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PADLOCK

The invention relates to a padlock having a lock body of substantially U-shaped form with spaced-apart branches, a shackle movable back and forth within the lock body between
5 a locked position and a released position and a key-operated lock mechanism within the lock body for locking the shackle to the lock body in its locked position where it is received in both branches of the lock body and has at least one end which extends completely through one of the branches of the
10 lock body to leave a projecting proximal end.

An aim of the invention is to further improve a padlock of the above-mentioned kind and to make it more secure and more versatile in its operation.

The aim of the invention can be achieved with the
15 construction defined in claim 1. In an arrangement according to the invention, supported to said proximal end of the shackle is a lever element which extends transversely with respect to the shackle and is turnable relative to the lock body. With this arrangement the movements of the shackle need
20 no be dependent on the operation of a spring, but can reliably be accomplished manually by making use of the lever element in most conditions of use.

The lock mechanism is advantageously received in a key channel arranged to open on the same side of the lock body
25 that the proximal end of the shackle projects from. In this way the lever element can be so formed and dimensioned, that when the shackle is in its locking position, the lever element can be extended over at least most of the whole of said same side of the lock body so that a part of the lever element
30 covers the key channel of the lock mechanism to dustproof the padlock and form a compact entity.

To facilitate attachment of the lever element with said proximal end of the shackle, the latter can be formed to

comprise a support element, which in the locked position of the shackle extends somewhat beyond the lock body. The lever element is advantageously made with at least some part of plastics material and can be fastened to the said support
5 element of the shackle by means of moulding that part of the lever element around the proximal end.

The design of the lock body can be varied in many ways but desirably a bolt means, for locking the shackle in its locked position to the lock body, is located in a bore formed
10 in that branch of the lock body which is remote from the lever element. Conveniently a further bore is formed in that branch of the lock body closest to the lever element, which further bore contains a spring-loaded blocking means which coacts with a step formed in the shackle in the vicinity of the distal end
15 thereof (i.e. the end remote from the proximal end) to prevent complete removal of the shackle from the lock body. With this arrangement a separate auxiliary piece can be provided for location in the said step to extend at least partly around the shackle, which auxiliary piece is arranged so that when
20 pulling the shackle outwards of the lock body, it presses the said blocking means into a position to release the shackle and allow pulling of the shackle completely away from the lock body.

The lock body can also include a removable cover element,
25 known per se, arranged, in the insertion direction of the key, in front of the lock mechanism, and a stop member, arranged in a blocking position thereof to prevent detachment of the cover element from the lock body. The said stop member can, with advantage, be placed in an extension of said further bore
30 of the lock body containing the blocking means.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 shows a sectional view of a padlock according

to the invention with the shackle in its locked position, and

Figure 2 is a corresponding view showing the padlock of Figure 1 with the shackle in its released position and turned somewhat with respect to the lock body.

5 In the drawings, 1 indicates a U-shaped lock body of the padlock, having branches 1a and 1b with aligned bores 9 and 10 formed in them. The lock body 1 is provided with a shackle 2, which in its locked position (Figure 1) is received in both branches 1a and 1b of the lock body and one end 2b of which 10 (the proximal end) extends through the one branch 1b of the lock body. A lock mechanism 3 is provided in the lock body 1 and includes a key channel 4 for a key 5. The lock mechanism 3 is preferably a cylinder lock.

A force-transmission member 6 is connected to the lock 15 mechanism 3 and acts on bolt means 7, for example a number of steel balls, which, in the locked position of the shackle 2 prevent movement of the shackle 2 into its released or opened position, by engagement of the outermost ball in a step 8 arranged in the distal end 2a of the shackle (e.g. in the form 20 of a circumferential groove). The lock mechanism 3 is turnable with the key 5 into a position, in which a depression 6a in the force-transmission member 6 is located at the position of the bolt means 7 allowing the balls to move away from the shackle 2 sufficiently far to allow the shackle to 25 be pulled into the released position shown in Figure 2.

A further bore 10 contains a blocking means 13, which, urged by a compression spring 14, locates in a step 8 formed by a circumferential groove in the shackle close to the distal end 2a and prevents the shackle 2 being pulled completely out 30 of the lock body 1. However, an auxiliary piece 15 (see Figure 2) is provided (e.g. made of elastic material) which can be placed in said circumferential groove of the shackle 2 to prevent the blocking means 13 from entering the step 8 and thereby make it possible to remove the shackle 2

completely from the lock body 1.

A lever element 11 is fixed to the proximal end 2b of the shackle 2. To facilitate this, the end 2b of the shackle can be formed as shown with a flanged head 12 which is received 5 in a cavity 11a of the lever element. If the lever element 11 is moulded from a plastics material, fastening of the shackle to the lever element can take place by casting the lever element around the flanged head 12. However, clearly other suitable means can be used for fixing the lever element 10 11 to the shackle 2.

The lever element 11 is also provided with a protrusion 11b, which, in the locked position of the shackle 2, can be received in the outer end of the key channel 4 at the same time as the entire lever element 11 extends snugly along the 15 respective side of the lock body 1. When the padlock is to be opened, the lever element 11 is turned sufficiently about the axis of the shackle 2, so that the protrusion 11b is flexed out of the end of the key channel allowing the key 5 to be inserted into the key channel 4. After opening the lock 20 mechanism 3 with the key 5, the shackle 2 can be pulled into the released position as shown in Figure 2 with the aid of the lever element 11. The lever element 11 facilitates handling of the shackle 2. In its rest position, with the padlock locked, the lever element 11 protects the key channel 4 from 25 dust and water ingress and forms, together with the lock body 1, a compact entity.

The lock body 1 is, in a known manner, also provided with an annular cover element 17 protecting the lock mechanism 3 and being advantageously retained in the lock body 1 by means 30 of interengaging screw threads. In this case, naturally, the key channel 4 extends through the cover element 17. Removal of the cover element 17 can be prevented by means of a stop member 16, located in an extension of the further bore 10 and preventing turning of the cover element 17. If, on the other 35 hand, one wishes to remove the cover element 17, for example

for changing the opening combination of the lock mechanism 3, the shackle 2 must first be totally removed from the lock body 1 by making use of the auxiliary piece 15 as described above. Next a plug 10a closing the bore 10 must be temporarily removed to allow the blocking means 13 to be removed from the bore 10. Finally the stop member 16 must be screwed out. The cover element 17 can also be permanently fastened to the lock body 1, for example by means of a locking ring, where there is no requirement for a facility for changing the lock mechanism 3.

The invention is not restricted to the embodiment illustrated, since several modifications thereof are feasible within the scope of the following claims.



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CLAIMS

1. A padlock having a lock body (1) of substantially U-shaped form with spaced-apart branches (1a, 1b), a shackle (2) movable back and forth within the lock body (1) between a
5 locked position and a released position and a key-operated lock mechanism (3) within the lock body (1) for locking the shackle (2) to the lock body (1) in its locked position where it is received in both branches (1a, 1b) of the lock body (1) and has at least one end which extends completely through one
10 of the branches (1b) of the lock body (1) to leave a projecting proximal end (2b), **characterised in that** supported to said proximal end (2b) of the shackle (2) is a lever element (11) which extends transversely with respect to the shackle (2) and is turnable relative to the lock body (1).

15 2. A padlock according to claim 1, **characterised in that** the key channel (4) of the lock mechanism (3) opens to the same side of the lock body (1) that the proximal end (2b) of the shackle projects from and in that the lever element (11) is so formed and dimensioned that when the shackle (2) is in
20 its locked position, the lever element (11) can be placed against the lock body (1).

3. A padlock according to claim 2, **characterised in that** the lever element (11) extends over the whole of said same side of the lock body in question, so that a part of it covers
25 the key channel (4) of the lock mechanism (3).

4. A padlock according to claim 1, 2 or 3, **characterised in that** said proximal end (2b) of the shackle (2) is formed to comprise a support element (12) which in the locked position of the shackle (2) extends somewhat beyond the lock
30 body (1) and to which the lever element (11) is secured.

5. A padlock according to claim 4, **characterised in that** the lever element (11) has at least a part made of plastics material and is fastened to the said support element (12) of



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the shackle (2) by means of moulding the part of the lever element (11) around the proximal end (2b).

6. A padlock according to any one preceding claim, characterised in that a bolt means (7) for locking the shackle 5 (2) in its locked position in the lock body (1) is located in a bore (9) formed in that branch (1a) of the lock body which is remote from the lever element (11).

7. A padlock according to any one preceding claim, characterised in that there is a further bore (10) in that 10 branch (1b) of the lock body closest to the lever element (11), said further bore (10) containing spring-loaded (14) blocking means (13) which coact with a step (8) formed in the shackle (2) in the vicinity of the end (2a) of the shackle remote from the proximal end (2b) to prevent complete removal 15 of the shackle (2) from the lock body (1).

8. A padlock according to claim 7, characterised in that a separate auxiliary piece (15) can be installed to the said step (8), extending at least partly around the shackle and being arranged, when pulling the shackle (2) outwards of the 20 lock body (1), to press the said blocking means (13) into a position to release the shackle (2) and allow removal of the shackle (2) from the lock body (1).

9. A padlock according to claim 7 or 8, characterised in that the lock body (1) includes a removable cover element 25 (17), arranged, in the insertion direction of the key (5), in front of the lock mechanism (3), and a step member (16), arranged in a blocking position thereof, to prevent detachment of the cover element (17) from the lock body (1).

10. A padlock according to claim 9, characterised in 30 that said stop member (16) is placed in an extension of said further bore (10) of the lock body containing the blocking means (13).