

Description

This invention relates to a lock device and has particular reference to a dial lock assembly suitable for locking together a pair of slide fastener sliders or other closure articles for security purposes.

There are known numerous dial or combination locks, a typical example of which is disclosed for instance in Japanese Utility Model Laid-Open Publication No. 57-38449 and comprises a cylindrical casing accommodating therein a latch holder and a latch plate pivotally connected thereto by a latch pin inserted in an elongated guide slot formed in the latch plate, the latch plate having an engaging portion normally urged by a latch spring in a direction to protrude out of the latch holder. Since the latch plate is not unitary with the latch pin and is pivotally supported by the pin within the latch holder, the prior art lock device necessarily involves numerous component parts that would require prolonged length of time for assembling. It has further drawbacks in that the latch pin is prone by sheer oversight to become disengaged from the latch holder, in that the latch mechanism is difficult to be assembled in a limited space in the casing and in that the latch plate is difficult to be designed structurally simple and with sufficient mechanical strength.

Another example of a dial lock is disclosed in JP-U-63 110 211. According to this disclosure, a hook is provided, protruding from the base wall of the slave lock unit, hookable into a hook engagement which is part of a slide incorporated in the master lock unit and said slide integrally includes a pin, provided to mount a dial rotatably thereon. The slide becomes movable by rotating the dial, thereby enabling a release of the hook by moving the slide against the force of a spring urging it into the locking position and consequently enabling the separation of the master lock unit from the slave lock unit.

Inserting a slide into the master lock unit also requires a prolonged length of time for assembling. Moreover, a hook protruding from the ground plate of the slave lock unit may cause some undesired mechanical problems by handling the dial lock assembly.

With the foregoing drawbacks of the prior art in view, the present invention seeks to provide an improved dial lock assembly which can be assembled with utmost ease and which incorporates a latch mechanism of sufficient mechanical strength operatively mounted in place wherein a limited, relatively small space in a lock casing.

According to the present invention, there is provided a dial lock assembly comprising a master lock unit and a slave lock unit releasably engageable therewith, the master lock unit comprising a

casing, a dial rotatably mounted on a support pin, characterized in that the support pin is formed integrally with the base wall of said casing, and a lock tumbler is disposed pivotally and vertically movably within said casing which has a first lock pawl engageable with the base wall of said slave unit and a second lock pawl engageable with said dial, and said tumbler has an axial pin guidedly received in vertical guide grooves in said casing, and said tumbler is normally urged downwardly toward said base wall by resilient means.

The above and other objects and features of the invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings. Like reference numerals refer to like or corresponding parts throughout the several views.

Figure 1 is a side elevational view of a dial lock assembly embodying the invention;

Figure 2 is a partly sectional plan view of the lock assembly of Figure 1;

Figure 3 is a perspective view of a lever lock tumbler forming a part of the lock assembly;

Figure 4 is a longitudinal cross-sectional view of the lock assembly showing the same in locked position;

Figure 5 is a view similar to Figure 4 but showing the lock assembly about to be disassembled;

Figure 6 is a view similar to Figure 5 but showing the lock assembly about to be reassembled; and

Figure 7 is a transverse cross-sectional view taken on the line VII - VII of Figure 2.

Referring now to the drawings and Figures 1 and 2 in particular, there is shown a dial lock assembly generally designated at 10 which comprises a master lock unit 11 and a slave lock unit 12 releasably engaged therewith.

The master lock unit 11 comprises a casing 13 accommodating therein the various operative parts that are better shown in Figures 4, 5 and 6. The casing 13 is formed by a top wall 13a, side walls 13b, 13c, an upright front end wall 13d, an arcuate rear end wall 13e and a base wall 13f. The base wall 13f has an extension 13g extending rearwardly from the casing 13 and having an opening 14 for connecting the master lock unit 11 for example to a slider for slide fastener. A similar opening 15 is formed in the rear end of the slave lock unit 12.

A support pin 13h is formed integrally with and extends vertically centrally of the base wall 13f with its tip end fixedly secured to the top wall 13a of the casing 13 as better shown in Figures 4, 5 and 6.

A dual dial 16 comprises a first dial 17 and a second dial 18 disposed in superposed relation to each other. The first dial 17 is rotatable about the pin 13h relatively to the second dial 18 which is

also rotatably connected to the pin 13h. The first dial 17 is larger in diameter so as to protrude in part beyond the side walls 13b and 13c respectively as better shown in Figure 2. The first dial 17 carries on its upper surface a set of suitable indicia such as numerical figures which are successively exposed to view through a window 19 formed in the top wall 13a of the casing 13 as the dial 17 is rotated.

The dial 17 has an annular groove 20 in its lower surface adapted to receive an engaging lug 21 projecting upwardly from the second dial 18, the lug 21 being engageable in abutting relation to a stopper lug (not shown) disposed in the annular groove 20.

Designated at 22 is a spring interposed between the periphery of the first dial 17 and an upright rim 23 extending integrally from the rear portion of the base wall 13f within the casing 13.

The first and second dial 17 and 18 are respectively provided with notches or recesses 24 and 25 in their respective peripheries which are brought into and out of registry with each other by rotating the first dial 17 relatively to the second dial 18.

The base wall 13f of the casing 13 is provided adjacent its front end with an opening 26 which is registrable with a lock groove 27 formed in the base wall 12a of the slave lock unit 12.

A lock tumbler 28 is disposed within the casing 13 at the front end thereof and adapted to releasably lock the slave lock unit 12 with the master lock unit 11. The tumbler 28 is generally in the form of a disc having a pair of lock pawls 29 and 30 spaced a predetermined distance apart from each other such that the first pawl 29 is fully received in the lock groove 27 while the second pawl 30 abuttingly engages a stepped upper surface 17a of the first dial 17 as shown in Figure 4. As better shown in Figure 3, the lock tumbler 28 has an integral pin 31 axially extending on opposite sides thereof and having both of its ends guidedly received in an elongated guide groove 32 formed vertically in each of the side walls 13b and 13c of the casing 13. The tumbler 28 is normally urged downwardly and clockwise by a torsion coil spring 33 wound on the axial pin 31 on one side of the tumbler 28 and having one arm 33a supported on the top wall 13a of the casing and the other arm 33b supported on a retaining lug 34 projecting from the tumbler 28 above the first lock pawl 29.

As better shown, the slave lock unit 12 is cross-sectionally U-shaped and has a pair of guide grooves 35 of a predetermined length formed horizontally in opposite inner side walls 12b, 12c and adapted to receive corresponding ridges 36 projecting outwardly from the respective side walls 13b and 13c of the casing 13. This ridge and groove

arrangement 35, 36 allows mounting and dismounting of the slave lock unit 12 with respect to the master lock unit 11.

The dial lock assembly 10 is shown in Figure 4 as in truly locked position in which the slave lock unit 12 is united with the master lock unit 11 and more specifically in which the first lock pawl 29 has been received and rested in the lock groove 27 which has been aligned in registry with the opening 26 in the base wall 13f and the second lock pawl 30 has been brought into abutting engagement with the stepped upper surface 17a of the first dial 17.

When separating the slave lock unit 12 from the master lock unit 11, this is done by rotating the first dial 17 in either direction to get a selected memorized digit or digits in the window 19 so as to bring the notch 24 of the first dial 17 into registry with the notch 25, which is what is called "provisional lock" as shown in Figure 5. The slave lock unit 12 is pulled in the direction of "A" or toward the right as viewed in the drawings, when the tumbler 28 is rotated counterclockwise against the tension of the spring 33 with the first pawl 29 retracted away from the base of the slave unit 12 and with the second pawl 30 thrustured through the aligned notches 24, 25 of the respective dials 17, 18 until the respective ridges 36 of the master lock unit 11 are disengaged from the respective guide grooves 35 of the slave lock unit 12.

When mounting or assembling the slave lock unit 12 with the master lock unit 11, this is done by registering the respective guide grooves 35 of the slave unit 12 with the respective ridges 36 of the master unit 11 and thus pushing the slave unit 12 in the direction of "B" or toward the left as viewed in the drawings, in which instance the first lock pawl 29 is lifted in sliding contact with the base wall 12a of the slave unit 12, causing the tumbler 28 to move upwardly along the vertical guide grooves 32 in the casing 13. This master and slave coupling can be effected regardless of whether the lock tumbler 28 is held in "true lock position" as shown in Figure 4 or in "provisional lock position" as shown in Figure 5, the two respective lock positions being selectively obtained by handling the dial 17.

The dial lock assembly 10 according to the invention may be applied, though not limited, to a pair of sliders for slide fasteners by connecting the master lock unit 11 to one such slider and the slave lock unit 12 to the other slider.

Many changes and modifications may be made in the specific form and construction herein advanced without departing from the scope of the appended claims. As for an example, the ridges 36 may be formed on the slave unit 12, while the grooves 35 engageable with the ridges 36 may be accordingly formed in the master unit 11. As for

another example, it is possible to operatively associate the lock assembly 10 with a key-operated device in place of the dial arrangement herein advanced.

Claims

1. A dial lock assembly (10) comprising a master lock unit (11) and a slave lock unit (12) releasably engageable therewith, said master lock unit (11) comprising a casing (13), a dial (16) rotatably mounted on a support pin (13h), characterized in that
the support pin (13h) is formed integrally with the base wall (13f) of said casing (13), and
a lock tumbler (28) is disposed pivotally and vertically movably within said casing which has a first lock pawl (29) engageable with the base wall (12a) of said slave unit (12) and a second lock pawl (30) engageable with said dial (16), and said tumbler (28) has an axial pin (31) guidedly received in vertical guide grooves (32) in said casing (13), and said tumbler (28) is normally urged downwardly toward said base wall (12a) by resilient means (33).
2. A dial lock assembly (10) according to claim 1 wherein said master unit (11) has a ridge (36) engageable in a horizontal guide groove (35) in said slave unit (12).
3. A dial lock assembly (10) according to claim 1 wherein said dial (16) comprises a first dial (17) and a second dial (18) disposed in superposed relation thereto, said first dial (17) being rotatable about said support pin (13h) relatively to said second dial (18).
4. A dial lock assembly (10) according to claim 3 wherein said first and second dials (17) and (18) are provided peripherally with notches (24) and (25), respectively which are registrable by rotation of said first dial (17).
5. A dial lock assembly (10) according to claim 1 wherein said slave unit (12) has in its base wall (12a) a lock groove (27) engageable with said first lock pawl (29).
6. A dial lock assembly (10) according to claim 1 wherein said dial (16) protrudes beyond opposite sides of said casing (13).
7. A dial lock assembly (10) according to claim 1 wherein said casing (13) has a window (19) through which a surface portion of said dial (16) is exposed to view.

8. A dial lock assembly (10) according to claim 1 wherein said resilient means (33) is a torsion coil spring.

Patentansprüche

1. Wählscheibenschließanordnung (10) mit einer Hauptschließeinheit (11) und einer damit lösbar in Eingriff bringbaren Nebenschließeinheit (12), wobei die Hauptschließeinheit (11) aufweist ein Gehäuse (13), eine drehbar auf einem Trägerstift (13h) angeordnete Wählscheibe (16), dadurch gekennzeichnet, daß
der Trägerstift (13h) einstückig mit der Bodenwand (13f) des Gehäuses (13) gebildet ist, und
eine Schließraste (28) schwenkbar und vertikal bewegbar in dem Gehäuse angeordnet ist, die eine erste mit der Bodenwand (12a) der Nebeneinheit (12) in Eingriff bringbare Schließklinge (29) und eine zweite mit der Wählscheibe (16) in Eingriff bringbare Schließklinge (30) aufweist, und bei der die Klinge (28) einen in vertikalen Führungsnuten (32) in dem Gehäuse (13) führungsmäßig aufgenommenen axialen Stift (31) aufweist, und bei der die Raste (28) mittels einer elastischen Einrichtung (33) in Richtung auf die Bodenwand (12a) senkrecht nach unten gezwungen wird.
2. Wählscheibenschließanordnung (10) nach Anspruch 1, bei der die Haupteinheit (11) eine in eine horizontale Führungsnut (35) in der Nebeneinheit (12) in Eingriff bringbare Leiste (36) aufweist.
3. Wählscheibenschließanordnung (10) nach Anspruch 1, bei der die Wählscheibe (16) umfaßt eine erste Wählscheibe (17) und ein in darüberliegender Beziehung dazu angeordnete zweite Wählscheibe (18), wobei die erste Wählscheibe (17) bezüglich der zweiten Wählscheibe (18) um den Trägerstift (13h) drehbar ist.
4. Wählscheibenschließanordnung (10) nach Anspruch 3, bei der die ersten und zweiten Wählscheiben (17) und (18) jeweils an ihrem Umfang mit Kerben (24) und (25) versehen sind, die durch Drehung der ersten Wählscheibe (17) zueinander ausgerichtet werden können.
5. Wählscheibenschließanordnung (10) nach Anspruch 1, bei der die Nebeneinheit (12) in ihrer Bodenwand (12a) eine mit der ersten Schließklinge (29) in Eingriff bringbare Schließnut (27) aufweist.



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Claims

1. A dial lock assembly (10) comprising a master lock unit (11) and a slave lock unit (12) releasably engageable therewith, said master lock unit (11) comprising a casing (13), a dial (16) rotatably mounted on a support pin (13h), characterized in that
 - the support pin (13h) is formed integrally with the base wall (13f) of said casing (13), and
 - a lock tumbler (28) is disposed pivotally and vertically movably within said casing which has a first lock pawl (29) engageable with the base wall (12a) of said slave unit (12) and a second lock pawl (30) engageable with said dial (16), and said tumbler (28) has an axial pin (31) guidedly received in vertical guide grooves (32) in said casing (13), and said tumbler (28) is normally urged downwardly toward said base wall (12a) by resilient means (33).
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4. A dial lock assembly (10) according to claim 3 wherein said first and second dials (17) and (18) are provided peripherally with notches (24) and (25), respectively which are registrable by rotation of said first dial (17).
5. A dial lock assembly (10) according to claim 1 wherein said slave unit (12) has in its base wall (12a) a lock groove (27) engageable with said first lock pawl (29).
6. A dial lock assembly (10) according to claim 1 wherein said dial (16) protrudes beyond opposite sides of said casing (13).
7. A dial lock assembly (10) according to claim 1 wherein said casing (13) has a window (19) through which a surface portion of said dial (16) is exposed to view.
8. A dial lock assembly (10) according to claim 1 wherein said resilient means (33) is a torsion coil spring.

5 Patentansprüche

1. Wählscheibenschließanordnung (10) mit einer Hauptschließeinheit (11) und einer damit lösbar in Eingriff bringbaren Nebenschließeinheit (12), wobei die Hauptschließeinheit (11) aufweist ein Gehäuse (13), eine drehbar auf einem Trägerstift (13h) angeordnete Wählscheibe (16), dadurch gekennzeichnet, daß
 - der Trägerstift (13h) einstückig mit der Bodenwand (13f) des Gehäuses (13) gebildet ist, und
 - eine Schließraste (28) schwenkbar und vertikal bewegbar in dem Gehäuse angeordnet ist, die eine erste mit der Bodenwand (12a) der Nebeneinheit (12) in Eingriff bringbare Schließklinge (29) und eine zweite mit der Wählscheibe (16) in Eingriff bringbare Schließklinge (30) aufweist, und bei der die Klinge (28) einen in vertikalen Führungsnuten (32) in dem Gehäuse (13) führungsmäßig aufgenommenen axialen Stift (31) aufweist, und bei der die Raste (28) mittels einer elastischen Einrichtung (33) in Richtung auf die Bodenwand (12a) senkrecht nach unten gezwungen wird.
2. Wählscheibenschließanordnung (10) nach Anspruch 1, bei der die Haupteinheit (11) eine in eine horizontale Führungsnut (35) in der Nebeneinheit (12) in Eingriff bringbare Leiste (36) aufweist.
3. Wählscheibenschließanordnung (10) nach Anspruch 1, bei der die Wählscheibe (16) umfaßt eine erste Wählscheibe (17) und eine in dar-überliegender Beziehung dazu angeordnete zweite Wählscheibe (18), wobei die erste Wählscheibe (17) bezüglich der zweiten Wählscheibe (18) um den Trägerstift (13h) drehbar ist.
4. Wählscheibenschließanordnung (10) nach Anspruch 3, bei der die ersten und zweiten Wählscheiben (17) und (18) jeweils an ihrem Umfang mit Kerben (24) und (25) versehen sind, die durch Drehung der ersten Wählscheibe (17) zueinander ausgerichtet werden können.
5. Wählscheibenschließanordnung (10) nach Anspruch 1, bei der die Nebeneinheit (12) in ihrer Bodenwand (12a) eine mit der ersten Schließklinge (29) in Eingriff bringbare Schließnut (27) aufweist.



6. Wählscheibenschließanordnung (10) nach Anspruch 1, bei der die Wählscheibe (16) über gegenüberliegende Seiten des Gehäuses (13) vorspringt.

7. Wählscheibenschließanordnung (10) nach Anspruch 1, bei dem das Gehäuse (13) ein Fenster (19) aufweist, durch das ein Oberflächenbereich der Wählscheibe (16) der Sicht ausgesetzt ist.

8. Wählscheibenschließanordnung (10) nach Anspruch 1, bei der die elastische Einrichtung (33) eine Torsionsspulenfeder ist.

Revendications

1. Système (10) de serrure à combinaisons comprenant un ensemble (11) de serrure maître et un ensemble (12) de serrure asservie pour venir en prise de façon libérable avec cet ensemble de serrure maître, ledit ensemble (11) de serrure maître comprenant un boîtier (13), un cadran (16) monté de façon tournante sur un axe de support (13h), caractérisé en ce que :

l'axe support (13h) fait corps avec la paroi de base (13f) du boîtier (13), et

une gâchette (28) est disposée de façon pivotante et verticale à l'intérieur du boîtier et comporte un premier doigt de verrouillage (29) pouvant venir en prise avec la paroi de base (12a) de l'ensemble asservi (12) et un second doigt de verrouillage (30) pour venir en prise avec le cadran (16), et ladite gâchette (28) comporte un axe (31) reçu de façon guidée dans des rainures de guidage verticales (32) du boîtier (13), et ladite gâchette (28) est poussée normalement vers le bas en direction de la paroi de base (12a) par un moyen élastique (33).

2. Système (10) de serrure à combinaisons selon la revendication 1, dans lequel l'ensemble maître (11) comporte une nervure (36) pouvant être placée dans une rainure de guidage horizontale (35) de l'ensemble asservi (12).

3. Système (10) de serrure à combinaisons selon la revendication 1, dans lequel le cadran (16) comprend un premier cadran (17) et un second cadran (18) disposé d'une façon superposée, le premier cadran (17) pouvant tourner autour de l'axe support (13h) par rapport au second cadran (18).

4. Système (10) de serrure à combinaisons selon la revendication 3, dans lequel les premiers et

seconds cadrans (17) et (18) sont pourvus à leur périphérie d'encoches (24) et (25) respectivement et que l'on peut faire venir en face l'une de l'autre en faisant tourner le premier cadran (17).

5. Système (10) de serrure à combinaisons selon la revendication 1, dans lequel l'ensemble asservi (12) comporte dans sa paroi de base (12a) une rainure de verrouillage (27) dans laquelle peut venir en prise le premier doigt de verrouillage (29).

6. Système (10) de serrure à combinaisons selon la revendication (1), dans lequel le cadran (16) fait saillie au-delà des côtés opposés du boîtier (13).

7. Système (10) de serrure à combinaisons selon la revendication 1, dans lequel le boîtier (13) comporte une fenêtre (19) à travers laquelle une partie de la surface du cadran (16) est visible.

8. Système (10) de serrure à combinaisons selon la revendication 1, dans lequel le moyen élastique (33) est un ressort hélicoïdal travaillant à la torsion.

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