CLAIMS

1. A hinge device (1) for operating the opening and closing of a door (100) fastened to a frame (101) of a vehicle, configured so that the door (100) does not change orientation during said operation, wherein the hinge device (1) comprises an arm (2) provided with two ends attached in a pivotable way, around parallel rotation axes, to respective mounting bodies (3, 4), one being fixable to the door (100) and the other to the frame (101) of the vehicle, wherein each mounting body (3, 4) comprises, coinciding with each associated end of the arm (2), a concentric pulley body (5, 6) with a respective rotation axis and fixed to a respective mounting body (3, 4), and the hinge device (1) further comprising linking means (7) that extend along the arm (2) and rest on the pulley grooves (5, 6), being partially rolled up determining two end contact points (51, 52; 61, 62) on the linking means (7) with each of the pulley grooves (5, 6), wherein the arm (2) has an angled shape, having two angled sections (21, 22) configured in a general L shape, in that the path of the linking means (7) comprises a first segment (71) and a second segment (72), the first segment (71) being the one that extends between the first end contact points (51, 61) of the pulley grooves (5, 6) and the second segment (72) being the one that extends between the second end contact points (52, 62) of the pulley grooves (5, 6), and wherein the arm (2) comprises a central diverting element (9) arranged on the bend of the arm (2), the contour surface of which is convex-curved, and where one of its sides is in contact with both the first segment (71) and the second segment (72) of the path of the linking means (7), **characterized in that** the path of the linking means (7) comprises at least one crossing (P1, P2) of segments, wherein the first segment (71) crosses the second segment (72), **in that** the arm (2) comprises, in addition to the central diverting element (9), at least one diverting element (8) arranged on one of its angled sections (21, 22), between the bend of the arm and one of the pulley bodies (5, 6), the contour surface of which is convex-curved, having a diameter smaller than the diameter of any of the pulley bodies (5, 6), and where one of its sides is in contact with the first segment (71) and another one of its sides is in contact with the second segment (72) of the path of the linking means (7), the at least one diverting element (8) being arranged such that the crossing (P1, P2) of segments is located between the diverting element (8) and the pulley body (5, 6) located on the same section (21, 22) of the arm (2) upon which the diverting element is arranged (8), and **in that** the central diverting element (9) arranged on the bend of the arm (2), has a diameter smaller than the diameter of any of the pulley bodies (5, 6).

2. The hinge device (1) according to claim 1, wherein the arm (2) comprises at least two diverting elements (8), each one arranged on one of its angled sections (21, 22), between the

bend of the arm and one of the pulley bodies (5, 6), the contour surface of which is convex-curved and has a diameter smaller than the diameter of any of the pulley bodies (5, 6), each one of the two diverting elements (8) being in contact on one of its sides with the first segment (71) and another one of its sides being in contact with the second segment (72) of the path of the linking means (7), and each diverting element (8) is arranged such that there is a crossing (P1, P2) of segments located between each diverting element (8) and the corresponding pulley body (5, 6) located on the same angled section (21, 22) of the arm (2) upon which the diverting element (8) is arranged.

3. The hinge device (1) according to claim 1 or 2, wherein the first segment (71) and the second segment (72) of the path of the linking means (7) run at different heights at least between a diverting element (8) and the central diverting element (9), such that the contact section of the part of the linking means (7) that follow the first segment (71) with the convex-curved contour surface of the central diverting element (9) is located vertically above or below the contact section of the part of the linking means (7) that follow the second segment (71) with the convex-curved contour surface of the central diverting element (9), the vertical direction being a direction parallel to that of the rotation axes with respect to which the ends of the arm (2) pivot.

4. The hinge device (1) according to any one of the preceding claims, wherein the at least one crossing (P1, P2) between the first segment (71) and the second segment (72) of the path of the linking means (7) occurs at a different height, one segment being located at a height that is different than that of the other, being considered a height measured according to a direction parallel to that of the rotation axes with respect to which the ends of the arm (2) pivot.

5. The hinge device (1) according to claims 3 and 4, wherein the convex-curved contour surfaces of the central diverting element (9) and of the diverting element or elements (8) are provided with perimeter slots for guiding the contact of the linking means (7) with said surfaces.

6. The hinge device (1) according to claim 5, wherein the pulley grooves (5, 6) comprise two perimeter portions located at different heights around the respective pulley body (5, 6), or they are configured according to a helical path around the respective pulley body (5, 6) for guiding the contact of the linking means (7) with the pulley grooves (5, 6).

7. The hinge device (1) according to any one of the claims 2 to 6, wherein the central diverting element (9) is formed by a prismatic body with an elliptical base, with the ability to

rotate around an axis parallel to the rotation axes with respect to which the ends of the arm (2) pivot, said axis of the central diverting element (9) being firmly attached to the arm (2), and being locked in a specific rotation position wherein the linking means (7) adopt a state of tension upon contact with the central diverting element (9).

8. The hinge device (1) according to any one of the preceding claims, wherein the linking means (7) comprise at least one belt (73, 74) or at least one filiform element.

9. The hinge device (1) according to claim 8, wherein the linking means (7) comprise two belts (73, 74) and wherein one belt (73) follows the path of the first segment (71) and the other belt (74) follows the path of the second segment (72).

10. The hinge device (1) according to claim 9, wherein the first ends and the second ends of each belt (73, 74) are fixed in a removable way and respectively to the pulley grooves of the first pulley (5) and the second pulley (6).

11. The hinge device (1) according to claim 9 or 10, wherein the two belts (73, 74) of the linking means have the same length.

12. The hinge device (1) according to any one of the claims 8 to 11, wherein the or each belt (73, 74) of the linking means (7) is flat and is made up of a sheath (75) that contains a plurality of cords (70) arranged in parallel and formed by intertwined filiform elements.

13. The hinge device (1) according to any one of the preceding claims, wherein the mounting body (3) that may be fixed to the door (100) houses in its interior a motor with a rotation axis that causes the arm (2) to rotate.