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(54) **Hinging system for doors or the like**

(57) The pins (6) of the door panel (4) are mounted in receptacles (7) of bushes (9) mounted on a rod (12) to which they are connected through a hole (13) and a projecting lug (15) that are kept into engagement by a

spring (16).

The bushes can be displaced transversally with respect to the rod, by overcoming the force of the spring (16) in order to disengage the lug from the hole and enabling the bush (9) to slide longitudinally.

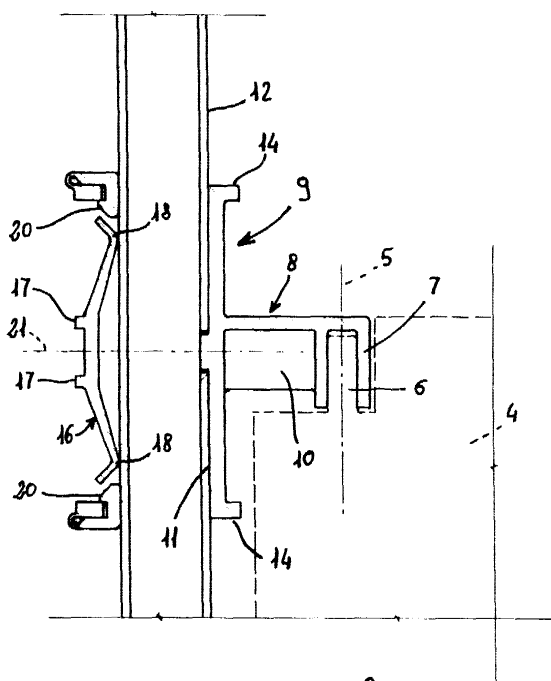


Fig. 2

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Description

[0001] The present invention refers to a hinging system for a door, or the like, particularly, although not solely formed by a panel for closing an aperture provided in the bodywork of a vehicle.

[0002] A number of hinging systems of the above cited kind are known in the art, all of which generally call for the various component parts associated therewith to be fastened by means of screws, rivets, welds and the like, so as to ensure adequate strength and robustness to resist the considerable mechanical stresses which a vehicle, such as for instance a car, is expected to be subject to.

[0003] It would on the contrary be desirable for the main component parts of the whole hinging system, including the door panel, to be capable of being quickly mounted during assembly, as well as easily disassembled in view of possibly required repair and/or replacement operations.

[0004] It therefore is a purpose of the present invention to provide a hinging system for doors or the like, which offers adequate strength to withstand mechanical stresses and, at the same time, enables the main component parts thereof to be conveniently assembled and disassembled.

[0005] According to the present invention, these aims are reached in a hinging system for doors or the like embodying the characteristics as recited in the appended claims.

[0006] The features and advantages of the present invention will anyway be more readily and clearly understood from the description that is given below by way of non-limiting example with reference to the accompanying drawings, in which

- Figure 1 is a schematical, partially cross-sectional front view of a preferred embodiment of the hinging system according to the present invention;
- Figures 2 and 3 are cross-sectional, enlarged-scale views of a detail of the hinging system shown in Figure 1, in respective operating conditions thereof.

[0007] With reference to the Figures, the hinging system according to the present invention is adapted to hinge a door 4 (shown with dashed lines in the Figures) about an axis 5 defined by pins 6, which are aligned with and preferably opposing each other. The pins 6 may be integral with or anyway firmly joined to the door 4 and, in any case, each one of them is rotatably mounted in a corresponding support accommodation comprising a respective bush-like receptacle 7.

[0008] The door 4 comprises preferably a panel for closing an aperture (not shown) provided in the bodywork of a vehicle, such as a car, but it will of course be appreciated that it may also be a door adapted to be mounted on kitchen or similar furniture cabinets.

[0009] Each receptacle 7 is provided at the free end portion of a flange 8 that departs and extends transversally from the centre line of a respective bush 9.

[0010] In a preferred manner, the flange 8 comprises at least a reinforcing rib 10 that is provided integrally with the bush 9.

[0011] The bush 9 has a longitudinal through-hole 11 by means of which it is capable of being mounted on a corresponding support rod 12, which may be square, rectangular, cylindrical or variously shaped in its cross-sectional contour, and which shall be intended as being attached to a fixed support body (such as the bodywork of a vehicle in the described example) in a substantially per se known and not illustrated manner.

[0012] Anyway, the longitudinal through-hole 11 of the bush 9 has cross-section that substantially corresponds to the one of the support rod 12. The latter, which may be either rectilinear or slightly curved, comprises at least a locking hole 13 for each bush 9; the holes 13 may be variously spaced along the same rod, according to the different needs. Furthermore, the longitudinal through-hole 11 of each bush 9 is such that the same bush is mounted on the rod 12 in a slack manner, at least in the direction of the main axis 21 of the above cited locking holes 13.

[0013] Each bush 9 is preferably delimited by two mutually opposing shoulders 14, while at least a protruding lug 15, adapted to get inserted in a corresponding locking hole 13 of the rod 12, departs from the inner surface thereof and extends inwards.

[0014] Each bush 9 further comprises elastic spacer means, which preferably comprise a leaf spring 16 that is oriented longitudinally with respect to the rod 12 and is arranged in a position opposing the lug 15. The spring 16 may be provided integrally with the bush 9, to which it is anyway connected through ribs 17, and the free end portions 18 thereof are normally capable of abutting against the rod 12.

[0015] From the above cited shoulders 14 of each bush 9, preferably in a position that is substantially aligned with the spring 16, there are departing, via flexible connections 19, respective appendices, each one of which comprises a snap-on clasp tooth 20.

[0016] Each bush 20 is normally fixed in position as illustrated in Figure 2, with the respective lug 15 that is held inserted in the associated locking hole 13 thanks to the transversal tensile, ie. pulling force exerted by the leaf spring 16. Furthermore, in correspondence of the shoulders 14, the clearance or play existing between the rod 12 and the longitudinal through-hole 11 of the bush is compensated for by snap-fitting the teeth 20 thereinto.

[0017] The door 4 turns therefore out to be hinged on in position in a safe, reliable and precise manner, and the position thereof can be conveniently adjusted longitudinally, in correspondence of the various locking holes 13 provided in the rod 12.

[0018] With reference to Figure 3, any displacement and/or disassembly of the door 4, as it may for instance

be required to repair or replacement purposes, can be carried out quickly, in a particularly convenient, safe and easy manner. It is in fact sufficient for the teeth 20 to be released from the locking position shown in Figure 2, so as to restore the play existing between the rod 12 and the bush 9. The bush itself can then be pressed by hand, preferably in correspondence of the middle portion of the leaf spring 16, so as to displace the bush transversally, in the direction of the axis 21, in order to cause the lug 15 to slide out of the respective locking hole 13. Such a transverse displacement takes obviously place by overcoming the elastic force of the leaf spring 16.

[0019] At least one of the bushes 9 can therefore be caused to slide at will along the rod 12, thereby releasing the pins 6 from their engagement with the corresponding receptacles 7 and, as a result, enabling the door 4 to be removed, wherein the whole operation can be advantageously performed without any need for any component part whatsoever to be removed from the hinging system.

[0020] Re-assembling the door 4 is then carried out by simply bringing the bushes 9 near to each other in a longitudinal position so as to confine and trap the pins 6 between the respective receptacles 7. The bushes 9 are locked automatically in position by the action of the force exerted by the spring 16, which sets back into the position shown in Figure 2 as soon as the lug 15 comes to lie in correspondence of one of the holes 13, in which it then gets inserted in the afore described manner.

[0021] The bushes 9 can then be definitively locked, as shown in Figures 1 and 2, by snapping on again the clasp appendices 20.

[0022] It will of course be appreciated that the above described hinging system, which requires just a small number of simple component parts of a modular type, may be the subject of a number of further modifications or variants without departing from the scope of the present invention.

[0023] So, for instance, the pins 6 may be positioned in a different manner, for example centrally, and be provided from a common rod.

[0024] Furthermore, one of the pins 6 may be integral with or firmly joined to the rod 12, on which there may be provided a single releasable bush 9.

[0025] It shall further be appreciated that the described hole-lug coupling for locking the bushes 9 in place can be of a reciprocal type, in that the hole 13 can be provided in the bushes and the lug 15 can in turn be provided on the rod 12.

it is adapted to be firmly locked by means of a coupling comprising at least a hole (13) and a protruding lug (15), said bush (9) further comprising elastic spacer means (16) adapted to normally keep said lug (15) into engagement with the associated hole (13), said bush (9) being further adapted to be displaced transversally with respect to the support rod (12), by overcoming the force of said elastic spacer means (16), so as to disengage said lug from the corresponding hole and so enable the bush (9) to slide along the support rod (12) in order to axially release said pins (6) from the respective support receptacles (7).

2. Hinging system according to claim 1, **characterized in that** at least one of said support receptacles (7) is provided in correspondence of a flange (8) that departs transversally from a respective bush (9).
3. Hinging system according to claim 2, **characterized in that** said flange (8) comprises at least a reinforcement rib (10) and is provided integrally with said bush (9).
4. Hinging system according to claim 1, **characterized in that** said elastic spacer means comprise a spring (10) that on a side (17) thereof is fixed to the bush (9) and on the other side (18) thereof is adapted to abut against the support rod (12).
5. Hinging system according to claim 1, **characterized in that** from said bush (9), which has a longitudinal hole (11) by means of which it is mounted loosely on the rod (12), there are departing via flexible connections (19) respective appendices, each one of which comprises a tooth (20) adapted to snap-fit into the clearance existing between the rod (12) and the longitudinal hole (11) of the bush (9).

Claims

1. System for hinging a door, or the like, by means of at least two pins that are aligned along an axis and mounted in corresponding support receptacles, **characterized in that** at least one of said support receptacles (7) is firmly joined to a bush (9) that is mounted loosely on a support rod (12), on to which

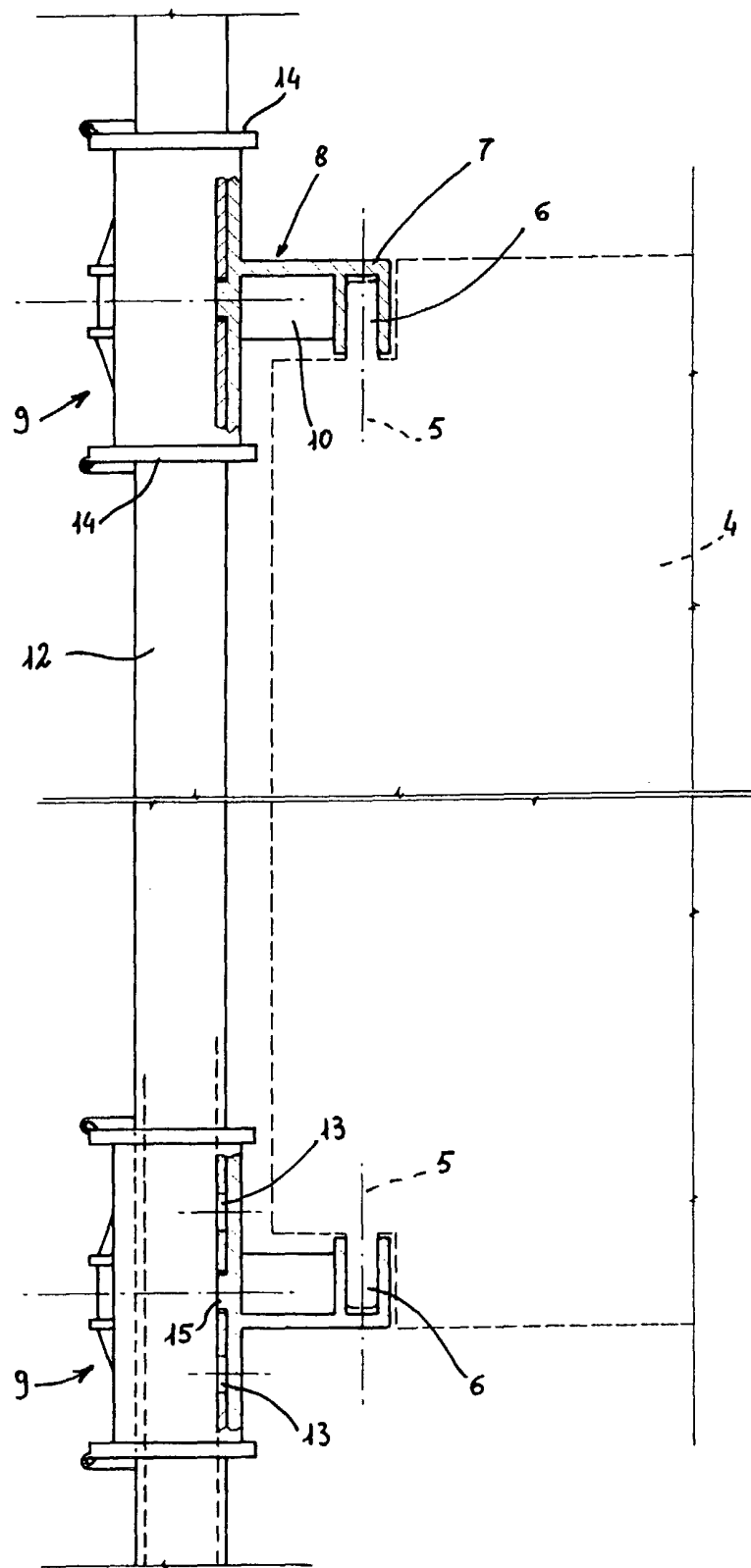


Fig. 1

