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(54) **Shock buffer for motor vehicles**

(57) Traffic crash absorber for absorbing impact and retarding a vehicle (4) on crashing. It comprises at least one crash impact receiving unit (5) connected to a friction mat (2) with an attachment (3). At a crash the vehicle (4)

is entering the friction mat (2). The vehicle (4) is strongly retarded gradually when pulling the total traffic crash absorber. The vehicle (4) will have an increased friction because it rests on the friction mat (2) and forces it against the ground.

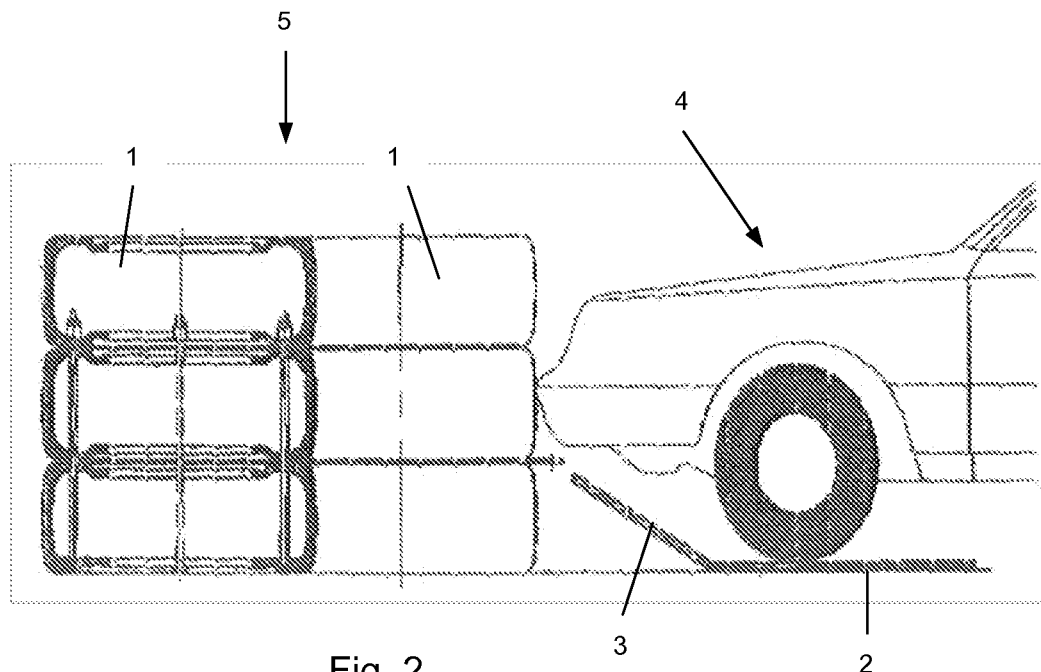


Fig. 2

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Description

[0001] The invention relates to a traffic crash absorber as stated in the introductory part of claim 1. More specifically it relates to a traffic crash absorber for dampening impact and retarding a motor vehicle on a crash, with at least one crash impact receiving unit with elastically and crash absorbing properties.

[0002] Such traffic crash absorbers are used for temporarily arrangement at roads and streets, providing a partition between vehicle tracks and areas for people or protecting against colliding with dangerous objects along the road.

Background

[0003] In connection with road work, both maintenance and construction, it is frequently necessary to change the road lane or track, necessitating the arrangement of traffic crash absorbers to keep the traffic restricted. In case of an accident, if a vehicle leave the intended track, it is crucial to reduce the damage caused.

[0004] Mobile traffic crash absorbers are used both for marking the track and for retarding vehicles leaving the intended track. To reduce the damage, particularly on people, but also on the vehicle, such mobile traffic crash absorbers should have a retarding and damping effect suitable for the traffic.

[0005] SE 502091 describes a mobile traffic crash absorber built of used tires. This absorber has too low weight and is thrown away by an impact. It may be made heavier, but it then will be more difficult to handle, and also damage more seriously the vehicle crashing.

[0006] US 3,848,853 also shows a traffic crash absorber prepared from a stack of used tire, also with insufficient ability to absorb the impact on a crash.

[0007] Both proposals have limited usefulness for bringing safety to people, as the absorber may be thrown away, at the risk of hitting people being situated in the vicinity.

[0008] From WO 99/39054 a traffic crash absorber made of vehicle tires and intended for a race track is known, in which the tires are arranged in tubular rows with the axis in the vehicle direction and stacked in two layers. In front of the tire arrangement, a braking mat is arranged which is covered by gravel or sand. Neither the absorber nor the retarding mat will provide sufficient braking at an impact of a vehicle on a road and the absorber was not intended for being a crash absorber for ordinary roads and streets.

[0009] From WO 2005/054583 a traffic crash absorber is known, wherein vehicle tires are stacked in a horizontal state and wherein multiple stacks are connected in a series. This arrangement will increase the ground friction, particularly if the tires are provided with weights. It is however unsuitable for catching heavy vehicles and/or vehicles at high speed.

[0010] From JP 1085853 A it is known to place a

ground sheet which is under a vehicle and is dragged by this. The braking effect is depending only on the friction between the ground sheet and the ground and this braking is not satisfactory.

5 [0011] From JP 2006-17707 it is known a traffic crash absorber with a rod like absorber which is connected to a ground sheet without statement of the structure.

[0012] It is a problem at prior art traffic crash absorbers, that the impact from a large vehicle in high velocity may throw the complete crash absorber away.

Object

[0013] There is a need for a traffic crash absorber retarding the velocity gradually, without too great impact on the vehicle. This requires the crash absorber to exert a certain resistance, sufficiently to reduce the velocity over a certain distance. On the other hand, the braking should not be too strong to hurt the passengers, and as far as possible not cause damage to property. At the same time it is important that the braking should avoid crash with persons in the protected working or traffic area.

[0014] Temporarily arranged traffic crash absorbers for gradually braking should be easy to move and/or to arrange, but should stand a high impact. Easy moving requires low weight, while on the other side a certain weight is necessary, partly to stand the load, partly to exert the resistance necessary to bring the vehicle to a halt.

30 [0015] The main purpose of the invention of the invention thus is to provide a mobile traffic crash absorber to be used at maintaining and constructing roads and streets, which is not too heavy to handle and which still provides sufficient retarding, to avoid body injury and material damage.

35 [0016] Further it is an object to connect several crash absorbers to a larger entity, to stand higher impacts. It is an aim to provide an absorber which is easy to manufacture and which is based on low cost materials.

40 [0017] It is important to provide a crash absorber having short distance of retarding heavy vehicles at high velocity, and not too high retarding for low weight vehicles, creating to high G-forces.

The Invention

45 [0018] Said objects may be achieved through a traffic crash absorber according to the invention as stated in claim 1. It comprises a traffic crash absorber for absorbing impact and retarding a vehicle on crashing, with at least one crash impact receiving unit with elastically and crash absorbing properties, and with a mat arranged in front of the crash impact receiving unit facing the direction of traffic, for providing friction to the ground and braking effect. The main novelty is that the crash impact receiving unit comprises at least two stacks of vehicle tires which are arranged side by side and that the friction mat comprises a net of iron bars and/or chains.

[0019] The traffic crash absorber thus will have a double function, both as an absorber and as a retarder. As a retarder, the invention will utilize the vehicle as a friction booster and thus provide a friction depending on the weight of the vehicle. The crash absorber unit according to the invention will provide a high absorbing effect, which together with the friction mat will absorb light as well as heavy vehicles better than prior art traffic crash absorbers.

[0020] The stated design of the friction mat allows creating a balance between desirable retarding length and maximum shock damping, to avoid high G-values.

[0021] The claims 2-7 are describing favorable features of the invention. Further details will be given in the following description of examples of the invention.

Examples

[0022]

Figure 1 shows an example of an embodiment of the invention in top view, while

Figure 2 shows the traffic crash absorber of Figure 1, in side view.

[0023] Figure 1 shows a complete traffic crash absorber comprising a crash impact receiving unit 5 and a friction mat 2. Three individual crash absorber 1, each of a stack of used tires, are connected to the larger crash impact receiving unit 5. The friction mat 2 is connected to the crash impact receiving unit 5 with an assembling unit 3, e.g. of chains.

[0024] Figure 2 shows the traffic crash absorber of Figure 1 seen in side view. The crash impact receiving unit 5 is connected to the friction mat 2 with an assembling unit 3, which may be connected to the crash impact receiving unit 5 between the two lowermost tires of the stack 1. Additionally, a vehicle 4 which has entered the friction mat 2 is shown approaching the crash impact receiving unit 5.

[0025] The friction mat 2 is arranged at the edge of the road and is connected to the crash impact receiving unit 5 at the remote end of the friction mat.

[0026] When a vehicle 4 is leaving the road track, or the area provided for its use, it will enter the friction mat 2. After the front wheels having crossed most of the mat 2, the vehicle 4 will hit the crash impact receiving unit 5 which is connected to the end of the friction mat 2. The vehicle will try to move the crash impact receiving unit 5, but this is retained by the friction mat 2 carrying the vehicle through the assembling unit 3. Consequently the vehicle 4 will pull the friction mat 2 and the crash impact receiving unit 5, but now with increased friction to the ground, as the friction mat is pressed into the ground by the weight of the vehicle. 4. This will provide a rapid, but not too rapid retarding of the movement of the vehicle.

[0027] The friction mat 2 may comprise a net of 12 mm reinforcement bars placed on the ground in the area from

the road track towards the crash impact receiving unit. Normal ground will be bitumen.

[0028] The assembling unit 3 may consist of 10 mm chains which is welded to the reinforcement bars of the friction mat 2. To provide hold, the reinforcement bars is inserted into the chain.

[0029] One of the advantages of the invention is the transfer of the vehicle weight to the traffic crash absorber, providing a retarding effect depending on the weight.

[0030] When the traffic crash absorbers according to the invention are arranged for use, the increased weight will be modest and they are easy to handle.

[0031] A further advantage of the invention is that the crash impact receiving unit is not thrown away, which has been normal at prior art absorbers. Now the crash impact receiving units 5 are linked to the friction mat 2 which is squeezed between the vehicle and the ground.

[0032] The traffic crash absorber according to the invention may be used for road work to protect the worker and avoid crash with the construction machines and permanent structures, as bridge pillars.

[0033] The traffic crash absorber according to the invention is suitable for this purpose, as it will serve for telling the road user of the road track and also retard a vehicle when leaving the intended track.

[0034] The traffic crash absorber may be modified in different ways. The individual crash absorber may be based on other materials and having other structures than in the example. The connection of several crash absorbers may also be different from the shown embodiment.

[0035] Correspondingly the friction mat 2 and the assembly unit 3 may have other embodiments. The friction mat 2 may have a chain structure and this may be extended towards the crash impact receiving units for connection.

[0036] A particular advantageous embodiment has three or more stacks of vehicle tires arranged side by side in a row.

[0037] In an alternative embodiment, the friction mat may comprise a net structure of rubber elastic elements. The rubber elastic elements may be sliced vehicle tires, with at least a lower crosswise extending row. Such rubber elastic elements will provide a higher friction to bitumen than a net of only metal.

[0038] Several traffic crash absorbers according to the invention may be linked together in a row with chains and/or wire.

Claims

1. Traffic crash absorber for absorbing impact and retarding a vehicle on crashing, with at least one crash impact receiving unit (5) with elastically and crash absorbing properties, and with a mat (2) arranged in front of the crash impact receiving unit facing the direction of traffic, for providing friction to the ground

and braking effect, **characterized in that** the crash impact receiving unit (5) comprises at least two stacks of vehicle tires (1) which are arranged side by side and that the friction mat (2) comprises a net of iron bars and/or chains.

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2. Traffic crash absorber according to claim 1, **characterized in that** the crash receiving unit comprises three stacks, each with three vehicle tires (1).

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3. Traffic crash absorber according to claim 2, **characterized in that** the crash receiving unit comprises three stacks of vehicle tires which are arranged side by side in a row.

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4. Traffic crash absorber according to claim 2, **characterized in that** the crash receiving unit comprises three stacks of vehicle tires which are arranged in a triangle.

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5. Traffic crash absorber according to claim 1, **characterized in that** the friction mat comprises a net structure also including rubber elastic elements.

6. Traffic crash absorber according to claim 5, **characterized in that** the rubber elastic elements are joined slices of vehicle tire treads, with at least one lower crosswise extending row.

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7. Traffic crash absorber according to claim 6, **characterized in that** the friction mat has an attachment (3) to the crash impact receiving unit (5) vertically in the middle range.

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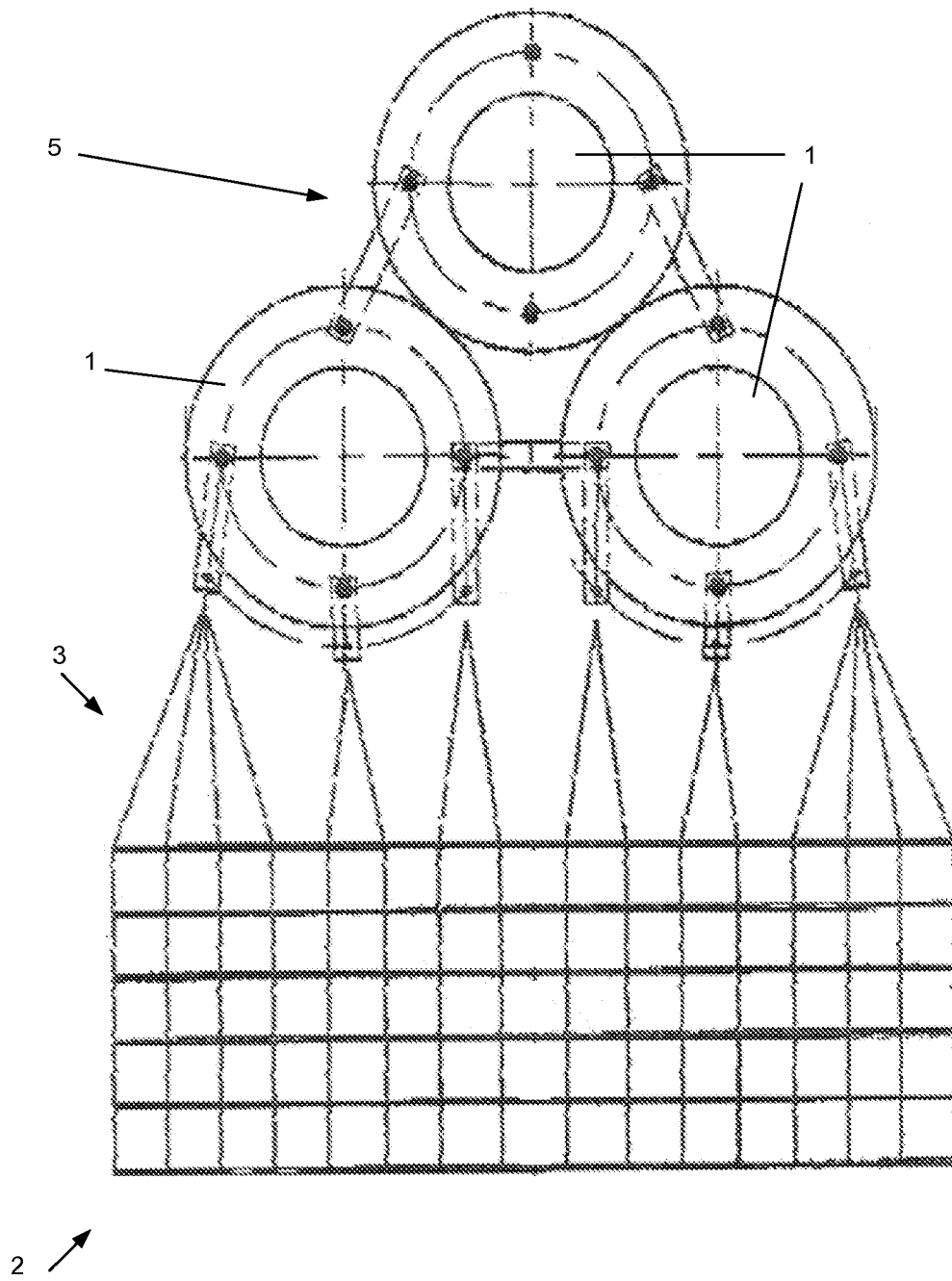


Fig. 1

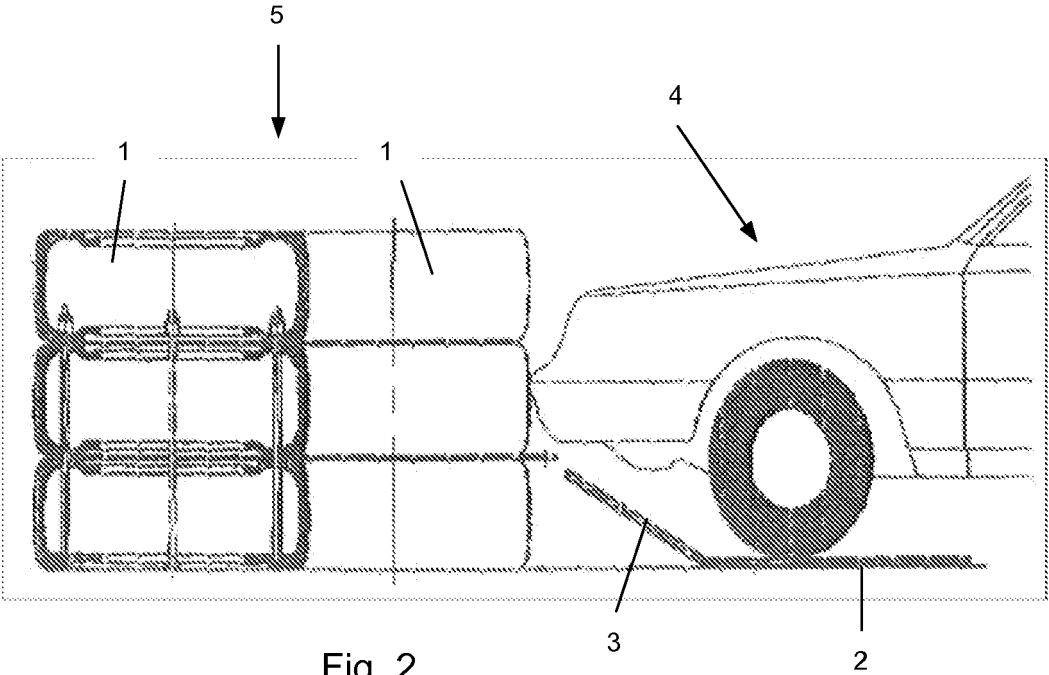


Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- JP 1085853 A [0010]
- JP 2006017707 A [0011]