

(19) **DANMARK**

(10) **DK/EP 3617431 T3**



Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

-
- (51) Int.Cl.: **E 05 B 71/00 (2006.01)** **B 62 H 5/14 (2006.01)** **E 05 B 47/00 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2022-01-10**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2021-12-08**
- (86) Europæisk ansøgning nr.: **19191832.5**
- (86) Europæisk indleveringsdag: **2019-08-14**
- (87) Den europæiske ansøgnings publiceringsdag: **2020-03-04**
- (30) Prioritet: **2018-08-30 DE 102018121248**
- (84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**
- (73) Patenthaver: **ABUS August Bremicker Söhne KG, Altenhofer Weg 25, 58300 Wetter-Volmarstein, Tyskland**
- (74) Fuldmægtig i Danmark: **NORDIC PATENT SERVICE A/S, Bredgade 30, 1260 København K, Danmark**
- (54) Benævnelse: **LÅS**
- (56) Fremdragne publikationer:
CN-A- 107 120 002
CN-A- 107 687 297
CN-U- 205 591 695
CN-Y- 2 861 417
CN-Y- 201 100 043
DE-A1-102016 125 320
KR-B1- 101 110 416

The present lock relates to a lock, in particular for a two-wheeler, comprising a lock body; a hoop which is movable, in particular supported or at least guided, between an open position and a closed position; and a latch which is movably supported at the lock body between a locked position in which it blocks the hoop, while the hoop is in its closed position, against a departure from the closed position, and an unlocked position in which it releases the hoop. The lock can in particular be a frame lock. In its closed position, the hoop, for example, serves to secure an object by means of the lock, e.g. to connect it to another object or to block a movement of the object, for instance in the manner of a spoke lock which prevents the rotation of a wheel. The latch, in contrast, typically does not cooperate with objects outside the lock, but rather with the hoop and serves to block or release the hoop, in particular in its closed position, depending on whether the lock is locked or unlocked.

Such a lock can be configured as semi-automatic or fully automatic to improve comfort in that it is at least partly drivable by a motor. This means that individual elements of the lock can be moved in a motorized manner by one or more drive motors of the lock. As a rule, such a lock can at least be unlocked in a motorized manner, i.e. the latch is displaceable in a motorized manner from the locked position into the unlocked position to release the hoop for a departure from its closed position. The latch can, however, additionally or alternatively, also be displaceable in a motorized manner in the opposite direction. Provision can additionally be made that the hoop can (also) be moved in a motorized manner. A lock having these features is, for example, known from CN 201 100 043 Y.

To be able to reliably move an element of the lock which is drivable in a motorized manner, it is expedient to be able to detect information on the respective current position of the element. A sensor can, for example, be provided for this purpose. Such a sensor is in particular used to detect the latch position. If the latch can only adopt certain positions such as the locked position when the hoop is in a specific position, e.g. in the closed position, the position of the hoop can also be indirectly detectable by means of the sensor detecting the latch position.

To be able to determine with reference to the sensor whether the hoop is locked or released, the sensor must be able to reliably distinguish between the locked position and the unlocked position of the latch. In the endeavor to configure the lock in as compact a manner as possible, however, the stroke of the latch, i.e. the length of the distance, as a rule of the linear distance,

to be covered between the locked position and the unlocked position can be very small so that the locked position and the unlocked position cannot be distinguished or cannot be reliably distinguished from one another.

- 5 The latch must furthermore be able to cooperate with the hoop to block the hoop. The latch is therefore as a rule arranged in direct proximity to the hoop, with dirt also being able to penetrate from the outside into the region of the latch from the hoop which cooperates with objects outside the lock. Such contaminants can additionally disrupt the detection of the latch position and thus make it more difficult.

10 It is an object of the invention to provide a lock which is in particular at least partly drivable in a motorized manner and in which the positions of moving elements of the lock, in particular the respective position of the latch and advantageously also, at least indirectly, the position of the hoop can be detected particularly reliably.

15 The object is satisfied by a lock having the features of claim 1. Advantageous embodiments of the invention result from the dependent claims, from the Figures and from the present description.

- 20 In accordance with the invention, the lock comprises a movably supported lever, wherein a coupling section of the lever is movement-coupled to the latch, wherein the lever is supported such that, on a movement of the coupling section, a deflection section of the lever spaced apart from the coupling section carries out a movement which is larger than the movement of the coupling section, and wherein the sensor detects the position of the deflection section of the
25 lever to detect the latch position.

The lever therefore, on the one hand, has a coupling section and, on the other hand, a deflection section which are arranged separately from one another. The lever is here movement-coupled to the latch via the coupling section, that is it is in particular coupled such that a movement of
30 the latch results in a corresponding movement of the coupling section and/or vice versa. The movements can here in particular be in accordance with one another to the extent that the latch and the coupling section of the lever at least substantially move by the same amount. The latch

and the coupling section of the lever can, however, here also be coupled such that a linear movement of the latch results in a rotational movement or pivot movement of the lever and/or vice versa. The coupling section thus does not necessarily have to carry out exactly the same movement as the latch. However, there is preferably at least an unambiguous relationship
5 between the respective position of the latch and the respective position of the coupling section due to the movement coupling. The coupling section of the lever and the latch furthermore preferably cooperate directly with one another, e.g. by a direct engagement into one another.

The deflection section of the lever is formed by that section of the lever whose position is
10 detected by the sensor, in particular directly. The sensor preferably cooperates directly with the deflection section of the lever for this purpose. The position of the latch is in contrast only indirectly detected in this manner.

On a movement of the lever which is preferably configured at least substantially as rigid, not
15 only the coupling section, but also the deflection section of the lever move due to the kind of support of the lever. The amount of the movement of the deflection section is here, however, not identical with the amount of the movement of the coupling section. A kind of translation rather takes place which results from the arrangement of the coupling section and of the deflection section relative to one another in connection with the kind of support of the lever.
20 The movement of the deflection section which it carries out when the coupling section moves is here larger than the simultaneous movement of the coupling section. To this extent, the movement of the latch by the lever is therefore not only transmitted from the coupling section to the deflection section, but is also amplified in this process.

25 Both the transmission of the movement and the amplification here contribute to an improvement of the reliability of the detection of the latch position. For, on the one hand, the detection can thus take place in a region which can be outside the so-called contamination region of the latch and can thus be better protected against contamination. The sensor can in particular thereby be positioned more flexibly within the lock, for example together with other
30 sensitive electronic components in a particularly protected region of the lock. On the other hand, the different positions of the latch can be distinguished more reliably as a result of the amplification. While the total stroke of the latch can amount to a few millimeters, preferably

less than 5 mm, e.g. approximately 4 mm or less, provision can be made that the corresponding stroke of the deflection section amounts to at least one and a half times, preferably at least double, that of the latch stroke. Since there is ideally an unambiguous relationship between the position of the latch and the position of the deflection section (apart from a clearance which is as small as possible) via the lever and the movement coupling of the lever to the latch, the positions of the deflection section that correspond to the unlocked position or to the locked position of the latch are further apart than said latch positions due to the increased movement. The cooperation of the sensor with the deflection section can therefore differ more in these two positions and can thus result in a more reliable detection than if the sensor were to cooperate directly with the latch.

The lever can, for example, be pivotably supported about a pivot point. The amplification between the coupling section and the deflection section then results directly from the ratio of the respective spacings of the two sections from the pivot point. In addition, the amplification is constant with such a pivotable support. In general, however, other kinds of support can also be considered, also including those in which the amplification varies. Deviations from an exactly constant amplification can also result from the kind of movement coupling of the coupling section of the lever to the latch, e.g. when the movement of the latch is linear while the coupling section of a pivotable lever runs through a partial circle path.

The pivot point can in particular be provided between the coupling section and the deflection section. This enables a comparatively simple support of the lever and a coupling of the latch to the lever. In general, the coupling section and the deflection section can, however, also be arranged at the same side of the pivot point. In this manner, comparatively large amplifications of the respective amount of the movement between the coupling section and the deflection section can be achieved with a comparatively short lever, which makes particularly compact embodiments possible.

The lever can, for example, be at least substantially bar-shaped. The coupling section, the deflection section, and the pivot point can in particular in this case be on a straight line which can correspond to the longitudinal extent of the lever. The coupling section can furthermore be provided at a first end of the lever and the deflection section can be provided at a second end of

the lever opposite the first end. The ends of the lever are in particular ends with respect to said longitudinal extent of the lever.

- 5 In accordance with an advantageous embodiment, the hoop is at least partly arranged within the lock body, with the latch and the lever being arranged completely within the lock body. For while the hoop has to cooperate with objects outside the lock, it is in particular advantageous with respect to the security of the lock if the latch and the lever are not accessible from the outside. The lever here makes possible a flexible positioning of the sensor which is likewise advantageously arranged in the lock, and is not accessible from the outside, and is not
- 10 restricted to an arrangement in the proximity of the latch due to the lever. Due to this arrangement of the lever and/or of the sensor, the position detection can take place outside the contamination region of the latch and in particular also in an encapsulated region of the lock body, or a region of the lock body particularly secured in a different manner.
- 15 It is furthermore preferred that the deflection section magnetically cooperates with the sensor. In this manner, the detection of the position of the deflection section by means of the sensor can advantageously take place contactlessly. This makes it possible to arrange the sensor, and equally further electronics of the lock, spatially isolated with respect to mechanical elements such as in particular the lever and the latch.
- 20 The sensor can, for example, be configured as a magnetic sensor that cooperates with a permanent magnet which the deflection section has. The deflection section can in particular be at least substantially defined by the permanent magnet. The sensor can generally, for example, be configured as a simple magnetic switch. The sensor is, however, preferably configured as a
- 25 Hall sensor or as a magnetic field sensor. It is particularly advantageous here if the sensor is configured for a three-dimensional magnetic detection. This means, for example, that it is possible to determine the position of a permanent magnet in space by means of the sensor or that not only the strength of a magnetic field, but also its spatial orientation can be determined by means of the sensor. In this manner, more than two states can also be distinguished by
- 30 means of a single sensor and whole movement paths can be reproduced under certain circumstances.

The magnetic cooperation of the deflection section with the sensor further makes an embodiment possible in which the lock comprises an inner housing, preferably an inner housing closed fully around its periphery, which is arranged within the lock body, with the sensor being arranged within the inner housing and the lever being arranged outside the inner housing. The deflection section and the sensor here therefore magnetically cooperate through the inner housing. In this manner, the sensor can optionally be encapsulated with other electronics and/or other components of the lock to be especially protected by the inner housing with respect to the other components of the lock. The inner housing is here advantageously not magnetic and is preferably configured as reinforced with respect to an outer housing the lock, e.g. is formed from a hardened material, in particular from a hardened metal.

In accordance with a further advantageous embodiment, the lever is supported such that it has a single degree of freedom. This is in particular expedient when the latch also only has one degree of freedom. If only one degree of freedom is present, the lever can only be moved along a defined movement path; however, in two opposite directions. Measured values detected by the sensor can in particular be distinguished by a movability restricted in this manner especially with respect to whether they can be associated with a possible position of the deflection section, i.e. in particular with a position along the defined movement path of the deflection section. If an association is not possible, the detected measured value may

have to be evaluated as an indication of a manipulation attempt at the lock in which the lever is moved away from its usual movement path or in which an attempt is made to influence the lock by means of external magnetic fields. In connection with such a detection of manipulation attempts, said sensors configured for a three-dimensional magnetic detection are in particular advantageous since they provide more differentiated information than magnetic sensors which only detect the spacing of a magnet from the sensor or only the absolute amount of the strength of a magnetic field.

In accordance with a further advantageous embodiment, the lock comprises a drive motor for moving the latch. The drive motor can additionally also be provided to move the hoop. The lock can also have one or more further drive motors, in addition to said drive motor, to move the hoop and/or further movable elements of the lock.

If a drive motor for moving the latch is provided in the lock, the lever is preferably aligned substantially in parallel with the drive motor. A longitudinal extent of the lever, e.g. a connection line between the coupling section and the deflection section of the lever, is here in particular arranged in parallel with an axis of rotation of a drive shaft of the drive motor and/or with a longitudinal extent of the drive motor. The lever can in particular adopt at least one position as part of its movability that corresponds to a position of the latch on its movement path between the locked position and the unlocked position and in which the lever is aligned in parallel with the drive motor.

The coupling section of the lever is here preferably arranged in the region of a drive shaft of the drive motor and the deflection section of the lever is arranged in the region of electrical connections of the drive motor. For in this manner, the output shaft of the drive motor or a transmission element connecting the output shaft to the latch in a drive-effective manner and the coupling section of the lever can cooperate with the latch, on the one hand, and the connections of the drive motor and the deflection section of the lever can cooperate with the sensor or with other electronic components, e.g. with an evaluation and control unit which is also connected to the sensor, on the other hand, without any greater spatial distances having to be overcome.

In accordance with a further advantageous embodiment, the hoop has a first engagement recess into which the latch can engage when the hoop is in the closed position to block the hoop against a departure from the closed position. The hoop furthermore preferably has a second engagement recess into which the latch can engage when the hoop is in the open position to block the hoop against a departure from the open position. In such an embodiment, the open position can therefore also be secured by the hoop in addition to the closed position. This is, for example, advantageous with automatic frame locks in which it is important to ensure that the hoop does not close accidentally, above all not during a ride. The position the latch adopts when it completely engages into the first engagement recess of the hoop in particular corresponds to said locked position. The position the latch adopts when it completely engages into the second engagement recess of the hoop could generally likewise correspond to said locked position. Within the framework of the invention, it is, however, preferably a securing

position of the latch which differs both from the locked position and from the unlocked position of the latch, as will be explained in the following.

5 In accordance with the invention, the latch is preloaded against the hoop so that it contacts a contour of the hoop at least for as long as it is not moved or held against the preload, e.g. by a drive motor of the lock. On a movement of the hoop, the latch can here slide along the contour, at least along regions of the contour that do not have any step-like jumps. The contour of the hoop is configured here such that, as a consequence of the preload, the latch adopts its locked position in the closed position of the hoop, adopts its unlocked position in positions of the hoop
10 that are between the closed position and the open position of the hoop, and adopts a securing position differing from the locked position and the unlocked position in the open position of the hoop. The securing position is preferably disposed along the movability of the latch between its locked position and its unlocked position.

15 Provision can furthermore be made in such an embodiment that the contour of the hoop has said first engagement recess and said second engagement recess so that, as a consequence of the preload, the latch engages into the first engagement recess in the closed position of the hoop, with the locked position of the latch being defined by the depth of the engagement, and engages into the second engagement recess in the open position of the hoop, with the securing
20 position of the latch being defined by the depth of the engagement.

The movement of the deflection section of the lever cooperating with the sensor amplified with respect to the movement of the latch is in particular advantageous due to the securing position of the latch which is defined in addition to the locked position and the unlocked position of the
25 latch and by which at least three different positions are to be distinguished. For the more latch positions that have to be distinguished, the more difficult their differentiation is, in particular with a latch having a small overall stroke. Since the latch position is not directly detected, but rather with reference to the position of the deflection section of the lever movement-coupled to the latch, more than two positions of the latch can, however, also be reliably distinguished.

30 Locks configured in accordance with the invention, in which the latch is preloaded against a contour of the hoop, additionally make it possible to also determine the position of the hoop

with reference to the detected latch position (over the deflection section of the lever). For due to the preload, as long as the latch is not moved or held against the preload, the position of the latch is determined by the position of the contour of the hoop the latch just contacts, which in turn depends on the position of the hoop. The contour can here in particular have at least three
5 different levels which thus result in a corresponding number of latch positions and are arranged such that the latch contacts the contour in the closed position of the hoop at the height of a first level that can in particular correspond to said first engagement recess and thereby adopts its locked position; contacts the contour in the open position of the hoop at the height of a second level that can in particular correspond to said second engagement recess and thereby adopts its
10 securing position; and contacts the contour at the height of a third level in positions of the hoop between the closed position and the open position. The position of the latch corresponding to this third level can then be evaluated as an indication that the hoop is just somewhere between the closed position and the open position and is in particular just moving, particularly since the latch advantageously does not block the hoop in this position. To this extent, this latch position
15 corresponds to the unlocked position of the latch. The unlocked position of the latch here does not necessarily have to be fixed to a single latch position, but can rather also comprise a range of latch positions, namely in particular all those positions in which the hoop is released for a movement out of the closed position into the open position and/or vice versa. An (or each) position in which the latch is adjusted in a motorized manner against the preload by so much
20 that it is displaced beyond the uppermost level of the contour of the hoop and thus necessarily releases the hoop can to this extent in particular also correspond to the unlocked position of the latch.

The invention will be described in the following by way of example with reference to the
25 Figures.

Fig. 1 shows in a perspective schematic representation parts of an embodiment of the lock in accordance with the invention, with the hoop being in the closed position and the latch being in the locked position;

30 Fig. 2 shows the same embodiment with the same positions as in Fig. 1, but from a different angle of view;

Fig. 3 largely corresponds to Fig. 2, but with the hoop adopting an intermediate position and the latch being in the unlocked position;

5 Fig. 4 largely corresponds to Fig. 2, but with the hoop being in the open position and the latch being in a securing position; and

Fig. 5 shows the same embodiment as in Figs. 1 to 4 in a perspective schematic detail representation, with in part different parts of the lock being shown than in Figs.
10 1 to 4.

Figs. 1 to 5 show an embodiment of a lock in accordance with the invention. It is a partly automatic frame lock 11 which is in particular intended for two-wheelers in this embodiment. The frame lock 11 comprises a lock body 13 of which only a plate 15 bounding an inner space
15 of the lock body 13 is shown in Figs. 1 to 4; in Fig. 5, however, details of further elements are shown.

The frame lock 11 further comprises a hoop 17 which is the shape of a partial arc and which is respectively only partly shown and which is movable between the closed position shown in
20 Figs. 1 and 2 and the open position shown in Figs. 4 and 5. In the state of the lock shown in Fig. 3, the hoop 17 is in an intermediate position between the closed position and the open position. The hoop 17 is guided by the lock body 13 on a circular path along which the shape of a partial arc of the hoop 17 also extends. The frame lock 11 is configured to be arranged at a
25 wheel of a two-wheeler such that the hoop 17 engages between the spokes of the wheel in the closed position and thereby blocks it; in contrast it releases the wheel in the open position. The hoop 17 can here be preloaded into the open position.

The general movability of the hoop 17 is restricted by a latch 19 of the lock 11 which is substantially movably supported radially with respect to the shape of a partial arc of the hoop
30 17 at the lock body 13. The latch 19, when the hoop 17 is in its closed position, can here engage into a first engagement recess 21 of the hoop 17 which extends radially from the outside into the hoop 17. In this state, which is shown in Figs. 1 and 2, the latch 19 blocks the

hoop 17 against a departure from the closed position by the engagement into the first engagement recess 21 and is to this extent in its locked position.

5 The latch 19 can be radially outwardly displaced from this locked position so that it moves out of the first engagement recess 21 and is arranged radially outside the outer radius of the hoop 17. The hoop 17 is thereby released for a departure from the closed position so that the latch 19 to this extent is in its unlocked position. The unlocked position is here not necessarily restricted to a single position of the latch 19, but can rather comprise the total range of latch positions in which the hoop 17 is released for a movement from the closed position into the open position and back. The unlocked position of the latch 19 is shown, for example, in Fig. 3.

The lock furthermore comprises a spring 23 which acts on the latch 19 and thereby preloads it against the hoop 17. As long as the latch 19 is not moved or held against this preload, the latch 19 therefore contacts an outer contour 25 of the hoop 17. Where the latch 19 respectively
15 contacts along this contour 25 here depends on the respective position of the hoop 17. The first engagement recess 21 here forms that part of the contour 25 which the latch 19 contacts in the closed position of the hoop 17. In a region which adjoins the first engagement recess 21, the contour 25 has a substantially constant radius which corresponds to the outer radius of the hoop 17. The latch 19 contacts this region at intermediate positions of the hoop 17 between its closed
20 position and its open position due to the preload and thereby substantially adopts the unlocked position shown in Fig. 3. In the unlocked position of the latch 19, the hoop 17 can be opened or closed, with the latch 19 sliding along the contour 25 of the hoop as long as it is not held at a spacing from the contour 25 as shown in Fig. 3 by the eccentric mechanism 31 against the preload of the spring 23.

25 The contour 25 extends from the first engagement recess 21 over the region having a constant radius up to a second engagement recess 27 which extends radially from outside into the hoop 17 and into which the latch 19 engages due to the preload of the spring 23 when the hoop 17 is in the open position. The second engagement recess 27 has a smaller depth than the first
30 engagement recess 21 with respect to the region of the contour 25 having a constant radius. The position of the latch 19 engaging into the second engagement recess 27 shown in Figs. 4 and 5 thereby differs from the locked position in which it is located when it engages into the

first engagement recess 21. The hoop 17 is prevented from a departure from its open position by the engagement of the latch 19 into the second engagement recess 27 so that the hoop 17 is secured against closing. The latch position shown in Figs. 4 and 5 to this extent represents a securing position of the latch 19 to be distinguished from the locked position and the unlocked position.

The latch 19 can be displaced radially outwardly in a motorized manner with respect to the shape of a partial arc of the hoop 17 against the preload of the spring 23. A drive motor 29 is provided for this purpose which is configured as an electric motor in the embodiment shown by way of example. An output shaft of the drive motor 29 drives an eccentric mechanism 31 which engages into an opening of the substantially disk-shaped latch 19 so that the latch 19 can be radially outwardly displaced against the preload in dependence on the rotational position of the eccentric mechanism 31 and can generally also be held in a specific position. The drive motor 29 is, however, only used to release the hoop 17 for a departure from the closed position (Figs. 1 and 2) or from the open position (Figs. 4 and 5) in that the latch 19 is briefly radially outwardly displaced from its locked position (Figs. 1 and 2) or from its securing position (Figs. 4 and 5) so that the engagement of the latch 19 into the first engagement recess 21 or into the second engagement recess 27 is canceled. As soon as the hoop 17 has thereupon moved out of the closed position or the open position, the drive motor 29 can be deactivated so that the latch 19 is again urged against the hoop 17 by the preload of the spring 23 and contacts the region of the contour 25 having a constant radius. The hoop 17 is thereby released for a movement between its closed position and its open position.

Since the latch 19 contacts the contour 25 as a result of the preload as long as it is not temporarily displaced or held against the preload, the state of the hoop 17 can also be determined with reference to the respective position of the latch 19. If the latch 19 is in the locked position, the hoop 17 can only be in the closed position. In a corresponding manner, the hoop 17 can only be in the open position when the latch 19 is in the securing position. If the latch 19 is, in contrast, in the unlocked position, in particular in the position in which it contacts the region of the contour 25 having a constant radius, the hoop 17 is in an intermediate position between the open position and the closed position. The requirement for the information to be able to be detected is, however, that the locked position, the securing

position, and the unlocked position can be reliably distinguished even though the stroke of the latch 19, which is in particular defined by the spacing of the locked position shown in Figs. 1 and 2 from the unlocked position shown in Fig. 3, is very small under certain circumstances, in the present example only amounts to approximately 4 mm.

5

For a nevertheless reliable detection of the latch position, a lever 33 is provided within the lock body 13 which is arranged substantially in parallel with the drive motor 29 and is largely hidden by the drive motor 29 in Figs. 1 to 4. In Fig. 5, in contrast, the lever 33 can be seen almost completely since the drive motor 29 and the eccentric mechanism 31 are removed in

10 Fig. 5. The lever 33 is configured as a flat, straight bar which extends from a coupling section 35 up to a deflection section 37. The lever 33 is here pivotably supported about a pivot point 39 at the lock body 13. The latch 19 is here arranged movably substantially tangential to the pivot axis of the lever 33 defined by the pivot point 39. The lever 33 is movement-coupled to the latch 19 via the coupling section 35 so that the lever 33 is pivoted about the pivot point 39 on a
15 displacement of the latch 19. The movement coupling of the lever 33 with the latch 19 in this respect takes place in that the coupling section 35 engages into a cutout of the latch 19.

Since the coupling section 35 is provided at a first end of the lever 33 and the deflection section 37 is provided at a second end of the lever 33 opposite the first ends at a spacing from the pivot
20 point 39 which is approximately twice as large as the coupling section 35, on a movement of the coupling section 35, the deflection section 37 executes a movement which is approximately twice as large in comparison therewith. In this manner, the three positions of the deflection section 37 corresponding to the locked position, to the unlocked position, and to the securing position of the latch 19 differ more from one another than these latch positions themselves. The
25 latch positions can therefore be more reliably distinguished by means of a sensor 41 (cf. Figs. 2 and 3) which is arranged adjacent to the deflection section 37 of the lever 33 and which detects the position of the deflection section 37 than if they were directly detected with reference to the latch 19. In addition, the sensor 41 can in this manner be arranged outside the contamination region of the latch 19 and can instead also be arranged in the proximity of electronics (not
30 shown) inter alia provided to control the drive motor 29.

The sensor 41 is a magnetic sensor in the manner of a Hall sensor or of a magnetic field sensor which is in particular configured for a three-dimensional magnetic detection. The sensor 41 here cooperates with a permanent magnet 43 which is arranged at the deflection section 37 of the lever 33 and whose magnetic field the sensor 41 detects. The configuration of the sensor 41 as a 3D sensor makes it possible here to reliably distinguish by means of a single sensor 41 at least the three positions of the deflection section 37 of the lever 33 which correspond to the locked position, to the unlocked position, and to the securing position on the basis of the movement coupling of the latch 19 to the coupling section 35 of the lever 33.

Reference numerals

	11	frame lock
	13	lock body
5	15	plate
	17	hoop
	19	latch
	21	first engagement recess
	23	spring
10	25	contour
	27	second engagement recess
	29	drive motor
	31	eccentric mechanism
	33	lever
15	35	coupling section
	37	deflection section
	39	pivot point
	41	sensor
	43	permanent magnet

Patentkrav

1. Lås (11), særligt til et tohjulet køretøj, som foretrukket i det mindste delvist kan drives motorisk, med

- et låselegeme (13),
- 5 - en bøjle (17), som kan bevæges mellem en åben position og en lukket position,
- en rigel (19), som er lejret bevægeligt på låselegemet (13) mellem en låseposition, i hvilken den forhindrer bøjlen (17) i dennes lukkede position i at forlade den lukkede position, og en oplåsningposition, i hvilken den frigør bøjlen (17),
- en sensor (41) til registrering af rigelpositionen, samt
- 10 - en bevægeligt lejret arm (33),

hvor et koblingsafsnit (35) af armen (33) er bevægelseskoblet med riglen (19),

hvor armen (33) er lejret på en sådan måde, at et forskydningsafsnit (37) af armen (33) med afstand til koblingsafsnittet (35) ved en bevægelse af koblingsafsnittet (35) udfører en større bevægelse sammenlignet hermed,

15 hvor sensoren (41) til registrering af rigelpositionen registrerer positionen af armens (33) forskydningsafsnit (37),

hvor

riglen (19) er forspændt mod bøjlen (17), sådan at den ligger op ad en kontur (25) af bøjlen (17),

20 hvor

konturen (25) af bøjlen (17) er udformet sådan, at riglen (19) som følge af forspændingen

- i bøjle (17) lukkede position indtager sin låseposition,
- i stillinger af bøjlen (17), som ligger mellem bøjle (17) lukkede position og åbne position, indtager sin oplåsningposition og
- 25 - i bøjle (17) åbne position indtager en sikringsposition, afvigende fra låsepositionen og oplåsningpositionen, som foretrukket ligger mellem låsepositionen og oplåsningpositionen,

og hvor der ved hjælp af sensoren (41) pålideligt kan skelnes mellem i det mindste de tre positioner af armens (33) forskydningsafsnit (37), som svarer til rigle (19) låseposition, oplåsningposition og sikringsposition.

30

2. Lås ifølge krav 1,

hvor armen (33) er drejeligt lejret omkring et drejepunkt (39).

3. Lås ifølge krav 2,

5 hvor drejepunktet (39) er tilvejebragt mellem koblingsafsnittet (35) og forskydningsafsnittet (37).

4. Lås ifølge i det mindste et af de foregående krav,

hvor koblingsafsnittet (35) er tilvejebragt på en første ende af armen (33) og

10 forskydningsafsnittet (37) på en anden ende af armen (33) modsat den første ende.

5. Lås ifølge i det mindste et af de foregående krav,

hvor bøjlen (17) i det mindste delvist er anbragt inde i låselegemet (13), og riglen (19) og armen (33) er anbragt helt inde i låselegemet (13).

15

6. Lås ifølge i det mindste et af de foregående krav,

hvor forskydningsafsnittet (37) samarbejder magnetisk med sensoren (41).

7. Lås ifølge krav 6,

20 hvor forskydningsafsnittet (37) har en permanentmagnet (43), og sensoren (41) er udformet som magnetisk sensor, særligt en Hall-sensor eller en magnetfeltsensor, hvor sensoren (41) foretrukket er udformet til tredimensionel magnetisk registrering.

25 **8.** Lås ifølge krav 6 eller 7,

hvor låsen omfatter et inderhus, foretrukket lukket i hele omkredsen, anbragt inde i låselegemet (13), hvor sensoren (41) er anbragt inde i inderhuset, og armen (33) er anbragt uden for inderhuset.

30 **9.** Lås ifølge i det mindste et af de foregående krav, hvor armen (33) er lejret på en sådan måde, at den har en enkelt frihedsgrad.

10. Lås ifølge i det mindste et af de foregående krav, hvor låsen omfatter en drivmotor (29) til bevægelse af riglen (19).

11. Lås ifølge krav 10,

5 hvor armen (33) i det væsentlige er orienteret parallelt med drivmotoren (29).

12. Lås ifølge i det mindste et af de foregående krav,

hvor bøjlen (17) har en første indgrebsfordybning (21), som riglen (19) kan gribe ind i, når bøjlen (17) er i den lukkede position, for at forhindre bøjlen (17) i at forlade den lukkede position.

10

13. Lås ifølge krav 12,

hvor bøjlen (17) har en anden indgrebsfordybning (27), som riglen (19) kan gribe ind i, når bøjlen (17) er i den åbne position, for at forhindre bøjlen (17) i at forlade den åbne position.

15

14. Lås ifølge krav 13,

hvor konturen (25) af bøjlen (17) har den første indgrebsfordybning (21) og den anden indgrebsfordybning (27), så riglen (19) som følge af forspændingen

- i bøjlen (17) lukkede position griber ind i den første indgrebsfordybning (21), hvor

20

riglens (19) låseposition defineres af indgrebsdybden, og

- i bøjlen (17) åbne position griber ind i den anden indgrebsfordybning (27), hvor

riglens (19) sikringsposition defineres af indgrebsdybden.

25

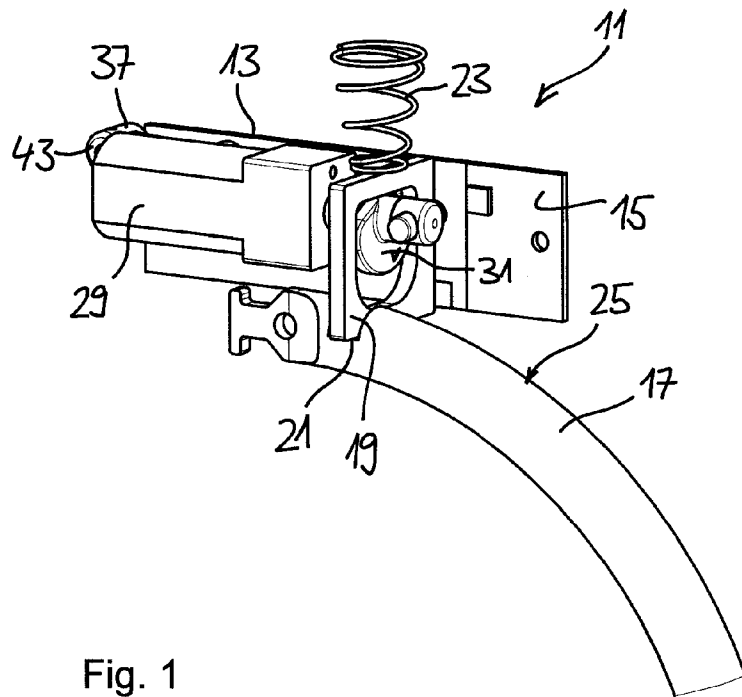


Fig. 1

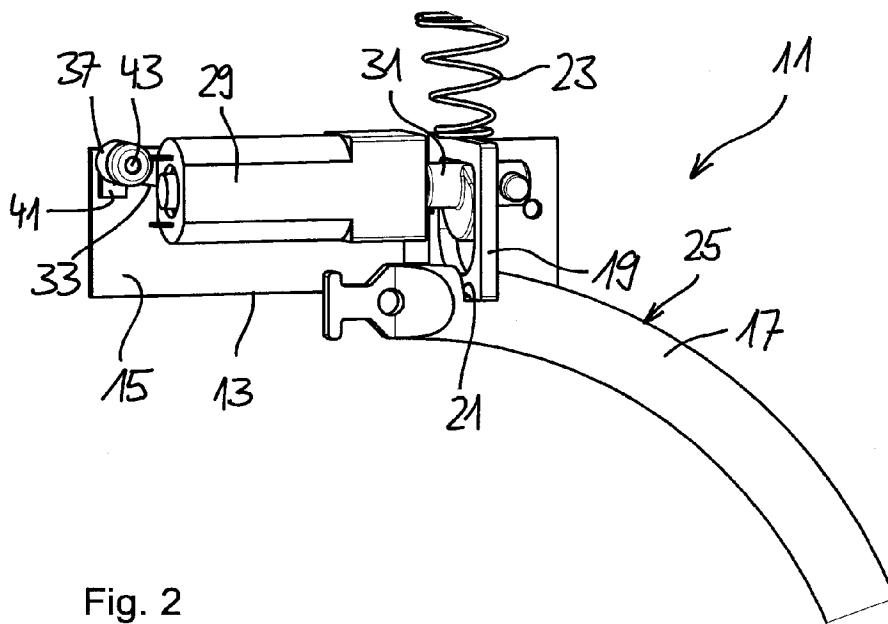


Fig. 2

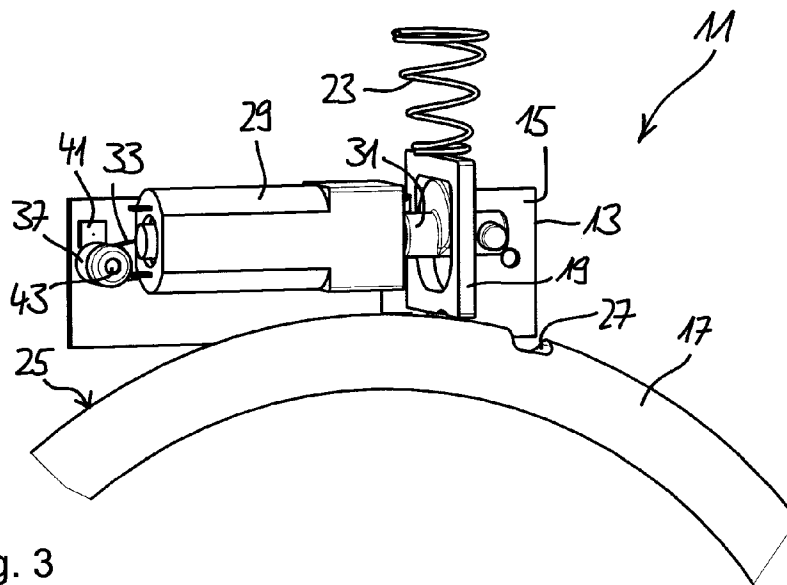


Fig. 3

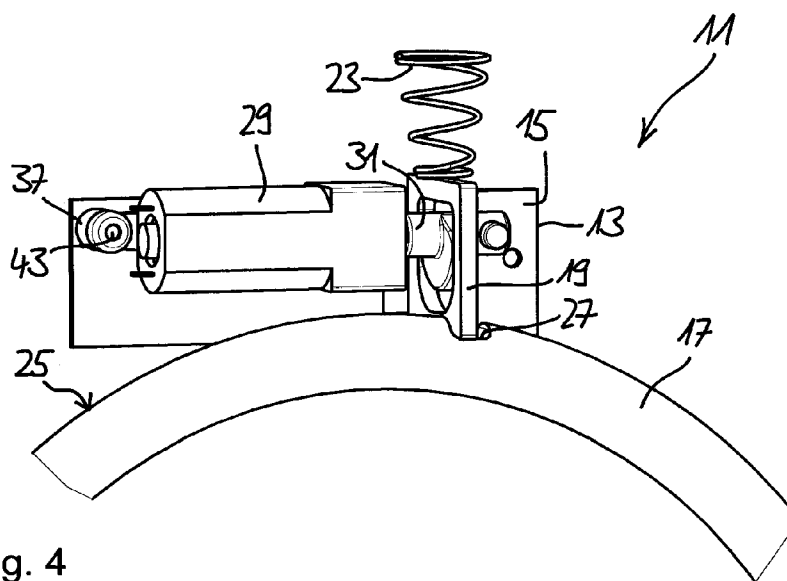


Fig. 4

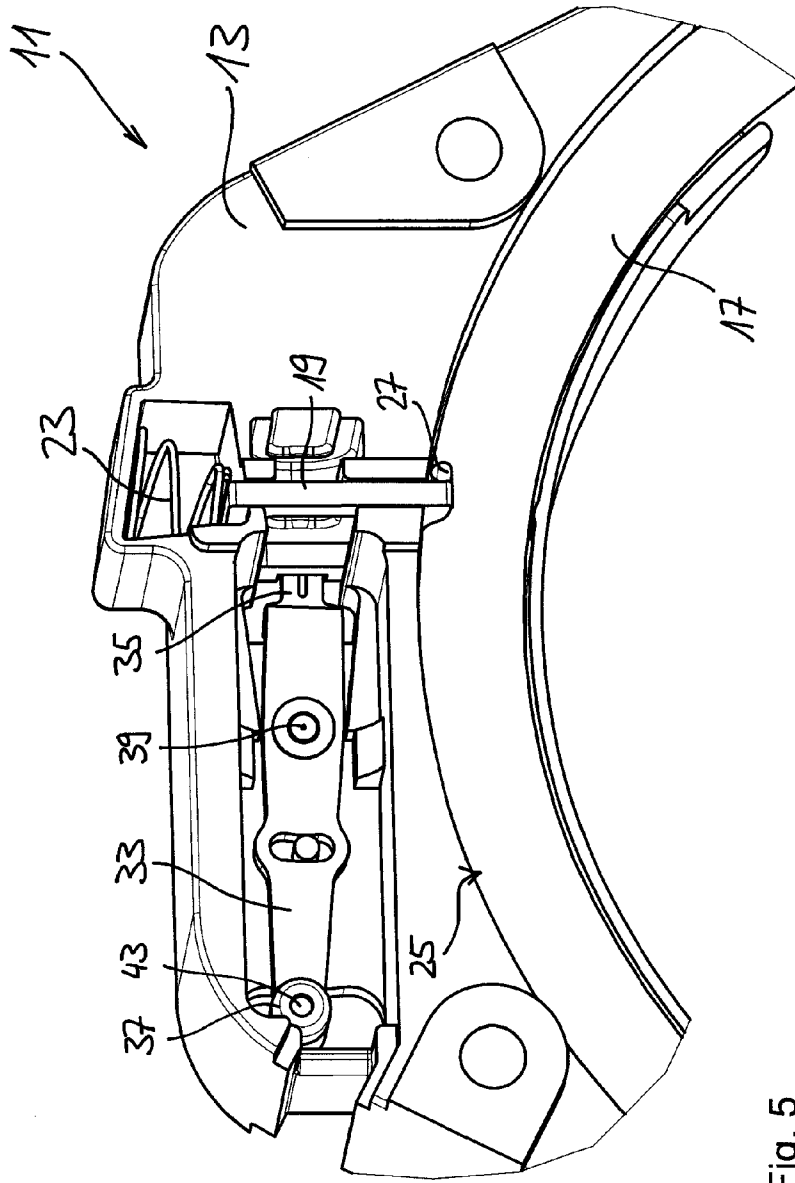


Fig. 5