

Passage barrier

The invention relates to a passage barrier for controlling the access to a building or a site, having
5 a blocking element which, in order to grant access, is pivotable or rotatable by a defined angle from a blocking position in both directions about an axis, a drive motor and an overload clutch with adjustable limit torque.

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Passage barriers serve to control the access of persons to, for example, buildings or installations, such as railroad stations, airports, corporate sites, etc. in a manner such that subsequent to some type of
15 authorization check or identity check only authorized persons are granted access individually, in that a blocking element of the passage barrier is moved from a position which blocks the passage to a position which opens the passage, and the blocking element is
20 immediately returned to a position which blocks the passage once an authorized person has passed through the passage barrier. However, exiting a building or an installation should be readily possible for all persons without any authorization check or identity check. The
25 possibility of exiting a building or an installation as far as possible without obstruction is required above all for safety reasons, e.g. in a situation of imminent danger or in the event of a panic breaking out. It is known for access to a building or an installation to be
30 controlled by a passage barrier, but for a separate exit therefrom to be provided for exiting the building or the installation. However, there is also the desire that the same passage may be used for entering and exiting a building or an installation, whilst adhering
35 to the applicable security regulations, of course.

Known passage barriers which permit passage in both directions as described, for example, in DE 10 2008 010 671 A1 are equipped with an overload friction clutch which has the same limit torque in both

directions. For safety reasons, the torque which has to be overcome on the clutch of the passage barrier when exiting a building or an installation should be limited. For example, according to an existing but not
5 generally applicable regulation the force to be applied to the leading edge of a pivotable blocking wing should be at maximum 750 N. In a clutch which has the same limit torque in both directions, however, the limit torque to be overcome for access is also limited to
10 this rather low value by this safety regulation.

It has, however, been found that unauthorized persons have increasingly also been able to gain access to a building or an installation by forcing the blocking
15 element into its open position, which was facilitated by the torque limited in both directions being low and comparatively easy to overcome.

It is an object of the invention to provide a passage
20 barrier at which the access to a building or an installation is controlled effectively and the risk of unauthorized persons gaining uncontrolled access, and even forcibly so by vandalism, is eliminated as far as possible, but exiting the building or the installation,
25 e.g. in a situation of imminent danger or in the event of a panic breaking out, through the same barrier is possible in an uncontrolled and largely unobstructed manner.

30 According to the invention this is achieved with a passage barrier according to claim 1.

By configuring the clutch between the drive motor and the blocking element as an asymmetrical overload
35 clutch, the torque to be overcome in the access direction can be made higher than the torque to be overcome in the exit direction. In this manner, effective access control, which is secure even in the

event of force being used to a building or a site, can be achieved, while at the same time permitting the building or the site to be exited largely without obstruction.

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The torque to be overcome should thus be greater in the direction of access to a building or site than in the direction of exit. For example, in a situation of imminent danger or in the event of panic breaking out
10 this overload clutch may then be overcome comparatively easily in the exit direction, this also considerably minimizing the risk of injuries.

Preferably the torque to be overcome in the direction
15 of the access to a building or site should be approximately double that of the direction of the exit. On account of this, a sufficiently high level of resistance against any access gained by force can be achieved, without the required installation space for
20 the overload clutch being increased.

The invention is explained in more detail in the following with reference to the accompanying drawing, in which:

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Figure 1 shows the lower part of a passage barrier and

Figure 2 shows a detail of an overload clutch of the passage barrier according to the invention.

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Figure 1 shows a passage barrier having a blocking wing 2 as blocking element, said blocking wing 2 being pivotable in both directions by approximately 90° about a column 1 from a position which blocks the passage. A
35 drive shaft (not visible in the drawing), which implements the pivoting movement of the blocking wing 2, extends inside the column 1. Said drive shaft penetrates the plate 3 of a table-like base 4 and is

connected beneath the plate 3 to the output shaft of a drive motor 5 via an overload clutch 7. For the safe operation of the passage barrier, a locking unit 6 is additionally provided which securely holds the blocking wing 2 in its closed position and its open position and which permits the drive motor 5, or the blocking wing 2 respectively, to be stopped in short steps or also in any position.

- 10 According to the invention, the overload clutch 7 is configured asymmetrically, meaning that the torque to be overcome at said overload clutch 7 in the one pivoting direction of the blocking wing 2, or of any other blocking element, differs from the torque which
- 15 has to be overcome at said overload clutch 7 in the other pivoting direction, and specifically that the torque which has to be overcome for the access is greater than the torque which has to be overcome at said overload clutch 7 in the exit direction.
- 20 Preferably the torque for the access is about double the torque for exiting a building or an installation; according to presently known safety regulations, for the access this would thus be approximately 1500 N on the front side of the blocking wing. This is considered
- 25 on the one hand as being sufficient for effective access control which denies access with a high level of reliability to unauthorized persons even when they are using force; on the other hand, this is implementable also in the usually only small installation space
- 30 available at a passage barrier, because an overload clutch having this maximum torque does not require more space than one of the overload friction clutches used to date.
- 35 Various possibilities are conceivable for implementing such an asymmetrical overload clutch. Overload clutches are known in which balls are located between an outer and an inner clutch body, said balls being able to roll

in raceways provided on the clutch bodies. The raceway of the one (outer) clutch body has conical depressions into which the balls are pressed by, for example, a spring arrangement. Once the balls have locked home in the depressions, a form fit is present between the two clutch bodies. Once the torque of the clutch, which has been preset by e.g. a setting nut generating pretension, is exceeded in a clutch outer body blocked by a blocking unit, the balls are released from the depressions in the ball raceway of the clutch outer body, the form fit is released and the inner clutch body can rotate in relation to the outer, blocked clutch body. In known clutches the depressions are configured symmetrically, e.g. conically, with identically inclined flanks; the limit torque which has to be overcome in order to release the clutch is thus the same in both directions of rotation.

According to one embodiment of the invention, the depressions 8 are configured asymmetrically, e.g. conically, with asymmetrical flanks 9, 10, i.e. the one flank 9 extends more steeply, the other flank 10 extends in a more gently sloped manner. It is thus ensured that the torque to be overcome in the direction of the steep flank 9 is greater than the torque to be overcome in the direction of the gently sloped flank 10. For a passage barrier according to the invention, the pivoting movement of the blocking element 2 therefore has to be implemented in the direction of the steep flank 9 for the controlled access; for as far as possible unobstructed exiting the pivoting movement of the blocking element 2 has to occur in the direction of the gently sloped flank 10.

Other embodiments of an asymmetrical overload clutch are conceivable.

List of reference signs

- 1 Column
- 2 Blocking element, blocking wing
- 3 Plate
- 4 Base
- 5 Drive motor
- 6 Locking unit
- 7 Overload clutch
- 8 Depressions
- 9 Steep flank
- 10 Gently sloped flank

Patent claims

1. A passage barrier for controlling the access to a building or a site, having a blocking element which, in order to grant access, is pivotable or rotatable by a defined angle from a blocking position in both directions about an axis, a drive motor and an overload clutch with adjustable limiting torque, characterized in that the clutch is configured as asymmetrical overload clutch (7) and the limiting torque to be overcome in the one direction of rotation is greater than in the other direction of rotation.
2. The passage barrier as claimed in claim 1, characterized in that the limit torque to be overcome in the direction of the access to a building or a site is greater than in the direction of the exit.
3. The passage barrier as claimed in claim 2, characterized in that the limit torque to be overcome in the direction of the access to a building or a site is approximately double that in the direction of the exit.