

Outdoor Convertible Parking Protection Equipment

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Abstract- Outdoor convertible parking protection equipment for vehicles (100) comprising multiple base columns (1), the base column (1) is mounted on a rigid support (13) with multiple anchor bolts (6) which provides detachable attachments to remove the equipment without damage; upper arm (2) and lower arm (3) are secured to the extended plates (2C,3C) of base column (1) forming a hinge joint (2A,3A) between them; a roof (9) composed of metal or nonmetal sheet is fastened with the upper arms (2) to provide protection to the vehicle below from environmental condition; front links (4) having front bracing members (4A) are secured in between upper (2) and lower arms (3) with the hinge joints (2B,3B); a gas filled pneumatic cylinder (5) mounted between upper arm (2) and base column (1) minimizes the human efforts in lifting the equipment. The locking arrangement including hole (7A) is also provided on the extended end of lower arm (3) in which a pin (7B) is inserted to lock the position of the equipment in horizontal and vertical position.

Keywords- Convertible, Safety, Pneumatic Cylinder, 3D Modeling, Ansys

1. INTRODUCTION

The present invention provides an outdoor convertible parking protection equipment for vehicles having upper and lower link connected with front cage formed by joining cross links providing rigidity between front members of the structure. The base of the equipment is fixed with the wall or column by using fasteners for enabling the user to remove the entire setup when not necessary. The base and links are connected with each other by using a hinge attachment consisting a bush with hole joined with the links and plate with hole joined with the base, a bolt having head with greater in size than the hole is inserted inside the holes and a locking i.e., nut is provided on the other end of bolt which restricts the bolt from falling out of the holes. A gas filled pneumatic cylinder of which top mounting point is connected with the upper link and bottom mounting point is connected with the base of the equipment is generally used for minimizing the user efforts. While lowering the equipment the gas filled inside the pneumatic cylinder gets compressed and similarly while lifting the equipment the gas filled inside the pneumatic cylinder has tendency to expand, this minimizes the human effort while lifting the equipment and converting the equipment in compact mode. Stoppers are provided near hinge point of lower link to limit the motion of links and pin hole is provided on the extended end of the lower link to lock the position after actuation by simply inserting a pin inside the pinhole. The roof top composed of sheet material is fastened in between the upper links by using rivets or self-drilling screws, the roof top restricts harsh sunlight and provides rain protection to the vehicles.

2. LITRATURE REVIEW

Keertana Daliparthy and Laxmana Rapol: In their paper describe current parking planning practices are inefficient and often ineffective at solving parking problems. Minimum parking requirements tend to be excessive because they are generally based on demand surveys performed in automobile-dependent locations, and so require more parking than needed in areas with good travel options, accessible land use, or transportation and parking management programs. Yet this overabundance of supply does not eliminate parking problems because spaces are often unavailable for priority uses or are difficult to access. The real problem is not inadequate supply, it is inefficient management. [1]

S D Prashanth, Suneeth Sathyanathan, Vaishak N Makam, Nagarathna N: In their paper they describe a parking lot management system is used for managing the parking spaces for vehicles in parking lots. An efficient parking management system is the one that allows easier management of parking spaces in parking lots. There are mainly two actors involved in the scene: the visitor, who is driving the vehicle and the parking official, who manages the parking lot. Thus, an efficient parking management system makes the job of both the vehicle parkers and the parking management officials easier. [2]

3. BACKGROUND OF INVENTION:

Because of road traffic and increase in population, protected outdoor space for vehicle parking also comes forth. Many of the inventions and equipment's are available to protect the vehicle from theft and environmental conditions like harsh sunlight, heavy rainfall, etc. According to the prior inventions, vehicle protection equipment was developed which consists of foldable attachments and cloth covering through it which provides protection for vehicles

from environmental conditions. It consists of attachments which are supposed to be fixed with bumpers of vehicles.

In other invention, considering space saving nature of vehicle parking equipment many of the parking equipment's consists hydraulic attachments carrying base which gets elevated with hydraulic cylinders. This type of parking equipment requires sturdy foundations and clear elevation area in which vehicles are further elevated. Cost of such parking equipment's containing vehicle lifting arrangement is high because of using hydraulic cylinders and hydraulic pump; also, it requires regular maintenance for clean working. As lifting of vehicle is carried out, it has weight limitation for the vehicle which is supposed to be parked.

As discussed in the prior inventions, they are consisting of attachments which are supposed to be fixed with vehicle bumpers and this type of structure are not sturdy enough to protect the vehicle from blind impact, also as discussed in hydraulic lifter parking arrangement, it provides better protection to vehicles but due to weight limitations and high manufacturing cost generally it is not supposed to be used. Effectively there exists a need to improve the outdoor parking protection equipment consisting sturdy links, low cost and easily convertible and serviceable attachments.

4. OBJECTIVE OF THE INVENTION:

Principle object of the present invention is to provide safe and space saving outdoor parking for vehicles by using outdoor parking protection equipment.

Another object of the present invention is to make it convertible and compact or space saving by using linking members or hinge joints.

Further object of the present invention is to minimize the human effort by introducing pneumatic cylinders while opening it and folding it after use.

5. BRIEF DESCRIPTION OF THE DRAWINGS:

DRAWINGS:

The objects and advantages of the present invention will become apparent when the disclosure is read in conjunction with the following figures, wherein

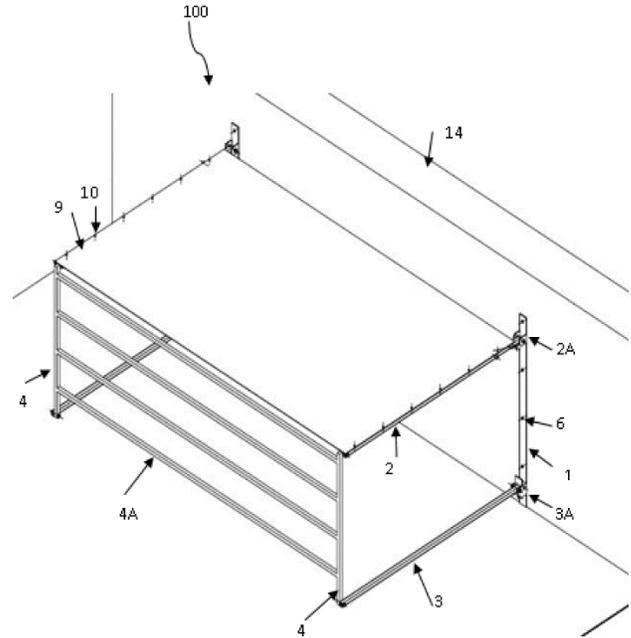


Figure 1

Figure 1 shows a perspective view of outdoor parking protection equipment for vehicles in accordance with the present invention;

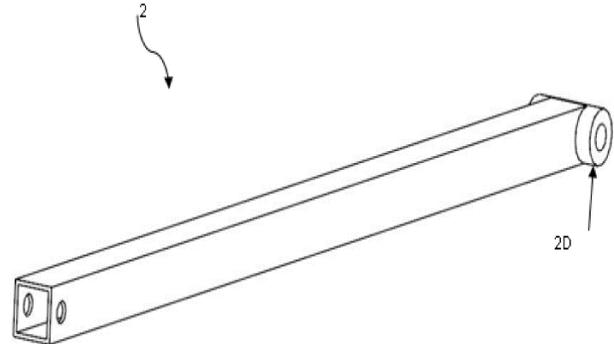


Figure 2

Figure 2 shows a perspective view of upper link of outdoor parking protection equipment for vehicles in accordance with the present invention;

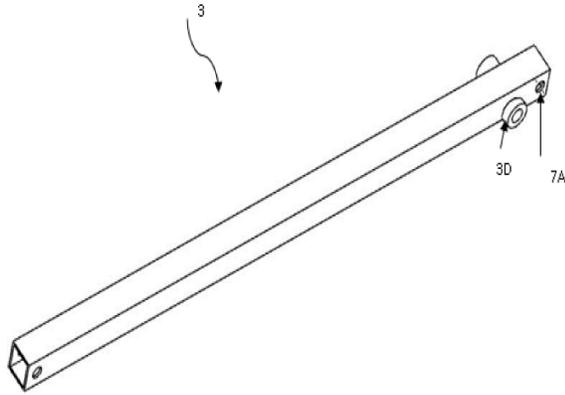


Figure 3

Figure 3 shows a perspective view of lower link of outdoor parking protection equipment for vehicles in accordance with the present invention;

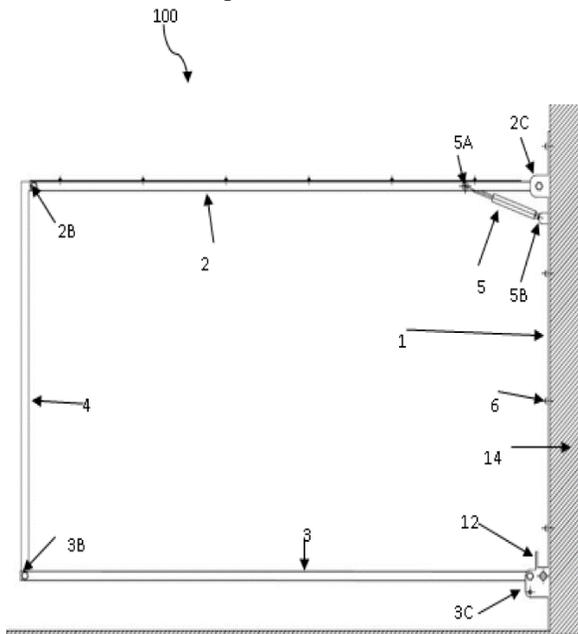


Figure 4

Figure 4 shows side view of outdoor parking protection equipment for vehicles in accordance with the present invention;

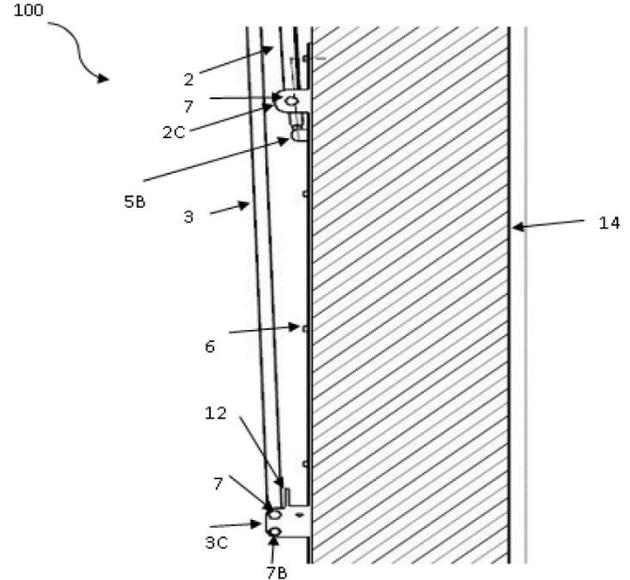


Figure 5

Figure 5 shows side view of outdoor parking protection equipment for vehicles in lifted position in accordance with the present invention;

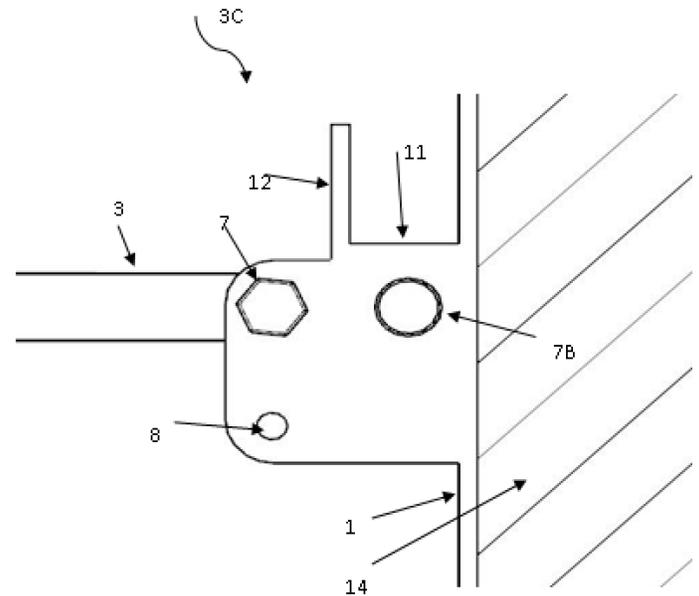


Figure 6

Figure 6 shows side view of lower hinge plate of outdoor parking protection equipment for vehicles in accordance with the present invention;

6. DETAILED DESCRIPTION OF THE EMBODIMENTS:

The present invention is illustrated with reference to the accompanying drawings, wherein numbers indicated in the bracket represent the components of the invention throughout the description. The

components of the invention and the reference numbers are listed in the table below:

Ref. No.	Component Name	Ref. No.	Component Name
1	Base column	5	Pneumatic cylinder
2	Upper arms	5A	Upper mounting point
2A	Upper hinge point	5B	Lower mounting point
2B	Upper front hinge point	6	Anchor bolts
2C	Upper hinge plate	7	Bolt
2D	Bush	7A	Locking hole on lower link
3	Lower arms		
3A	Lower hinge point	7B	Pin
		8	Locking hole
3B	Lower front hinge point	9	Roof top
3C	Lower hinge plate	10	Rivets
3D	Bush	11	Horizontal stopper
4	Front links	12	Vertical stopper
4A	Cross bracing members	13	Concrete wall or column

along the wall to free up space. This equipment give protection as well as shade to the vehicle from direct sunlight or rain.

As the land in metropolitan cities and other higher order cities becoming scarce and dearer and plots getting smaller conventional parking is proving infeasible. Another solution for the parking requirements is the outdoor convertible parking protection equipment.

REFERENCES:

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7. ADVANTAGES:

The advantages offered by this patent is given as follows:

- Outdoor convertible parking protection equipment for vehicles (100) provides outdoor protection for vehicles from harsh sunlight and heavy rain.
- It is convertible and compact in nature and thus saves space when vehicle is not parked, or same space can be utilized for different application.
- As gas filled pneumatic cylinders are used in present invention, it minimizes Human efforts while lifting the equipment.
- The total arrangement of outdoor vehicle parking protection equipment can be removed easily without damaging parts and can be re-assembled quickly, thus it saves damage cost at the time of reinstallation.

8. CONCLUSION:

According to above research we can make convertible parking protection equipment which can be useful when there is less space for making garage or one can save space without making garage. This equipment is convertible therefore it can be folded