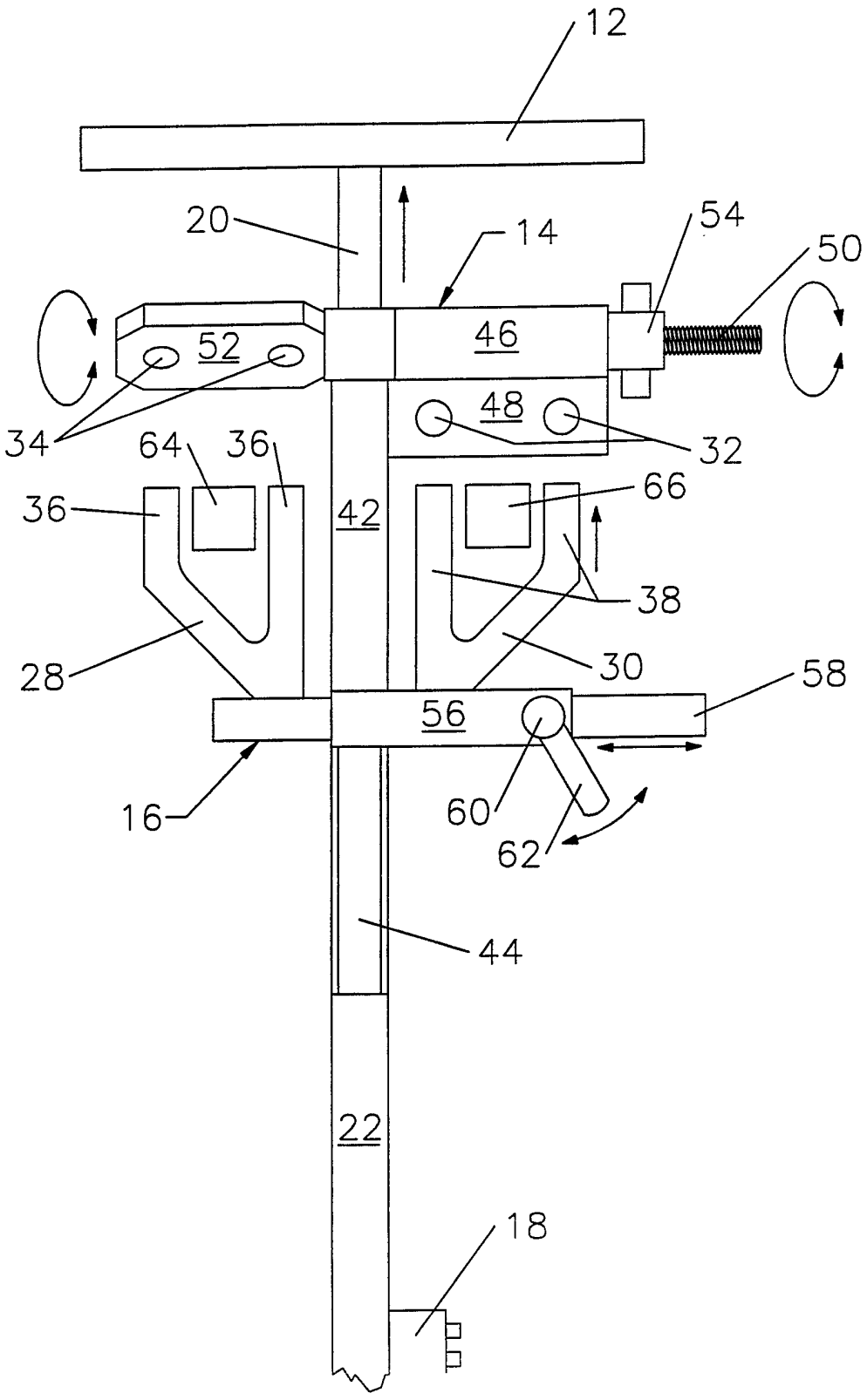
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FIGURE 1.

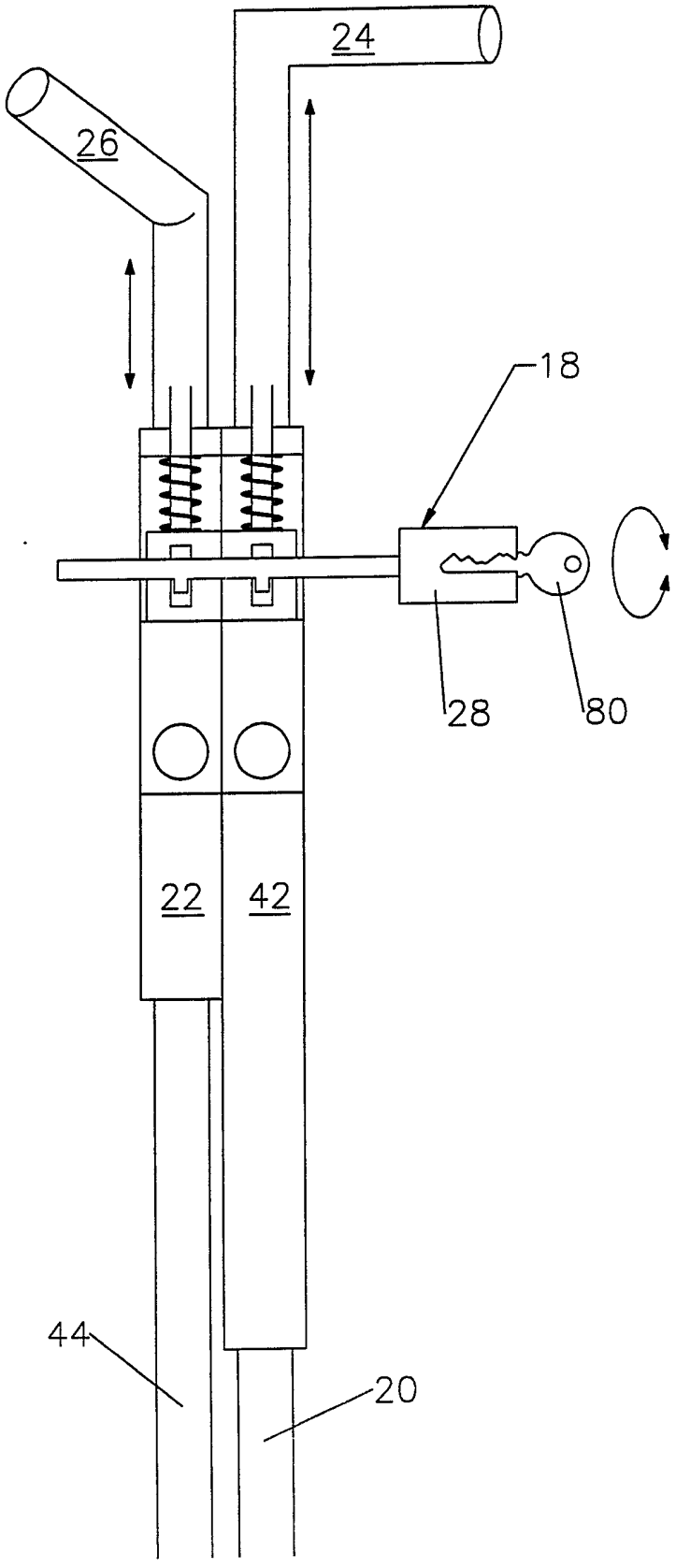

FIGURE 2.

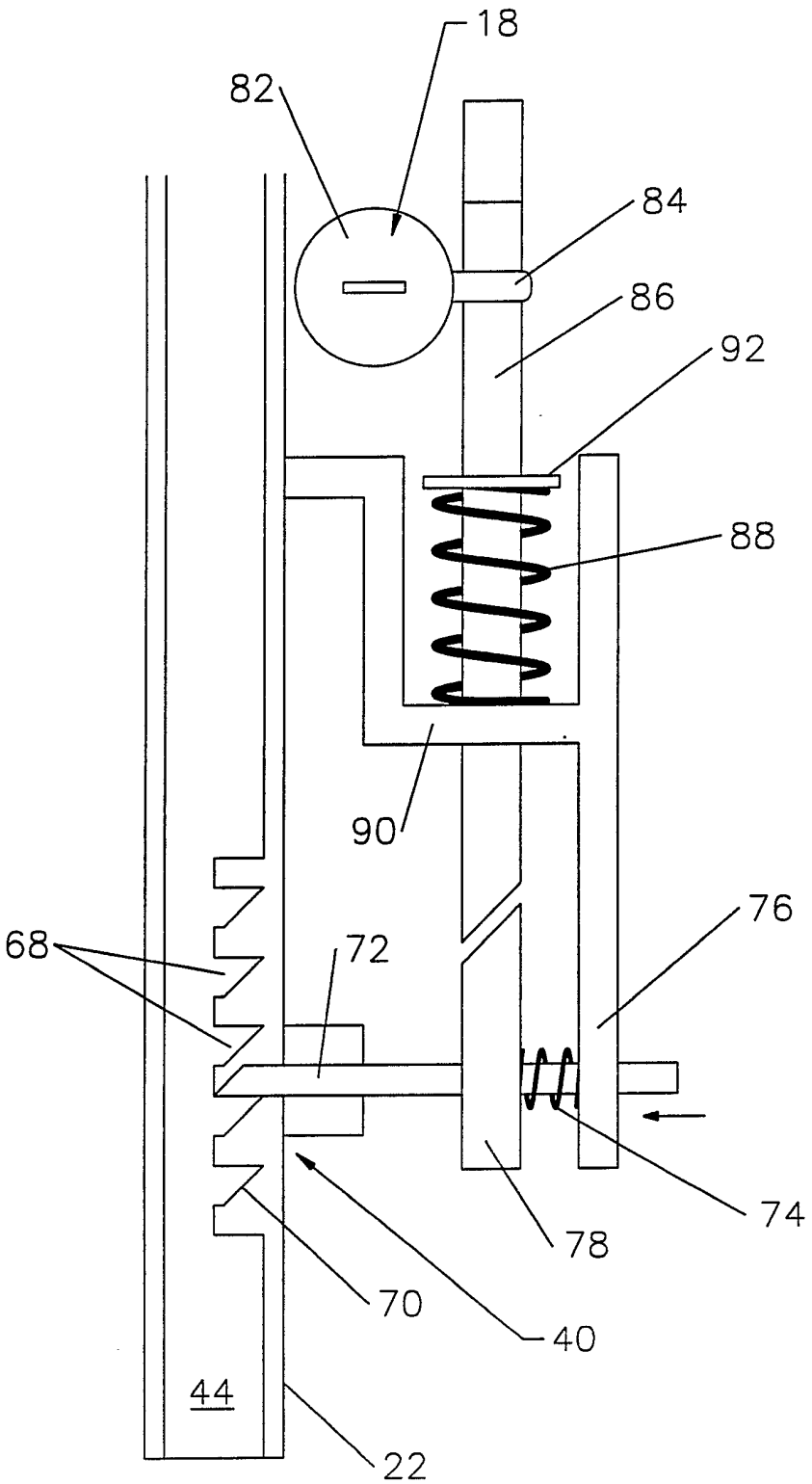

FIGURE 3.

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A VEHICLE IMMOBILISER

This invention relates to vehicle immobilisers of the type which prevent a thief, having broken into a vehicle, from being able to drive it away. In particular, the invention relates to immobilisers which prevent access to or use of one or more control pedals of the vehicle.

Background to the Invention

It is known to immobilise a vehicle by preventing use of one or more of the control pedals. Immobilisers which work in this way are disclosed in Australian patent application number 14006/88 and Australian patent application number 55738/90. The former of these documents discloses an immobiliser consisting of an elongate bar which is attached at one end to the vehicle's steering wheel, a yoke which is located about one or more foot pedals and a lock which locks the elongate bar and the yoke to the foot pedal so as to limit their movement. The yoke includes a foot which bears against the floor or fire wall of the vehicle to restrict further any movement of the foot pedals. The second document discloses an essentially similar immobiliser, but in this case there is no elongate bar attached to the steering wheel. The device consists merely of a base portion which fits between the pedals and the floor or fire wall and a yoke which may be locked to the base portion so as to restrict movement of the foot pedals. When the yoke is unlocked, both portions of the device may be removed from the driver's footwell.

A disadvantage of both these devices is that they must be constructed for individual motor vehicles, since their shape and dimensions must be adapted to fit the particular vehicle in question. In addition, both are clumsy to install, requiring the driver to bend down and position the lower parts of the device beneath the foot pedals.

Summary of the Invention

According to the present invention, there is provided a vehicle immobiliser comprising a foot adapted to abut the firewall or floorpan of the vehicle, a support and a cover independently moveable with respect to the foot along a common axis and together adapted to surround at least one control pedal of the vehicle, and a lock adapted to lock the foot, support and cover relative to one another. The fact that the support and the cover are independently moveable with respect to the foot means that the immobiliser may be used in a variety of vehicles, irrespective of the dimensions of the driver's footwell. In addition, the immobiliser is simple to instal since the foot of the immobiliser may be held in place beneath the pedals by the driver's foot, the support moved up to below the pedals and the cover down such that the support and cover together surround the pedal or pedals, thereby simply and efficiently immobilising the vehicle.

To enable the relative movement of the support and the foot, it is preferred that the foot be integrally attached to a first elongate guide and the support be adapted to slide along the first guide. For ease of operation and installation, it is preferred that the end of the first guide remote from the foot be provided with a first gripping handle.

To enable the relative movement of the cover and the remainder of the immobiliser, it is preferred that the support be integrally attached to a second elongate glide and the cover be adapted to slide along the second guide. Again, it is preferred that the cover be provided with a second gripping handle.

To make the immobiliser yet easier to instal, the support is preferably mounted relative to the foot by means of a first mechanism which is adapted to allow the support to move in one direction away from the foot, but to prevent the support from moving in the opposite direction. Thus,

when the foot and support are initially put in place below the control pedals and then the support is raised, the support will remain in its raised position while the cover is moved into place. Conveniently, the first mechanism may be a first ratchet.

For similar reasons, it is also preferred that the cover be mounted relative to the support by means of a second mechanism which is adapted to allow the cover to move in one direction towards the support, but to prevent the cover from moving in the opposite direction. Thus, once the cover is moved into its operative position in which the cover and the support together surround the control pedal it will remain in place until the second mechanism is released. Where both first and second mechanisms are provided, as is preferred, the cover and the support will both remain in place and therefore the vehicle will be fully immobilised until the lock is released. Again, for convenience, it is preferred that the second mechanism be a second ratchet.

Preferably, the lock is operable to release the ratchet or ratchets.

The cover may include one or more inverted U-shaped clamping elements adapted to straddle one or more control pedals of the vehicle. The support may include a corresponding number of pairs of retaining apertures adapted to receive the legs of the U-shaped clamping elements. So that the immobiliser may be fitted to vehicles with a variety of pedal spacings, it is preferred that the spacing between the clamping elements and the spacing between the pairs of retaining apertures be adjustable.

The present invention also extends to a method of securing a vehicle with an immobiliser comprising a foot, a support and a cover independently moveable with respect to the foot along a common axis, and a lock, the method including

placing the foot in abutment with the firewall or floorpan of the vehicle, moving the support relative to the foot into proximity with the underside of a control pedal or pedals of the vehicle, moving the cover relative to the support such that the support and the cover together surround the control pedal and allow the lock to lock the foot, the support and the cover relative to one another.

Preferably, the support is mounted relative to the foot by means of a first mechanism which is adapted to allow the support to move in one direction away from the foot, but to prevent the support from moving in the opposite direction, the cover is mounted relative to the support by means of a second mechanism which is adapted to allow the cover to move in one direction towards the support, but to prevent the cover from moving in the opposite direction, moving the support relative to the foot is accomplished by raising the cover relative to the foot, thereby raising the support also, and moving the cover relative to the support is accomplished by subsequently depressing the cover. Preferably, the first and second mechanisms are ratchets. Where the foot and the cover are each provided with a gripping handle, installation of the immobiliser is, as will be appreciated, a very simple matter indeed.

Again, the lock is preferably operable to release the ratchet or ratchets and thereby release the immobiliser.

Brief Description of the Drawings

The present invention will now be described by way of example with reference to figures 1 to 3 of the accompanying drawings, in which:

Figure 1 is a top elevation of the immobiliser in use;

Figure 2 is a side elevation; and

Figure 3 is a side elevation of a simple ratchet mechanism.

Detailed Description of the Invention

As can be seen from figure 1 of the drawings, the vehicle immobiliser consists of an elongate box section foot 12, to the middle of which is attached an elongate box section guide 20 perpendicular to the foot 12. The elongate guide 20 passes right through the immobiliser and terminates at its other end in a gripping handle (not shown). A support 14 is mounted on the elongate guide 20 in such a way that it may slide backwards and forwards along the guide 20. A ratchet mechanism (not shown) which will be described in more detail later, permits the support 14 to move away from the foot 12 along the guide 20, but is effective to prevent the support 14 from moving towards the foot 12 until such time as the ratchet mechanism is released.

The support 14 includes an enlarged box section rider 42, which fits around the guide 20. Attached to the lower end of the rider 42 and mounted perpendicularly to the rider is a threaded sleeve 46, to which is attached a support plate 48. The support plate 48 includes a pair of apertures 32, the function of which will be described in more detail below. Threaded within the sleeve 46 is a threaded bar 50, one end of which is a second support plate 52, again provided with a pair of apertures 34. A lock nut 54, on the protruding, threaded part of the bar 50 is provided to lock the threaded bar 50 and hence the second support plate 52 relative to the sleeve 46 and the first support plate 48. The use of the threaded bar 50 and lock nut 54, together with the threaded sleeve 46, allows the distance between the two support plates 48, 52 to be varied in steps of one half of the pitch of the thread.

Towards the upper end of the rider 42, a correspondingly spaced box section guide element 22 is attached. A bar 44, attached to a cover 16 slides within the box section guide 22. A ratchet mechanism (not shown) allows the cover 16 to slide towards the support 14, but prevents the cover 16 from sliding away from the support 14 unless and until the ratchet mechanism is released. The cover 16 consists of a

pair of U-shaped clamping elements 28, 30 one of which is directly attached to a cover sleeve 56, which in turn is connected to the bar 44. The other clamping element 28 is attached to a cover bar 58 which may slide laterally in the cover sleeve 56 and be retained in a desired position by means of a pinch bolt 60. A lever arm 62 is provided on the pinch bolt 60 to facilitate tightening and loosening of the pinch bolt 60. The sleeve 56 and bar 58 arrangement allows the separation between the clamping elements 28, 30 to be adjusted continuously and to be kept in correspondence with the separation between the support plates 48, 52.

Each of the clamping elements 28; 30 includes a pair of legs 36; 38 which are received within apertures 34; 32 in a respective support plate 52; 48 when the cover 16 is moved towards the support 16. The immobiliser is arranged in use such that each clamping element 28; 30 bridges over a respective control pedal 64; 66 and traps it against a respective support plate 52; 48. In this way, a vehicle can be completely immobilised by the device illustrated.

Figure 2 is a side view of the device illustrated in figure 1 and shows the elongate guide 20, the rider 42, the box section guide 22 and the cover bar 44. As can be seen, the elongate guide 20 passes right through the rider 42 and terminates at its free end in a gripping handle 24. Similarly, the cover bar 44 passes right through the box section guide 22 and terminates at its free end in a gripping handle 26. The locking mechanism 18 is illustrated and will be described now in connection with figure 3.

As can be seen from figure 3, the cover bar 44 is provided with a series of ratchet teeth 68, each of which has an inclined upper surface 70. Through an aperture in the box section guide 22 passes a ratchet pawl 72, which is biassed into engagement with the teeth 68 by means of a compression spring 74 acting between a fixed abutment 76 and a collar

78 on the pawl 72. As can be seen from the figure, with the ratchet engaged, the bar 44 may advance to the right, thus moving the cover 16 into proximity with the support 14, but is prevented from moving to the left.

A key 80 may be inserted in the lock barrel 82 and rotated clockwise. A lug 84 projecting from the barrel 82 is correspondingly rotated and bears against a releasing element 86. The releasing element 86 is advanced against the bias of a compression spring 88, acting between a fixed abutment 90 and a collar 92. The terminal end of the releasing element 86 is chamfered and acts against a correspondingly chamfered portion of the collar 78 of the ratchet pawl 72. As the releasing element 86 is advanced the chamfered portions cause the ratchet pawl to be lifted out of engagement with the teeth 68 against the bias of the compression spring 74. When the key is fully rotated in the barrel, the ratchet pawl 72 is completely disengaged from the teeth and the bar 44 may therefore be withdrawn to the left within the guide 22. As will be understood, a similar ratchet mechanism is provided within the rider 42, acting between the rider 42 and the elongate gate guide 20.

Installing the device illustrated in a motor vehicle is a relatively simple matter in view of the existence of the ratchet mechanisms. Firstly the foot 12 is placed against the floorpan or firewall of the vehicle and steadied by means of the gripping handle 24. Before installation, the cover 16 and the support 14 will be at their widest separation and therefore at the initial installation stage the support 14 will be below the control pedals and the cover 16 will be above. Next, the gripping handle 26 is raised, thus raising the cover 16. Owing to the ratchet mechanism acting between the cover 16 and the support 14, the support 14 will also be raised along its own ratchet mechanism until positioned just beneath the control pedals. At this point, the gripping handle 26 may be depressed. The support 14 will be held up in beneath the control

pedals by its ratchet mechanism and therefore depression of the gripping handle 26 will cause the cover 16 to descend and trap the control pedals between the cover 16 and the support 14.

Thus, the device may be installed by a simple two-part motion of raising and then depressing the gripping handle 26. To release the device, the key 80 is inserted in the lock barrel 82 and rotated to disengage the two ratchet mechanisms.

CLAIMS

1. A vehicle immobiliser comprising a foot adapted to abut the firewall or floorpan of the vehicle, a support and a cover independently movable with respect to the foot along a common axis and together adapted to surround at least one control pedal of the vehicle, and a lock adapted to lock the foot, support and cover relative to one another.

2. An immobiliser according to claim 1 in which the foot is integrally attached to a first elongate guide and the support is adapted to slide along the first guide.

3. An immobiliser according to claim 2 in which the end of the guide remote from the foot is provided with a first gripping handle.

4. An immobiliser according to any one of claims 1-3 in which the support is integrally attached to a second elongate guide and the cover is adapted to slide along the second guide.

5. An immobiliser according to claim 4 in which the cover is provided with a second gripping handle.

6. An immobiliser according to any preceding claim in which the support is mounted relative to the foot by means of a first mechanism which is adapted to allow the support to move in one direction away from the foot, but to prevent the support from moving in the opposite direction.

7. An immobiliser according to claim 6 in which the first mechanism is a first ratchet.

8. An immobiliser according to any preceding claim in which the cover is mounted relative to the support by means of a second mechanism which is adapted to allow

the cover to move in one direction towards the support, but to prevent the cover from moving in the opposite direction.

9. An immobiliser according to claim 8 in which the second mechanism is a second ratchet.

10. An immobiliser according to claim 7 or claim 9 in which the lock is operable to release the ratchet or ratchets.

11. An immobiliser according to any preceding claim in which the cover includes an inverted U-shaped clamping element adapted to straddle a control pedal of the vehicle.

12. An immobiliser according to claim 11 including a second inverted U-shaped clamping element adapted to straddle a second control pedal of the vehicle.

13. An immobiliser according to claim 11 in which the support includes a pair of retaining apertures adapted to receive the legs of the U-shaped clamping element.

14. An immobiliser according to claim 12 in which the support includes two pairs of retaining apertures, each adapted to receive the legs of a U-shaped clamping element.

15. An immobiliser according to claim 14 in which the spacing between the clamping elements and the spacing between the pairs of retaining apertures is adjustable.

16. A method of securing a vehicle with an immobiliser comprising a foot, a support and a cover independently movable with respect to the foot along a common axis, and a lock, the method including placing the foot in abutment with the firewall or floorpan of the vehicle,

moving the support relative to the foot into proximity with the underside of a control pedal of the vehicle, moving the cover relative to the support such that the support and the cover together surround the control pedal and allowing the lock to lock the foot, the support and the cover relative to one another.

17. A method according to claim 16 in which the support is mounted relative to the foot by means of a first mechanism which is adapted to allow the support to move in one direction away from the foot, but to prevent the support from moving in the opposite direction, in which the cover is mounted relative to the support by means of a second mechanism which is adapted to allow the cover to move in one direction towards the support, but to prevent the cover from moving in the opposite direction, and in which moving the support relative to the foot is accomplished by raising the cover relative to the foot, thereby raising the support also, and moving the cover relative to the support is accomplished by subsequently depressing the cover.

18. A method according to claim 17 in which the first and second mechanisms are ratchets.

19. A method according to claim 18 in which the lock is operable to release the ratchet or ratchets and thereby release the immobiliser.

Amendments to the claims have been filed as follows

1. A vehicle immobiliser comprising a foot adapted to abut the firewall or floorpan of the vehicle, a support and a cover independently movable with respect to the foot along a common axis and together adapted to surround at least one control pedal of the vehicle, and a lock adapted to lock the foot, support and cover relative to one another wherein the support is mounted relative to the foot by means of a first mechanism which is adapted to allow the support to move in one direction away from the foot, but to prevent the support from moving in the opposite direction.

2. An immobiliser according to claim 1 in which the cover is mounted relative to the support by means of a second mechanism which is adapted to allow the cover to move in one direction towards the support, but to prevent the cover from moving in the opposite direction.

3. An immobiliser according to claims 1 or 2 in which the first mechanism is a first ratchet.

4. An immobiliser according to claim 2 or 3 in which the second mechanism is a second ratchet.

5. An immobiliser according to any preceding claim in which the foot is integrally attached to a first elongate guide and the support is adapted to slide along the first guide.

6. An immobiliser according to claim 5 in which the end of the guide remote from the foot is provided with a first gripping handle.

7. An immobiliser according to any preceding claim in which the support is integrally attached to a second

elongate guide and the cover is adapted to slide along the second guide.

8. An immobiliser according to claim 7 in which the cover is provided with a second gripping handle.

9. An immobiliser according to claim 3 or claim 4 in which the lock is operable to release the ratchet or ratchets.

10. An immobiliser according to any preceding claim in which the cover includes an inverted U-shaped clamping element adapted to straddle a control pedal of the vehicle.

11. An immobiliser according to claim 10 including a second inverted U-shaped clamping element adapted to straddle a second control pedal of the vehicle.

12. An immobiliser according to claim 10 in which the support includes a pair of retaining apertures adapted to receive the legs of the U-shaped clamping element.

13. An immobiliser according to claim 11 in which the support includes two pairs of retaining apertures, each adapted to receive the legs of a U-shaped clamping element.

14. An immobiliser according to claim 13 in which the spacing between the clamping elements and the spacing between the pairs of retaining apertures is adjustable.

15. A method of securing a vehicle with an immobiliser comprising a foot, a support and a cover independently movable with respect to the foot along a common axis, and a lock, the method including placing the foot in abutment with the firewall or floorpan of the vehicle, moving the support relative to the foot into proximity

with the underside of a control pedal of the vehicle, moving the cover relative to the support such that the support and the cover together surround the control pedal and allowing the lock to lock the foot, the support and the cover relative to one another wherein the support is mounted relative to the foot by means of a first mechanism which is adapted to allow the support to move in one direction away from the foot, but to prevent the support from moving in the opposite direction.

16. A method according to claim 15 in which the cover is mounted relative to the support by means of a second mechanism which is adapted to allow the cover to move in one direction towards the support, but to prevent the cover from moving in the opposite direction, and in which moving the support relative to the foot is accomplished by raising the cover relative to the foot, thereby raising the support also, and moving the cover relative to the support is accomplished by subsequently depressing the cover.

17. A method according to claim 17 in which the first and second mechanisms are ratchets.

18. A method according to claim 18 in which the lock is operable to release the ratchet or ratchets and thereby release the immobiliser.

19. A vehicle immobiliser substantially as hereinbefore described and with reference to the drawings.

20. A method of securing a vehicle with an immobiliser substantially as hereinbefore described and with reference to the drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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evant Technical Fields

(i) UK Cl (Ed.N) B7J

(ii) Int Cl (Ed.6) B60R

Search Examiner
R HOWE

Date of completion of Search
16 JANUARY 1995

Databases (see below)
(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

Documents considered relevant following a search in respect of Claims :-
1 TO 19

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	WO 94/19216 A1	(GUSMANO) see Figure 1	1 to 3, 11, 12, 16
X	W 90/05653 A1	(RICCITELLI) see Figure 3	1 to 3, 11, 16
X	US 4076095	(ADAMSKI) see Figure 1	1, 16

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