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GB A 2185949 US 4501386
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B7J
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(54) Load-bearing slat for vehicle luggage carriers

(57) The slat 10 includes an elongated channel member 20 which is fixedly secured to the surface of the vehicle 12 and a rub strip 34 mounted to the channel member which supports the cargo and prevents exposure to the channel member. The channel member includes a perpendicular retaining shoulder 36 disposed inwardly from and forming an extension of the side walls of the channel member 20. These retaining shoulders cooperate with horizontal grooves 48 formed in opposite sides of the rub strip 34 to prevent vertical displacement of the rub strip relative to the top opening of the channel member 20. Thus, the rub strip is fixedly retained within the opening by the perpendicular shoulders.

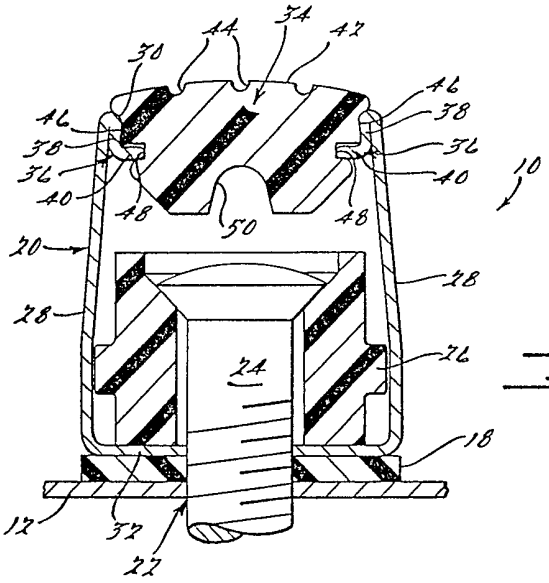

Fig. 2.

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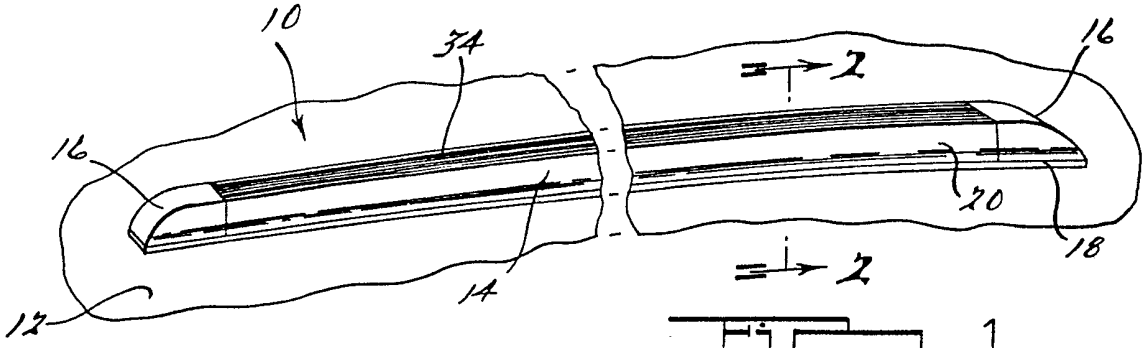

Fig. 1.

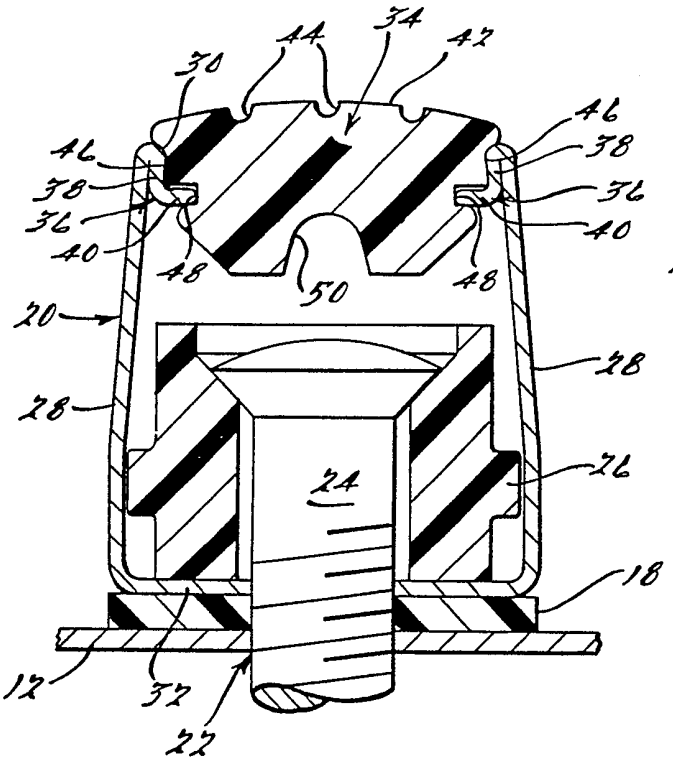

Fig. 2.

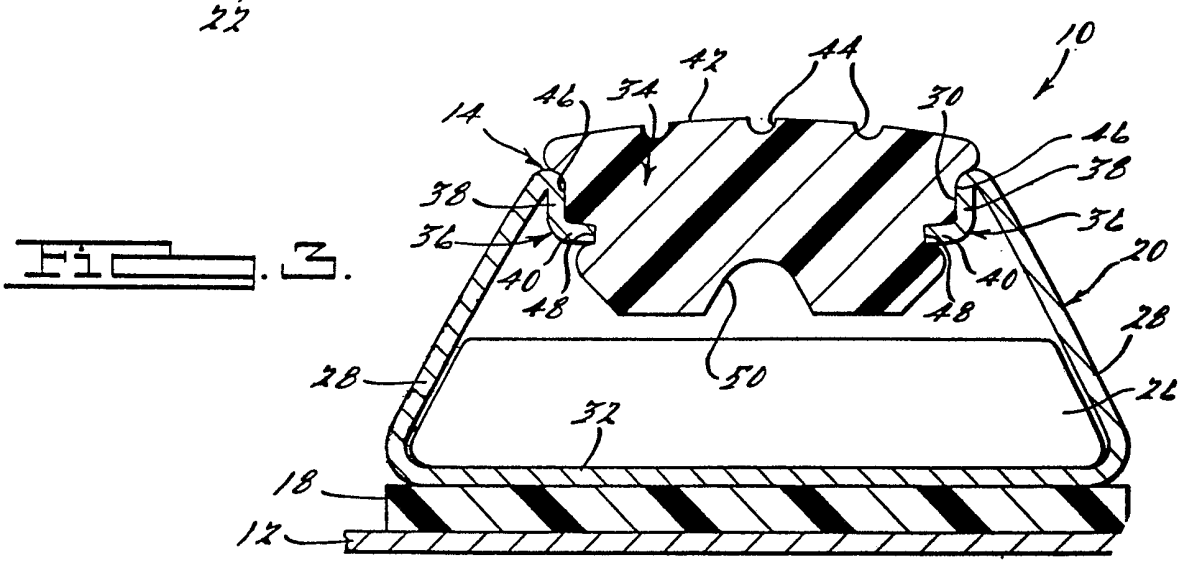

Fig. 3.

SPECIFICATION

Load-bearing slat for vehicle luggage carriers

Background of the invention

Field of the invention

This invention relates to vehicle mounted luggage carriers and, in particular, to a construction for a slat which forms the load-bearing surface of the luggage rack.

Description of the prior art

Longitudinal load-bearing slats have been widely utilized to form the support surface of a vehicle luggage carrier. Generally, these slats are mounted flush with the surface of the vehicle and extend longitudinally to minimize wind resistance. Many of the past known slats are constructed of stainless steel and secured to the vehicle by a series of mounting screws. However, it has been found that the full stainless steel construction can cause damage to luggage and the like from the frictional rubbing between the slat and cargo. In addition, movement of the luggage can cause damage to the slat itself.

In order to overcome this, a rub strip was added to the stainless steel slat to protect the cargo from damage. This rub strip is generally made of a rubber or plastic material and is mounted to the top of the slat. In a known embodiment, the stainless steel slat is formed by a channel member having an elongated opening on its top face. This channel member is secured to the vehicle surface by mounting screws disposed within the channel member. Once mounted, the rub strip is placed within the top opening of the channel member to form the load-bearing surface of the luggage carrier. However, in order to facilitate assembly of the slat, the rub strip has a substantially wedge-shaped cross section which interacts with a downwardly angled extension of the side walls of the channel member to maintain the position of the rub strip in the opening of the channel member. In this position, an upper surface of the rub strip extends above the channel member.

Despite the ease of assembly provided by the wedge-shaped rub strip and the inwardly angled walls of the channel member, the rub strip has a tendency to be pushed down inside the channel member under heavy loads. Thus, when heavier luggage is placed upon the slats, the load can expose the top surface of the stainless steel channel member to the luggage causing damage to both the luggage and the support slat. Moreover, under extreme loads portions of the rub strip may be pushed completely within the channel member requiring removal of the entire strip or specialized tools for removal of the vertically displaced portion.

Summary of the present invention

The present invention overcomes the disadvantages of the prior known load-bearing slats by providing a slat construction which eliminates the vertical displacement of the rub strip relative to the channel member.

The slat according to the present invention includes an elongated channel member mounted to an exterior surface of the vehicle and to which is mounted an elongated rub strip which is fixedly retained within the channel member. The channel member is preferably constructed of stainless steel and includes opposing side walls which define a top opening of the channel member. Retaining shoulders which form an extension of these side walls are disposed inwardly from the walls. These retaining shoulders are formed by two perpendicular portions, one of which extends downwardly from the top of the side wall and the other of which extends horizontally inwardly from the first portion. Thus, these two portions form a perpendicular retaining shoulder regardless of the overall shape of the channel member.

The rubber or plastic rub strip, which is mounted within the top opening of the channel member, includes a wedge-shaped lower portion and vertical side walls extending upwardly from the lower portion. The tapered lower portion of the strip facilitates assembly of the strip within the channel. Formed in the side walls of the strip are horizontal grooves which extend substantially the length of the strip and cooperatingly engage the inwardly extending portion of the retaining shoulder. The interaction of the inwardly extending flanges with the horizontal grooves positively locks the strip into the channel member. With the rub strip mounted in the top opening of the channel member, the upper portion of the strip extends above the stainless steel channel member to prevent contact between the cargo and the steel channel member.

Thus, the present invention provides a simple and convenient construction for a longitudinal slat of a luggage carrier which is easy to assemble yet is not subject to vertical displacement of the rub strip under heavy loads.

Other objects, features, and advantages of the present invention will be apparent from the following detailed description taken in connection with the accompanying drawings.

Brief description of the drawing

The present invention will be more fully understood by reference to the following detailed description of a preferred embodiment of the present invention when read in conjunction with the accompanying drawing, in which like reference characters refer to like parts throughout the views, and in which:

Figure 1 is an elevated perspective of one of the load-bearing slats embodying the present invention;

Figure 2 is a cross-sectional perspective of a preferred embodiment of the present invention taken along line 2-2 of Figure 1; and

Figure 3 is a cross-sectional perspective of an alternate embodiment of the present invention.

Detailed description of a preferred embodiment of the present invention

Referring first to Figure 1, a load-bearing slat 10 embodying the present invention is thereshown. The slat 10 is adapted to be mounted to the exterior

surface 12 of a motor vehicle in order to form a luggage carrier or rack. The slats 10 which form the luggage rack may be mounted to the rooftop of the vehicle or a rear deck in either a longitudinal or transverse alignment. As with conventional load-bearing slats, the slat 10 of the present invention generally comprises an elongated longitudinal 14 and end caps 16 secured to the ends of the longitudinal 14. In order to protect the surface 12 of the vehicle from premature corrosion, a protector strip 18 is disposed between the slat 10 and the vehicle surface 12.

Referring now to Figures 1 and 2, the longitudinal 14 of the slat 10 includes an elongated channel member 20 mounted to the vehicle surface 12 by securing means 22. In the preferred embodiment, the channel member 20 is secured to the vehicle by a plurality of screws 24 spaced along the channel member 20 and disposed within a support member 26 which enhances the structural strength of the slat 10. An example of such a fastening assembly is disclosed in U.S. Patent No. 4,501,386. Alternatively, the channel member 20 may be secured to the vehicle surface 12 in any manner which provides secure positioning of the slat 10, including rivets or adhesives.

The channel member 20 includes a pair of side walls 28, which define an elongated top opening 30, and a bottom wall 32. Disposed within the top opening 30 is an elongated rub strip 34 which is mounted within the opening 30 to prevent direct contact between the cargo and the metal channel member 20. Preferably, the rub strip 34 is made of rubber or plastic although any material may be utilized which provides the necessary flexibility and strength yet will not damage cargo placed on the slat 10.

Integrally formed with the side walls 28 of the channel member 20 are retaining shoulders 36 which prevent the vertical displacement of the rub strip 34 through the opening 30. These retaining shoulders 36 are disposed inwardly from the side walls 28 and are preferably merely an extension of the side walls 28. Each of the retaining shoulders 36 are formed by a downwardly depending portion 38 disposed inwardly from the wall 20 and a flange portion 40 extending horizontally inwardly from and perpendicular to the downwardly depending portion 38. As has been noted, in the preferred embodiment, the downwardly depending portion 38 and the inwardly extending flange 40 are an extension of the respective side wall 20.

The rub strip 34, which is fixedly retained within the top opening 30 of the channel member 20, has an arched top surface 42 upon which the cargo rests. The top surface 42 includes a plurality of grooves 44 which enhance the frictional engagement between the rub strip 34 and any cargo. Formed in the vertical side walls 46 of the rub strip 34 are opposing horizontal grooves 48 which extend substantially the entire length of the rub strip 34. These grooves 48 are adapted to receive the inwardly extending flanges 40 of the retaining shoulders 36 as will be subsequently described. Finally, the lower portion of the rub strip 34 includes a compression groove 50 which facilitates insertion of the rub strip 34 by permitting compression of the lower portion of the strip 34.

The alternative embodiment of the present invention shown in Figure 3 utilizes substantially the same components. However, a wider channel member 20 is utilized to broaden the support base of the slat 10 such that greater loads can be supported thereon. Thus, the side walls 28 of the channel member 20 have a substantial slope while the bottom wall 32 is significantly wider than the bottom wall of the embodiment shown in Figures 1 and 2. Despite this difference in configuration, the retaining shoulders 36 remain substantially perpendicular to the vehicle surface with the portions 38 extending downwardly from the top of the walls 28 and the flanges 40 extending horizontally inwardly from and perpendicular to the first portions 38. As with the embodiment shown in Figures 1 and 2, the inwardly extending flanges 40 cooperate with the horizontal groove 48 of the rub strip 34 to prevent vertical displacement of the rub strip 34 through the opening 30 of the channel member 20.

Referring now to Figures 2 and 3, the configuration of the rub strip 34 facilitates assembly of the slat 10 while also preventing vertical displacement thereof once assembled. The channel member 20 is first secured to the vehicle surface 12 by the securing means 22. Alignment and access to the securing means 22 is readily accomplished since the top opening 30 of the channel member 20 is exposed. Once proper positioning is accomplished, the rub strip 34 may be mounted within the top opening 30 of the channel member 20. In order to insert the rub strip 34, the strip 34 is first placed on top of the channel member 20 with the lower portion of the rub strip extending partially into the opening 30. Thereafter, the rub strip 34 is forced into the channel member 20 utilizing a mallet or similar tool. As the rub strip 34 is displaced downwardly, the retaining shoulders 36 of the channel member 20 cause the lower portion of the rub strip 34 to compress inwardly about the compression groove 50 until the flanges 40 of the retaining shoulders 36 engage the opposing horizontal grooves 48. In this position, the top surface 42 of the rub strip 34 extends completely across the channel member 20 to prevent any cargo placed on the slat 10 from rubbing against the metal channel member 20.

Thus, the present invention provides a load-bearing slat of a luggage rack which is designed to prevent vertical displacement of the rub strip relative to the channel member even under extreme loads. Because of the horizontal engagement between the retaining shoulders 36 and the grooves 48 of the rub strip 34, the rub strip 34 is locked within the channel member 20.

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should be understood therefrom as some modifications will be obvious to those skilled in the art without departing from the scope of the appended claims.

CLAIMS

1. A load-bearing slat for a surface mounted vehicle luggage carrier, said slat comprising:

an elongated channel member mounted to said vehicle surface, said channel member having a pair of side walls defining a top opening;

an elongated rub strip mounted within said top opening of said channel member; and

means for fixedly retaining said rub strip within said top opening thereby preventing vertical displacement of said rub strip relative to said top opening of said channel member.

2. The slat as defined in claim 1 wherein said side walls include retaining shoulders disposed inwardly from said side walls.

3. The slat as defined in claim 2 wherein said retaining shoulders of said side walls are formed by a downwardly depending portion disposed inwardly from said wall and a flange portion extending horizontally inwardly from said downwardly depending portion.

4. The slat as defined in claim 3 wherein said retaining shoulders are integrally formed with their respective side wall, said downwardly depending portion and said inwardly extending flange forming an extension of said side wall.

5. The slat as defined in claim 2 wherein said rub strip includes opposing horizontal grooves extending substantially the length of said strip, said grooves having a substantially rectangular cross-section.

6. The slat as defined in claim 5 wherein said retaining means comprises said retaining shoulders of said channel member engagingly cooperating with said opposing grooves of said rub strip, said horizontal flange portions extending into said grooves of said rub strip.

7. The slat as defined in claim 2 wherein said rub strip includes an upper portion and a lower portion, said lower portion having a tapered cross-section to facilitate insertion of said rub strip into said channel member and said upper portion extending above said channel member to form the load-bearing surface of said slat.

8. The slat as defined in claim 1 wherein the vertical dimension of the channel member is greater than the horizontal dimension of the channel member.

9. A load-bearing slat for a surface mounted vehicle luggage carrier, said slat comprising:

an elongated channel member mounted to said vehicle surface, said channel member having a pair of side walls defining a top opening and retaining shoulders substantially perpendicular to the vehicle surface integrally formed with and disposed inwardly from said side walls;

an elongated rub strip having an upper portion, a lower portion and vertical side walls extending therebetween, said rub strip mounted within said top opening of said channel member and including opposing horizontal grooves formed in the side walls of said rub strip; and

means for fixedly retaining said rub strip within said top opening thereby preventing vertical displacement of said rub strip relative to said top opening of said channel member, said means comprising the engaging cooperation of said retaining shoulders of said channel member within said opposing grooves of said rub strip.

10. The slat as defined in claim 9 wherein said retaining shoulders of said side walls are formed by a downwardly depending portion disposed inwardly from said wall and a flange portion extending horizontally inwardly from said downwardly depending portion, said flange portion extending perpendicular to said downwardly depending portion.

11. The slat as defined in claim 10 wherein said flange portion of said side walls extends into said groove of said rub strip to fixedly restrain said rub strip.

12. The slat as defined in claim 11 wherein said downwardly depending portions and said inwardly extending flanges form an extension of said side walls of said channel member.

13. A load-bearing slat for a vehicle luggage carrier substantially as hereinbefore described with reference to and as shown in Figures 1 and 2 or Figure 3 of the accompanying drawings.

14. A vehicle luggage carrier including a load-bearing slat as in any preceding claim.

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