

CONVERTIBLE VEHICLE

[0001] The invention pertains to a convertible vehicle according to the introductory clause of claim 1 and to a pickup vehicle according to the introductory clause of claim 12.

[0002] It is known from DE 199 30 616 C1 that a convertible vehicle with a two-part, solid roof can be designed so that the roof parts can be telescoped into each other and stowed away. The rear roof part, which includes the rear window, can be pivoted around a circular path and stowed after it has been rotated about 90° from the vertical around an axis transverse to the vehicle. The pivoting movement is followed by downward movement of the rear roof part together with the forward roof part, which is parallel to it, along guide links, one of which is assigned to each outside surface of the car body. A stowing mechanism of this type takes up a considerable amount of space in the longitudinal direction of the vehicle, which limits the design possibilities for the vehicle.

[0003] In addition, a second drive element for actuating the joint connecting the two roof parts must be provided to telescope the rear roof part and forward roof part into each other, and a third drive element must be provided to slide the forward roof part along a slide rail of the rear roof part. One phase of this movement must be completed before the next can begin. Considerable effort is required to control the process, and a considerable amount of work is also involved in installing the various drive elements required.

[0004] The invention is based on the problem of optimizing a convertible vehicle of the type described above with respect to the amount of space occupied by the roof both when it is stowed and when it is in motion and also with respect to the simplicity of the opening and closing movements.

[0005] The invention solves this problem by means of a convertible vehicle with the features of claim 1 and by a pickup vehicle with the features of claim 12. With respect to advantageous embodiments, reference is made to the dependent claims 2-11.

[0006] The control effort is significantly reduced by a design with only a single drive element per vehicle side, which acts both on the rear roof part and also on the roof part in front. The opening or closing movement of the roof can be carried out by actuation of a single, shared drive element, without the need for any additional control elements, over the course of a single, continuous sequence of movements.

[0007] The possibility of stowing the roof in an especially space-saving manner is obtained by providing a multi-bar linkage, by means of which the rear roof part can be moved simply by the mutual pivoting of the connecting rods connected to each other in the multi-bar linkage.

[0008] The overall movement of the rear roof part thus consists of various individual pivoting movements superimposed on each other, there being no need for a translational component outside the drive element. Especially advantageous although not mandatory is the design of a multi-bar linkage according to claim 2 with only one drive element according to claim 1. Via the multi-bar linkage, therefore, the drive element can divide the overall pivoting movement into the individual pivoting movements of the individual

connecting rods, and thus divided into components, the roof opening or closing process takes the form of a continuous flow of movements.

[0009] If the connection between the rear roof part and the roof part in front of it is also designed as a multi-bar linkage, a measure which is especially advantageous, it is possible for the forward roof part to be stowed by a pure pivoting movement also. It is possible in particular here for the two multi-bar linkages to be connected to each other to form a common multi-joint linkage, so that the movements of the rear roof part and of the forward roof part can be coupled together simply by the multi-bar linkages, without any need for additional control means, etc.

[0010] By selection of appropriate dimensions for the various connecting rods in the multi-joint linkage, the rear roof part can be stowed in such a way that it is pivoted only slightly and thus remains, even after stowing, in the nearly upright position which it occupies when the roof is closed and in which it extends only slightly in the longitudinal direction, i.e., in the direction of travel.

[0011] By means of the invention, it is also possible to make use of very narrow stowing spaces, so that, for example, a pickup truck can also be designed as a convertible, and the roof parts can be stowed in the narrow space in front of the forward end of the open cargo space.

[0012] Additional advantages and features of the invention can be derived from the following exemplary embodiment of the object of the invention, which is described below and illustrated in the drawing:

[0013] FIG. 1a shows a perspective view, from the front, of a convertible vehicle according to the invention, which is designed as a pickup truck, with the roof open;

[0014] FIG. 1b shows the vehicle according to FIG. 1 with the roof closed;

[0015] FIG. 2 shows a section of the vehicle corresponding essentially to area II in FIG. 1b, with the roof closed;

[0016] FIG. 3 shows a perspective view, looking at an angle from the left rear, of the roof area of the vehicle according to FIG. 2;

[0017] FIG. 4 shows a view looking in direction IV of FIG. 3 of the roof and its drive mechanism in the closed position according to FIG. 2;

[0018] FIG. 5 shows a view similar to that of FIG. 2 with the roof closed but with the canopy box cover already open;

[0019] FIG. 6 shows a view similar to that of FIG. 5 while the roof is being opened, where the two roof parts are being moved both relative to each other and also relative to the body of the vehicle;

[0020] FIG. 7 shows a perspective view looking at an angle from the left rear of the vehicle with the roof open, approximately as shown in FIG. 6;

[0021] FIG. 8 shows a view looking in the direction of arrow VIII in FIG. 7 at the roof as it is being opened;

[0022] FIG. 9 shows a view similar to that of FIG. 6 as the roof continues to be opened;