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(54) **Door checks for vehicles**

Türfeststeller für Kraftwagentüren

Arrêt de porte pour véhicules automobiles

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Description

[0001] This invention relates to door checks for vehicles of the kind in which a link in the form of a strap adapted to be pivotally connected at one end to a door frame is withdrawn through a housing mounted on a complementary part of the door against a restraining force applied to the strap by the frictional co-operation with the strap of a restraining mechanism housed within the housing.

[0002] Most known door checks of the kind set forth include metal housings which are relatively heavy and relatively expensive to produce.

[0003] A door check is known from FR-A-2664323 in which the housing has a U-shaped centre portion between two planar wing portions. The restraining mechanism comprises first and second rollers located between spaced side walls of the centre portion. The first roller is journalled for rotation about a fixed axis and the second roller is carried by an arm pivotal about a fixed axis and biased towards the first roller to apply a restraining force to a link extending between the rollers. The arm is carried by an axle which extends between the side walls. The ends of the axle project from the side walls and overlie the wing portions on either side of the centre portion. The biasing is provided by a pair of springs mounted on the projecting ends of the axle.

[0004] Another door check is known from FR-A-1097184 in which the housing comprises a U-shaped bracket with opposed side walls and a connecting base wall. The restraining mechanism includes a first roller journalled for rotation about a fixed axis between the side walls and a second roller pivotally and slidably supported between a pair of straps connected to the bracket. The second roller is biased towards the first roller to apply a restraining force to a link extending between the rollers by a spring located between the straps.

[0005] According to our invention, there is provided a door check for vehicles comprising a link in the form of a strap adapted to be pivotally connected at one end to a door frame, a housing adapted to be mounted on a complementary part of a door, the link being adapted to be withdrawn through the housing under the control of a restraining mechanism arranged to apply a restraining force by frictional co-operation with opposite faces of the link, the housing being of substantially U-shape having a pair of spaced limbs, and the restraining mechanism comprising a first roller journalled for rotation about a fixed axis extending between the limbs, a second roller carried by an arm angularly movable about a pivot axis extending between the limbs, and a spring biasing the second roller towards the first roller, and the link being so profiled that the resistance to movement of the link between the rollers varies during the length of its travel characterised in that the housing comprises a pressed metal casing or bracket, the second roller is arranged between the first roller and an end plate integral with and connecting the limbs and the spring is arranged between the limbs and acts between the end plate and the arm for biasing the second roller away from the end plate towards the first roller.

[0006] By this invention, there is provided a light-weight door check which is simple in construction and cheap to produce.

[0007] Preferably the resistance to movement of the link through the rollers is smallest at a position of minimum travel, such as when the door is in a closed position, and increases as the door approaches an intermediate or a fully open position.

[0008] The fully opened position may be defined by the co-operation of an abutment on the link with at least one of the rollers to form a bump stop.

[0009] One of the faces of the link may be planar and the other face may be of an irregular or undulating outline so that the resistance to movement of the link varies throughout the length of its travel. For example, the other face may include an inclined face leading into axially spaced recesses adapted to receive one of the rollers whereby to define intermediate open positions for the door.

[0010] One embodiment of our invention is illustrated in the accompanying drawings in which:-

Figure 1 is an inverted plan view of a door check for a vehicle door with the link omitted for clarity;

Figure 2 is an end view of the check; and

Figure 3 is a section on the line 3-3 of Figure 2 and including the link.

[0011] The door check illustrated in the drawings comprises a housing 1 in the form of a light-weight pressed metal casing or bracket of generally U-shaped outline including spaced limbs 2, 3 which depend from an end plate 4. The limbs 2, 3 terminate at their distal ends in oppositely directed cranked portions comprising a pair of aligned lugs 5 which provide mountings for fixing studs 6 by means of which the casing can be secured to a vehicle door.

[0012] A roller 7 is journalled for rotation on a pin 8 fixedly secured at opposite ends in the limbs 2 and 3, and a second roller 9 is rotatably mounted in a recess 10 at the inner end of an arm 11 in the form of a rocker of which the outer end is mounted for angular movement about a pivot pin 12 also extending between the limbs 2 and 3. A compression spring 13 acts between the arm 11 and the end plate 4 to urge the roller 9 towards the roller 7.

[0013] A link 20 in the form of a profiled strap extends through the housing 1 between the rollers 9 and 7 with a restraining force applied to it by the load in the spring 13 which is transmitted through the arm 11. The link 20 has a planar upper surface with which the movable roller 9 is in rolling engagement, and a lower surface of irregular or undulating configuration. As illustrated the link

20 at one end is provided with an opening 21 to form a pivotal connection with a door frame and which is disposed at all times on one side of the housing 1. A portion 22 of constant thickness leads from the opening 21 to an outwardly inclined face 23, and the face 23 in turn, leads into a second, parallel sided portion 24 of greater thickness than the portion 22. The portion 24 terminates at an enlarged abutment 26 at the opposite free end of the link 20. A pair of axially spaced semi-circular recesses 27, 28 are formed in the portion 24, spaced axially between the inclined face 23 and the abutment 26.

[0014] When the door check is installed in a vehicle and the door is in the closed position, the relative positions of the link 20 and the housing 1 are similar to that shown in Figure 3 with a minimum restraining force applied to the link 20 since the arm 11 is at an extreme position. As the door is opened and the link 20 is withdrawn through the rollers 7 and 9, the resistance to movement of the link 20 increases as the roller 7 engages with the inclined face 23 and which provides a gradual lead into the portion 24.

[0015] At this point the resistance to movement is increased due to compression of the spring 13 caused by angular movement of the arm 11, in order to accommodate the increased effective width of the link 20 at that point. Further movement in the same direction causes the roller 7 to be received in the recess 27 to define a first intermediate open position. If this position is insufficient for the needs of the occupant of the vehicle then the door may be opened further with the roller 7 being received in the recess 28 to define a second intermediate open position. Further movement of the door in the same direction to disengage the roller 7 from the recess 28 causes the abutment 26 to engage with the roller 7 and define a bump stop limiting further travel of the link 20 and limiting further movement of the door in a opening direction.

[0016] In the construction described above the resistance to movement of the link 20 through the rollers 7, 9 is smallest at a position of minimum travel, when the door is substantially in a closed position, and increases as the door approaches an intermediate or fully open position.

[0017] In a modification the fixing stud 6 may be omitted, the housing 1 may be fixed to the door by the use of separate screws screwed into tapped holes in the lugs 5.

Claims

1. A door check for vehicles comprising a link (20) in the form of a strap adapted to be pivotally connected at one end (21) to a door frame, a housing (1) adapted to be mounted on a complementary part of a door, the link (20) being adapted to be withdrawn through the housing (1) under the control of a restraining mechanism arranged to apply a restraining force by frictional co-operation with opposite faces of the link (20), the housing (1) being of substantially U-shape having a pair of spaced limbs (2,3), and the restraining mechanism comprising a first roller (7) journalled for rotation about a fixed axis extending between the limbs (2,3), a second roller (9) carried by an arm (11) angularly movable about a pivot axis extending between the limbs (2,3), and a spring (13) biasing the second roller (9) towards the first roller (7), and the link (20) being so profiled that the resistance to movement of the link (20) between the rollers (7,9) varies during the length of its travel characterised in that the housing (1) comprises a pressed metal casing or bracket, the second roller (9) is arranged between the first roller (7) and an end plate (4) integral with and connecting the limbs (2,3), and the spring (13) is arranged between the limbs (2,3) and acts between the end plate (4) and the arm (11) for biasing the second roller (9) away from the end plate (4) towards the first roller (7).

2. A door check as claimed in claim 1, characterised in that one of the faces of the link (20) is planar and the other face is of an irregular or undulating outline so that the resistance to movement of the link (20) varies throughout the length of its travel.

3. A door check as claimed in claim 1, characterised in that the link (20) has an opening (21) at one end for pivotal connection with the door frame, a first portion (22) of constant thickness leading from the opening (21) to an outwardly inclined face (23) which in turn leads to a second, parallel sided portion (24) of greater thickness than the first portion (22).

4. A door check as claimed in any preceding claim, characterised in that the resistance to movement of the link (20) through the rollers (7,9) is smallest at a position of minimum travel, such as when the door is in a closed position, and the resistance to movement increases as the door approaches an intermediate or a fully open position.

5. A door check as claimed in claim 4, characterised in that the link (20) has an abutment (26) forming a bump stop co-operable with the first roller (7) to define the fully opened position of the door.

6. A door check as claimed in claim 4 or claim 5, characterised in that the link (20) has axially spaced recesses (27,28) adapted to receive the first roller (7) to define intermediate open positions of the door.

7. A door check as claimed in any preceding claim, characterised in that the first roller (7) is journalled for rotation about a pivot pin (8) fixedly secured at

opposite ends in the limbs (2,3).

8. A door check as claimed in any preceding claim, characterised in that the second roller (9) is journalled for rotation in a recess (10) at one end of the arm (11) and the other end of the arm (11) is mounted for angular movement about a pivot pin (12) extending between the limbs (2,3).

9. A door check as claimed in any preceding claim, characterised in that the limbs (2,3) terminate at their distal ends in oppositely directed cranked portions comprising a pair of aligned lugs (5) adapted for mounting the housing (1) on a door.

Patentansprüche

1. Türfeststeller für Kraftwagentüren, der eine Verbindung (20) in Form einer Lasche aufweist, die so angepaßt ist, daß sie an einem Ende (21) mit einem Türrahmen drehbar verbindbar ist, ein Gehäuse (1), das so angepaßt ist, daß es an einem Komplementärteil einer Tür anbringbar ist, wobei die Verbindung (20) so angepaßt ist, daß sie unter der Kontrolle eines Rückhaltemechanismus, der so angeordnet ist, daß er eine Rückhaltekraft durch Reibungszusammenwirkung mit entgegengesetzten Flächen der Verbindung (20) aufbringt, durch das Gehäuse (1) zurückgezogen wird, wobei das Gehäuse (1) im wesentlichen eine U-Form mit einem Paar voneinander beabstandeter Teile (2,3) aufweist, und wobei der Rückhaltemechanismus eine erste Rolle (7) umfaßt, die um eine feste, sich zwischen den Teilen (2,3) erstreckende Achse herum drehbar auf einem Zapfen gelagert ist, eine zweite Rolle (9), die durch einen Arm (11) getragen ist, der winklig um eine sich zwischen den Teilen (2,3) erstreckende Drehachse herum drehbar gelagert ist, und eine Feder (13), die die zweite Rolle (9) in Richtung der ersten Rolle (7) vorspannt, wobei die Verbindung (20) ein Profil aufweist, das so gestaltet ist, daß sich der Widerstand gegen die Bewegung der Verbindung (20) zwischen den Rollen (7,9) über die Länge ihrer Bewegungsstrecke verändert,
dadurch gekennzeichnet, daß
das Gehäuse (1) eine Verkleidung oder Halterung aus gepreßtem Metall aufweist, wobei die zweite Rolle (9) zwischen der ersten Rolle (7) und einer mit den Teilen (2,3) integralen und diese verbindenden Endplatte (4) angeordnet ist, wobei die Feder (13) zwischen den Teilen (2,3) angeordnet ist und so zwischen der Endplatte (4) und dem Arm (11) wirkt, daß sie die zweite Rolle (9) weg von der Endplatte (4) in Richtung der ersten Rolle (7) vorspannt.

2. Türfeststeller nach Anspruch 1,
dadurch gekennzeichnet, daß
eine der Flächen der Verbindung (20) plan ist und die andere Fläche einen unregelmäßigen oder wellenförmigen Umriß aufweist, so daß sich der Widerstand gegen die Bewegung der Verbindung (20) über die Länge ihrer Bewegungsstrecke verändert.

3. Türfeststeller nach Anspruch 1,
dadurch gekennzeichnet, daß
die Verbindung (20) zur drehbaren Verbindung mit dem Türrahmen an einem Ende eine Öffnung (21) aufweist, wobei ein erster Bereich (22) konstanter Dicke von der Öffnung (21) zu einer nach außen geneigten Fläche (23) hinführt, die ihrerseits zu einem zweiten Bereich (24) mit parallelen Seiten führt, der eine größere Dicke als der erste Bereich (22) aufweist.

4. Türfeststeller nach einem der vorangegangenen Ansprüche,
dadurch gekennzeichnet, daß
der Widerstand gegenüber der Bewegung der Verbindung (20) durch die Rollen (7,9) an einer Position minimaler Bewegungsstrecke am kleinsten ist, beispielsweise wenn sich die Tür in geschlossener Position befindet, und daß der Widerstand gegenüber der Bewegung ansteigt, wenn sich die Tür einer mittleren oder einer vollständig geöffneten Position nähert.

5. Türfeststeller nach Anspruch 4,
dadurch gekennzeichnet, daß
die Verbindung (20) ein Widerlager (26) aufweist, das aus einem mit der ersten Rolle (7) zusammenwirkenden Anschlagpuffer gebildet ist, um die vollständig geöffnete Position der Tür zu definieren.

6. Türfeststeller nach Anspruch 4 oder 5,
dadurch gekennzeichnet, daß
die Verbindung (20) axial voneinander beabstandete Ausnehmungen (27,28) aufweist, die so angepaßt sind, daß sie die erste Rolle (7) aufnehmen, um mittlere Öffnungspositionen der Tür zu definieren.

7. Türfeststeller nach einem der vorangegangenen Ansprüche,
dadurch gekennzeichnet, daß
die erste Rolle (7) um einen Gelenkbolzen (8) herum drehbar gelagert ist, der fest mit gegenüberliegenden Enden in den Teilen (2,3) befestigt ist.

8. Türfeststeller nach einem der vorangegangenen Ansprüche,
dadurch gekennzeichnet, daß
die zweite Rolle (9) in einer Ausnehmung (10) an einem Ende des Armes (11) drehbar gelagert und das andere Ende des Armes (11) winklig um einen sich zwischen den Teilen (2,3) erstreckenden Dreh-

zapfen (12) herum drehbar gelagert ist.

9. Türfeststeller nach einem der vorangegangenen Ansprüche,
dadurch gekennzeichnet, daß
die Teile (2,3) an ihren distalen Enden in Form von zueinander gegensätzlich ausgerichteten, gebogenen Bereichen enden, die ein Paar ausgerichteter Ansätze (5) aufweisen, die so angepaßt sind, daß das Gehäuse (1) an einer Tür anbringbar ist.

Revendications

1. Arrêt de porte pour véhicules comprenant une charnière (20) en forme d'attache adaptée pour être reliée de façon pivotante à une extrémité (21) à un châssis de porte, un boîtier (1) adapté pour être monté sur une partie complémentaire d'une porte, la charnière (20) étant adaptée pour être retirée par le boîtier (1) en commandant un mécanisme de retenue disposé pour appliquer une force de retenue par concours de frottement avec des faces opposées de la charnière (20), le boîtier (1) étant d'une forme sensiblement en U ayant deux membres espacés (2, 3), et le mécanisme de retenue comprenant une première roulette (7) tourillonnée pour tourner autour d'un axe fixe s'étendant entre les membres (2, 3), une deuxième roulette (9) supportée par un bras (11) déplaçable de façon angulaire par rapport à un axe de pivot s'étendant entre les membres (2, 3), et un ressort (13) qui sollicite la deuxième roulette (9) vers la première roulette (7), et la charnière (20) étant profilée de manière telle que la résistance au mouvement de la charnière (20) entre les roulettes (7, 9) varie pendant la longueur de son parcours, caractérisé en ce que le boîtier (1) comprend un boîtier ou un support en métal comprimé, la deuxième roulette (9) est disposée entre la première roulette (7) et une plaque terminale (4) constituant une seule pièce avec les membres (2, 3) et les reliant, et le ressort (13) est disposé entre les membres (2, 3) et agit entre la plaque terminale (4) et le bras (11) pour solliciter la deuxième roulette (9) à distance de la plaque terminale (4) vers la première roulette (7).

2. Arrêt de porte selon la revendication 1, caractérisé en ce que l'une des faces de la charnière (20) est plane et l'autre face est d'un contour irrégulier ou ondulé, de sorte que la résistance au mouvement de la charnière (20) varie sur toute la longueur de son parcours.

3. Arrêt de porte selon la revendication 1, caractérisé en ce que la charnière (20) a une ouverture (21) à une extrémité pour une liaison de pivotement avec le châssis de porte, une première portion (22) d'épaisseur constante conduisant de l'ouverture (21) à une face (23) inclinée vers l'extérieur qui, à son tour, conduit à une deuxième portion (24) latérale parallèlement plus épaisse que la première portion (22).

4. Arrêt de porte selon l'une des revendications précédentes, caractérisé en ce que la résistance au mouvement de la charnière (20) à travers les roulettes (7, 9) est plus petite à une position de parcours minimum, comme lorsque la porte est dans une position fermée, et la résistance au mouvement augmente lorsque la porte approche d'une position intermédiaire ou totalement ouverte.

5. Arrêt de porte selon la revendication 4, caractérisé en ce que la charnière (20) a une butée (26) qui forme un arrêt-butoir pouvant concourir avec la première roulette (7) pour définir la position totalement ouverte de la porte.

6. Arrêt de porte selon la revendication 4 ou la revendication 5, caractérisé en ce que la charnière (20) a des évidements espacés de façon axiale (27, 28) adaptés pour loger la première roulette (7) pour définir des positions ouvertes intermédiaires de la porte.

7. Arrêt de porte selon l'une des revendications précédentes, caractérisé en ce que la première roulette (7) est tourillonnée pour tourner autour d'un tourillon de pivot (8) attaché de façon fixe aux extrémités opposées des membres (2, 3).

8. Arrêt de porte selon l'une des revendications précédentes, caractérisé en ce que la deuxième roulette (9) est tourillonnée pour tourner dans un évidement (10) à une extrémité du bras (11) et l'autre extrémité du bras (11) est montée pour un mouvement angulaire autour d'un tourillon de pivot (12) qui s'étend entre les membres (2, 3).

9. Arrêt de porte selon l'une des revendications précédentes, caractérisé en ce que les membres (2, 3) se terminent à leurs extrémités distales dans des parties contre-coudées dirigées de façon opposée qui comprennent deux talons alignés (5) adaptés pour monter le boîtier (1) sur une porte.

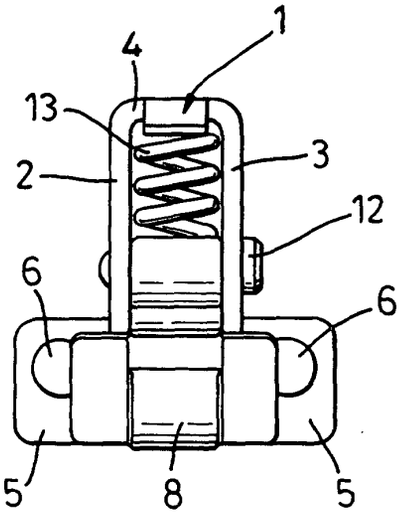

Fig.1

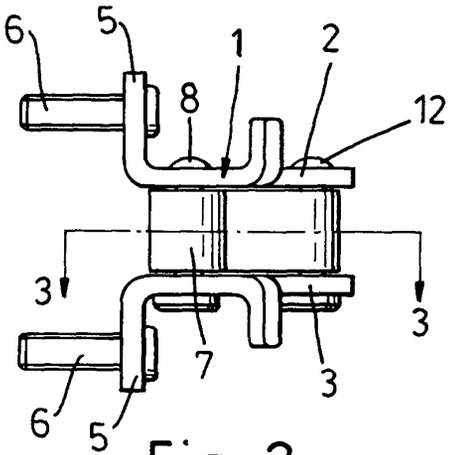

Fig. 2

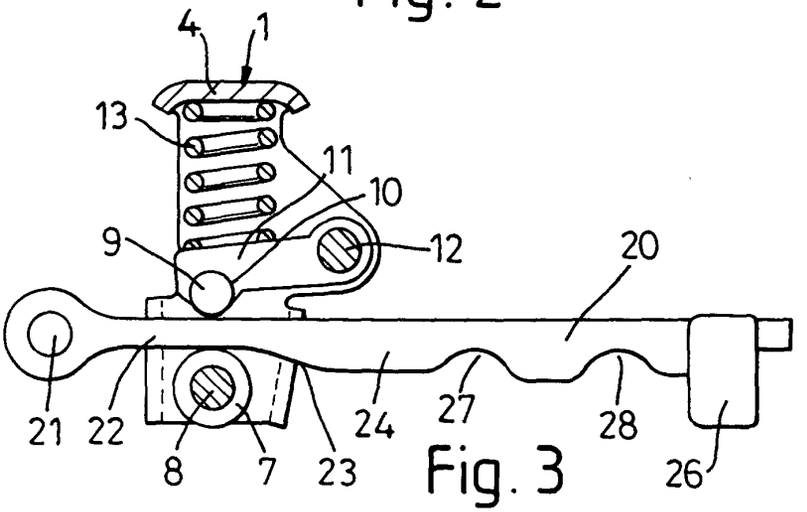

Fig. 3