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G. O. LORENZ

1,950,316

FOLDABLE LINER FOR FREIGHT CARS

Filed Oct. 20, 1932

Fig. 1.

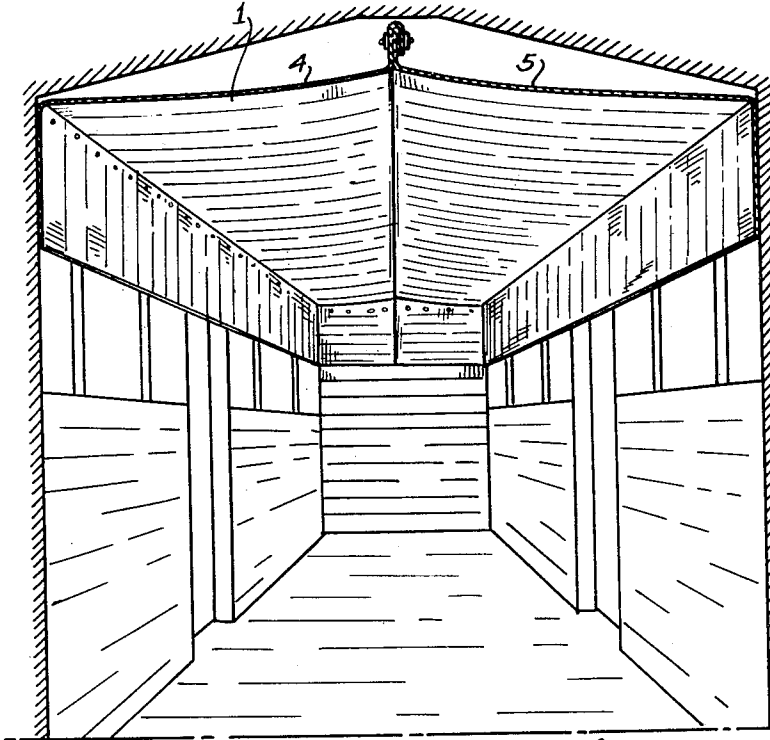


Fig. 2.

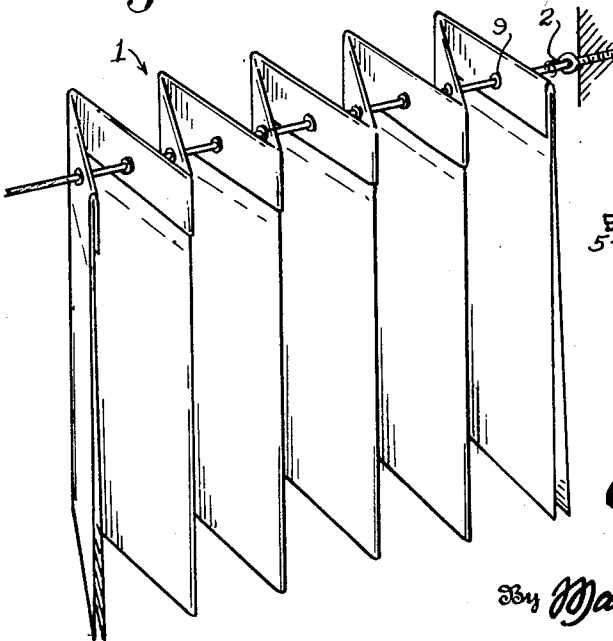


Fig. 3.



Fig. 4.

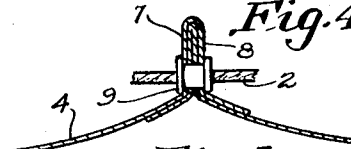


Fig. 5.

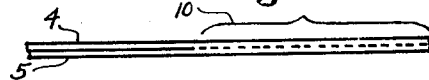
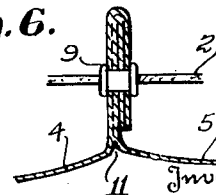


Fig. 6.



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UNITED STATES PATENT OFFICE

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FOLDABLE LINER FOR FREIGHT CARS

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Application October 20, 1932, Serial No. 638,906

2 Claims. (Cl. 105-423)

This invention relates to roof tents or ceiling liners for freight cars designed for the protection of goods shipped in the freight car from leakage of moisture or the sifting of dust through the car roof. The present invention is an improvement of that disclosed in my Patent No. 1,898,195, Feb. 21, 1933.

The invention as disclosed in said patent comprises a flexible sheet preferably of paper either water-proof or semi-water-proof, capable of being folded into a relatively small package prior to use and being adapted to be spread the full length and width of the car ceiling. It is designed to be suspended from a cord longitudinally stretched along the car ceiling from end to end, to be spread widthwise across the car ceiling and with marginal portions extending down the sides and ends of the car and defined by tacking the liner close in to the roof angles.

The object of the invention described in the patent aforementioned was to provide a roof tent or liner in the form of a longitudinally folded sheet disposed in a compact orderly series of folds or accordion pleats, extending alternately in opposite directions and being provided along its longitudinally folded edge with alining grommets, one for each pleat through which, while the sheet is still in compact folded state, the suspension cord may be passed, from which position of suspension the liner may be readily expanded both longitudinally and widthwise without the risk of its being torn during manipulation, and in a manner greatly to facilitate its installation.

The object of the present improvement is to construct a liner embodying the general principles of that disclosed in my aforesaid co-pending application, but so constructed that the weight of the liner itself when expanded, or pulsations of the same through the jolts and vibrations incident to travel, will not tear the liner away at the grommets.

Other objects of the invention will appear as the following description of the preferred and practical embodiments thereof proceeds.

In the drawing:

Figure 1 is a perspective view of the interior of a freight car showing the liner of the present invention in expanded position;

Figure 2 is a perspective view of the same partially folded;

Figure 3 is a detail view showing the manner in which the two sheets forming the liner in my aforesaid patent are pasted together preparatory to being folded and furnished with the grommets;

Figure 4 is a cross sectional view of the prior

form of my invention, illustrating the lateral strains to which it is subjected and through which it is apt to tear out at the heads of the grommets;

Figure 5 is a view similar to that of Figure 3 showing the manner in which the two sheets are pasted together in the present improved construction; and

Figure 6 is a detail view similar to Figure 4 showing the manner in which the pasted zone of the median seam takes the lateral strain away from the region adjacent the grommets.

Referring now in detail to the several figures, the numeral 1 represents the liner, which is a sheet of flexible material preferably a heavy grade of paper. The manner in which it is folded is indicated in Figure 2 as is also the mode of suspending it by passing the suspending cord 2 through the alined grommets 9 and then expanding the liner first longitudinally as indicated in Figure 2 and then widthwise as shown in Figure 1. These features are covered in my aforementioned patent.

Figures 3 and 4 show the mode of constructing the liner in the said patent, the two sheets 4 and 5 having their edges lapped and pasted together along a zone indicated by the bracket 6, the sheets 4 and 5 being extended in opposite directions. The overlapping edges constituting the pasted zone, afford a region of double thickness which is folded double as shown in Figure 4 and the two sides of the fold 7 and 8 united by the grommets 9. When the sheets 4 and 5 are pulled out widthwise into the expanded position shown in Figures 1 and 4, an extraordinary stress is placed upon the material in the region of the grommets due to the fact that the two sides of the fold pull away from each other at an angle, the sides of which rest against the lower portions of the ends of said grommets and tend to tear through. The strain to which the material may be subjected in the region of said grommets may be quite considerable and is augmented by the pulsations and vibrations which the liner suffers incidental to the jolts of the train in motion.

A liner constructed according to the invention disclosed in the said patent is short lived in view of the inherent weakness, as described, in the region of the grommets.

Figure 5 shows how the two sheets 4 and 5 are pasted together in constructing the liner according to the improved invention. The sheets are laid one upon the other and their adjacent edges pasted together along a zone represented by the bracket 10. The sheets extend in the same direction. In forming the median seam for the

grommets, the pasted zone is folded over upon itself as indicated in Figure 6 and the grommets 9 passed through the two sides of the fold. The plane of the pasted surfaces in this instance lies between the sides of the fold and extends to a distance below the region of the grommets as indicated at 11 in Figure 6, so that the strain upon the median seam incident to the widthwise spread of the liner is resisted uniformly along the entire length of the liner by the lower edge of the pasted surfaces, remote from the region of the grommets so that there is no tendency for the grommets to tear through the material. In consequence a liner made according to the principles of the present improvement may be used over and over again without material deterioration.

While I have in the above description disclosed what I believe to be a preferred and practical embodiment of my invention, it is to be understood that the specific details as shown and described are merely by way of example and not to be construed as limiting the scope of the invention as claimed, and that the plural term "sheets" in-

clude also the sides of an integral folded sheet pasted together adjacent the fold and constructed into a liner in the manner described.

What I claim is:

1. Car liner comprising flexible sheets united longitudinally along one of their adjacent edges having an intervening film of paste forming a seam, the free portions of said sheets emanating from the same edge of said seam, and the latter being folded upon itself to increase its thickness, for strength, and grommets passing through the folded portion of said seam remote from the edge from which the free portions of said sheets emanate, for suspending said liner from a cord threaded through said grommets, said sheets adapted to be spread at a point removed from said grommets to prevent tearing.

2. Car liner as claimed in claim 1, the thus constructed member being folded into a series of accordion pleats with the grommets alining when said pleats are laid together.

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