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Self-erecting shelter for motor vehicles in general.

The self-erecting shelter for motor vehicles in general comprising a base frame (2) which defines guides (3) for the movement of the wheels of a vehicle. A main arc element (10) is associated at the entry end of the base frame and can be arranged in an erected position, in which it is placed substantially at right angles to the plane defined by the base frame, and in a collapsed position, in which it overlaps the base frame. Means, comprising a transverse roller (20) engageable by the vehicle front wheels as it enters the shelter and connected to chains (21) for driving a reduction unit (24) connected to the arc element (10), are furthermore provided for the movement of the main arc by the translatory motion of the vehicle on the base frame. An awning (15) is connected to the main arc and is coupled at least laterally to the base frame.
The present invention relates to a self-erecting shelter for motor vehicles in general.

As is known, prefabricated garages for motor vehicles have long been commercially available; in a typical embodiment, they are in practice defined by means of walls made of metal panels which can be assembled together so as to form the garage. These types of shelters have the advantage that they are relatively simple to manufacture, but have the disadvantage of being considered as fixed installations, so that it is necessary to apply for the related permits to the competent authorities in order to install them where required.

Other kinds of solutions, constituted by arc-like elements which are fixed to the ground and support awnings which in practice define the side walls, have failed to prove to be sufficiently safe, since they do not have a structure suitable to withstand the impact of wind, so that such shelters can be pulled down in case of relatively strong wind.

Another problem which is typical of all the above mentioned solutions is constituted by the fact that they are relatively complicated and heavy structures which require relatively long times for their installation and consequently cannot be easily transferred from one place to another.

The aim of the present invention is indeed to eliminate the problems described above by providing a self-erecting shelter for motor vehicles in general which can be used without requiring fixed installation on the ground but by simply resting it thereon.

Within the scope of the above aim, a particular object of the invention is to provide a shelter which is self-erecting, i.e. assumes its shape when it is used, i.e. when the vehicle is inserted, and which furthermore, when the vehicle is not present, assumes in practice a collapsed configuration, i.e. does not have upright surfaces which can be subjected to the impact of wind.

Another object of the present invention is to provide a shelter which is extremely compact and light and consequently can be transported to the various points of use without any problem and is furthermore extremely practical and safe.

Not least object of the present invention is to provide a shelter which can be easily obtained starting from commonly commercially available elements and materials and is furthermore competitive from a merely economical point of view.

This aim, the objects mentioned and others which will become apparent hereinafter are achieved by a self-erecting shelter for motor vehicles in general, according to the invention, characterized in that it comprises a base frame which defines guides for the movement of the wheels of a vehicle, a main arc being associated at the entry end of said base frame, said main arc being arran-

ggeable in an erected position, in which it is arranged substantially at right angles to the plane defined by said base frame, and in a collapsed position, in which it overlaps said base frame, means being furthermore provided for the movement of said main arc, said movement means being actuated by the translatory motion of the vehicle on said base frame, an awning being connected to said main arc and being coupled at least laterally to said base frame.

Further characteristics and advantages of the present invention will become apparent from the following detailed description of some preferred but not exclusive embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

- Figure 1 is a schematic perspective view of a first embodiment of the self-erecting shelter according to the invention, in erected position;
- Figure 2 is a detail view of the entry end of the shelter, shown schematically in erected position;
- Figure 3 is a schematic lateral elevation view of the shelter according to the invention in collapsed position;
- Figure 4 is a view of the shelter during the entry of the motor vehicle, with consequent erection of the shelter;
- Figure 5 is a schematic lateral elevation view of the shelter in erected position;
- Figure 6 is a schematic view of the shelter, taken from one end, with the vehicle inserted therein; and
- Figure 7 is a schematic lateral elevation view of a second embodiment of the self-erecting shelter according to the invention.

With reference to the above figures, the self-erecting shelter for motor vehicles in general, according to the invention, which is generally designated by the reference numeral 1, comprises a base frame 2 which rests on the ground and defines, inside it, a pair of guides 3 for the passage of the wheels 4 of a motor vehicle, generally designated by the reference numeral 5.

The guides 3 are spaced so that they can adapt to the wheel base of all normally commercially available vehicles.

The base frame is furthermore provided with a pair of side members 7, and a passage area 6 is defined to the side of at least one of the guides 3 in order to allow the driver to enter and exit from the motor vehicle.

A main arc element 10 is provided at the base frame, and more precisely at the entry end; said arc can have any shape and is hinged to the side members at the free ends of its arms, so that it can assume an erected position, in which it is substantially at right angles to the plane defined by the base frame, and a collapsed position, in which it
overlaps said base frame.

Intermediate arc elements, designated by the reference numeral 11, are furthermore hinged to the side members 7 and support, in cooperation with the main arc 10, an awning 15 which is advantageously anchored to the base frame at the side members and at the end of the base frame which is opposite to the entry end.

With this arrangement, in the erected position the awning is supported by the central portion of the various arcs and consequently defines an enclosed space which surrounds the motor vehicle.

In order to perform complete closure, closure flaps, designated by the reference numeral 16, are advantageously provided and are connected to the uprights 10a of the main arc 10 and in practice define a closure door for said shelter.

An important feature of the self-erecting shelter according to the invention is constituted by the fact that means are provided for moving the main arc, i.e. for transferring it from the erected position to the collapsed position and/or vice versa, and are actuated directly by the translatory motion of the vehicle on the base frame.

A transverse roller 20 is provided for this purpose; said roller extends transversely to the extension of the guides 3 and is supported, at its ends, by chains 21 which are rotatably supported inside the members 7 and wind around a free transmission roller 22 and around a drive roller 23 which is connected to a reduction unit 24 whose output shaft is fixed to the end of the main arc.

The translatory motion of the chains, caused by the advancement of the motor vehicle on the base frame, thus causes a consequent rotation of the main arc, moving it from the collapsed position (figure 3) to a raised position (figure 4).

As the translatory motion of the vehicle on the base frame continues, the complete erection of the main arc is achieved and said arc arranges itself substantially at right angles to the base frame.

Advantageously, a stop element 30 for the front wheel of the vehicle is provided on the guides 3; said element is arranged in the position which corresponds to the attainment of the erected position for the main arc.

Advantageously but not necessarily, there is a rounded ridge-like element 31 over which the wheel 4 passes before engaging against the stop element, thus providing in practice a seat for accommodating the wheel of the vehicle in the required position.

The ridge-like element thus prevents the vehicle from accidentally leaving from the base frame by gravity.

During the erection of the main arc, the intermediate arcs are gradually raised, since it is the awning itself which, by being pulled by the main arc, in practice raises in succession the intermediate arcs until it reaches the final position.

The intermediate arcs, in their final position, are advantageously inclined toward the end of the base frame which is opposite to the entry end, so as to automatically obtain the collapse of the arcs when the motor vehicle leaves the base frame.

In fact, as the motor vehicle progressively moves outward, the intermediate arcs arranged toward the inner end of the base frame, and then all the subsequent arcs, rotate downward.

During exit, the chains in practice unwind in the opposite direction and consequently allow the rotation of the main arc, too, in the collapse direction.

It is possible but not strictly necessary to provide elastic return means 60 for the intermediate arcs arranged inward, so as to allow their immediate collapse when the vehicle exits.

With the described arrangement, the shelter according to the invention is in erected position only when the vehicle is contained inside it, so a shelter stabilization element is present inside the shelter itself, which cannot therefore move even if it is affected by the impact of a strong wind, whereas when the vehicle is outside the shelter said shelter is automatically in collapsed position.

That is to say, in practice, the shelter passes to the erected position, when the vehicle is inserted therein, and into the collapsed position when the vehicle exits.

Another important aspect to be stressed is constituted by the fact that the shelter, as described above, does not require a fixed installation, i.e. does not need to be anchored to the ground, since the vehicle present inside it acts as a stabilization element, whereas if the vehicle is not present inside it stabilization is not required, since the shelter is in collapsed position.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept.

Furthermore, as can be seen in figure 7, in order to avoid excessive tensioning of the awning during the closing thereof, hinge connections 11b can be provided on the intermediate arc elements 11a thereby to allow a refolding, without tension, in a direction away from the upper portions of the intermediate arc elements. A connecting bar 11c, hinged to the intermediate arc elements 11a and to the main arc element 10, is also provided so as to provide stability and uniform movement.

All the details may furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, as well as the contingent shapes and dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those refer-
ence signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Self-erecting shelter (1) for motor vehicles in general, characterized in that it comprises a base frame (2) which defines guides (3) for the advancement of the wheels (4) of a vehicle (5), a main arc (10) being associated at the entry end of said base frame, said main arc being arrangeable in an erected position, in which it is arranged substantially at right angles to the plane defined by said base frame, and in a collapsed position, in which it overlaps said base frame, means (20-24) being furthermore provided for the movement of said main arc, said means being actuated by the translatory motion of the vehicle on said base frame, an awning (15) being connected to said main arc and being coupled at least laterally to said base frame.

2. Shelter according to claim 1, characterized in that said base frame has side members (7) to which said main arc is pivoted.

3. Shelter according to the preceding claims, characterized in that it comprises a plurality of intermediate arcs (11;11a) which are pivoted to said members and are connected to said awning.

4. Shelter according to one or more of the preceding claims, characterized in that said means for moving said main arc comprise at least one transverse roller (20) which extends transversely to said guides and can be engaged by the wheels of a vehicle, said roller being connected to chains (21) which extend continuously and act on reduction units (24) which are connected to the ends of said main arc.

5. Shelter, according to one or more of the preceding claims, characterized in that said chains are accommodated in said members and wind around a free pinion (22), which is arranged at the end opposite to the entry end of said base frame, and around a drive pinion (23) which is operatively associated with said reduction unit.

6. Shelter according to one or more of the preceding claims, characterized in that it comprises, on said guides, a stop element (30) which can be engaged by the wheel of the vehicle in order to define the position which must be assumed by the vehicle in order to arrange said main arc in erected position.

7. Shelter according to one or more of the preceding claims, characterized in that it comprises, in said guides, a rounded ridge-like element (31) which is spaced from said stop element and is suitable to define, in cooperation with said stop element, a seat for the retention of the wheel of the vehicle.

8. Shelter according to one or more of the preceding claims, characterized in that when said main arc is in erected position said intermediate arcs are inclined toward the end of the base frame which is opposite to the entry end, for the collapse of said arcs in succession upon the exit of the vehicle from the base frame.

9. Shelter according to one or more of the preceding claims, characterized in that it comprises flaps (16) which are associated with said awning and are connected to the uprights of said main arc in order to define a door for the closure of said shelter.

10. Shelter according to one or more of the preceding claims, characterized in that it comprises hinge connections (11b) provided at median positions of said intermediate arc elements (11a), and a connecting bar (11c) pivot to said principal arc element and said intermediate arc elements for the contemporary rotation of said principle arc element and said intermediate arc elements.
## DOCUMENTS CONSIDERED TO BE RELEVANT

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**TECHNICAL FIELDS SEARCHED (Int. Cl.)**

E04H

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The present search report has been drawn up for all claims.

**Place of search**: THE HAGUE

**Date of completion of the search**: 18 MAY 1993

**Examiner**: BARBAS A.

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**CATEGORY OF CITED DOCUMENTS**

- **T**: theory or principle underlying the invention
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- **D**: document cited in the application
- **I**: document cited for other reasons
- **&**: member of the same patent family, corresponding document