This invention relates to an airbag door of a vehicle characterized by having a plate spring 12 located underneath the internal surface of said airbag door 10 which has a restoring force to be rolled up and multiple evenly spaced grooves 14 generated in the lower part of said airbag door 10 so that said airbag door 10 can be rolled up along the groove when said airbag door 10 is deployed thus enabling to prevent the windshield from breakage resulted from a physical contact with an airbag door 10 when said airbag door is deployed upon a vehicle collision.
Fig. 5

Fig. 6
AIRBAG DOOR OF A VEHICLE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention relates to an airbag door of a vehicle which is designed to prevent the breakage of the windshield usually resulted from a direct contact with an airbag door when said airbag door is deployed upon a vehicle collision.

[0003] 2. Description of the Prior Art

[0004] Many vehicles have been provided with airbags as a way to protect passengers as well as drivers from a possible automotive vehicle accident. The conventional airbags, however, have not been considered very advantageous in that the airbag doors which encompass those airbags often damage the windshield of a vehicle when said airbag doors are torn away as the airbags are deployed. One way to prevent the breakage of the windshield 18 is to mount a regulating device 16 to control the angle of airbag deployment on both sides of the airbag door 10 so that angle of deployment can be kept within a certain degree as shown in FIG. 5. Moreover, the central part of an airbag door 10 is cut open so that said airbag door 10 can avoid contacting the windshield 18 thus preventing the breakage of said windshield 18 as shown in FIG. 6. However, the mounting of said regulating device that can control the direction of airbag door in FIG. 5 is very difficult and also those devices are usually unable to tolerate the pressure delivered by the deploying airbag. Moreover, the fact that the conventional airbags in FIG. 6 are deployed as the airbag doors are torn open in the center endanger that the direction of the airbag deployment may not be directed toward a passenger when there is a vehicle collision.

SUMMARY OF THE INVENTION

[0005] Therefore, the object of this invention is to provide an airbag door of a vehicle characterized by having a dual safety mechanism comprising 1) a plate spring beneath the internal surface of said airbag door with a restoring force to be rolled up and also 2) multiple evenly spaced grooves formed in the lower part of said airbag door so that said airbag door can be rolled up along the grooves when said airbag door is deployed, thus enabling to prevent the windshield from breakage resulted from a direct contact with an airbag door when said airbag door is deployed due to a vehicle collision.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 shows an airbag door of a vehicle installed according to this invention.

[0007] FIG. 2 shows a cross-sectional view of a deployed airbag door of a vehicle installed according to this invention.

[0008] FIG. 3 shows a side view of a plate spring mounted inside an airbag door of a vehicle installed according to this invention.

[0009] FIGS. 4, 5 and 6 show a deployed conventional airbag door of a vehicle.

[0100] [Code Explanation of the Major Parts]

[0101] 10: airbag door

[0102] 12: plate spring

[0013] 14: a groove

[0014] 16: a regulating device of deployment angle

[0015] 18: windshield

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] The main object of this invention is to provide an airbag door of a vehicle characterized by having a plate spring 12 inside said airbag door 10 manufactured entirely by means of injection molding and also by having many evenly spaced grooves 14 in the lower part of said airbag door 10.

[0017] The overall scheme of this invention can be delineated in a more clear fashion with reference to the FIGS as set forth hereunder.

[0018] FIG. 1 shows a cross-sectional view of an airbag door of a vehicle. The airbag door 10 is designed to be opened up as an airbag is deployed upon a vehicle collision. Underneath said airbag door 10, there is provided a plate spring 12 manufactured entirely by injection molding as shown in FIG. 3. Said plate spring 12 is the one that has a restoring force to be rolled up, and it is installed so that the direction that it is being rolled and the direction that said airbag door 10 is deployed can be unidirectional. In addition, there are provided many grooves 14 in the lower part of the airbag door 10 which are evenly spaced and also parallel to the east-west direction of a given vehicle frame. Since the airbag door 10 is torn open triggered by a vehicle collision, the airbag door 10 is rolled up being forced by the restoring force of the plate spring 12, and the airbag door 10 is being rolled up via a multiple sequential bending action with its bending activity centered on the grooves 14 formed in the lower part of said airbag door 10. Because the airbag door 10 is being rolled up to be deployed, the airbag door 10 can avoid contacting the windshield 18 and is thus able to prevent said windshield from breakage which used to occur in vehicles equipped with the conventional airbag doors. Further, said airbag door 10 having only grooves 14 can be also bent in a multiple and sequential fashion even without a plate spring 12. Consequently, this invention presents a novel airbag door of a vehicle which can prevent the usual breakage of a windshield resulted from a vehicle collision by providing a dual safety system which has a plate spring with a restoring force to be rolled up mounted beneath the airbag door thus airbag door can be rolled up instead of being burst open in the case of the conventional airbag doors and also many evenly spaced grooves formed in the lower part of the airbag door can lead the airbag door to an orderly and sustained deployment sufficient to avoid sudden contact with the windshield of a vehicle when there is a vehicle accident.

What is claimed is:

1. An airbag door of a vehicle characterized by having an elastic member placed underneath the internal surface of an airbag door manufactured by injection molding which has a restoring force to be rolled up and also multiple evenly spaced grooves formed in the lower part of said airbag door.

2. The airbag door of a vehicle according to claim 1, wherein said elastic member is a plate spring.