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INSULATED WALL CONSTRUCTION

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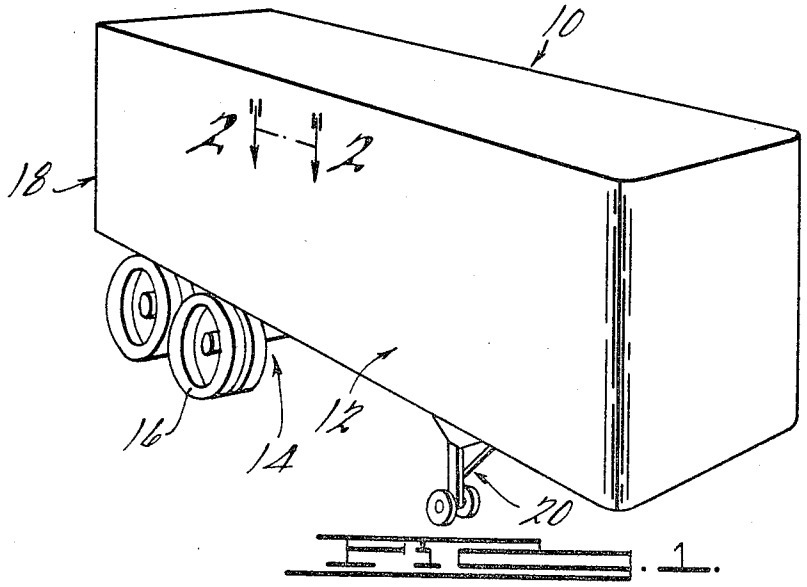


FIG. 1.

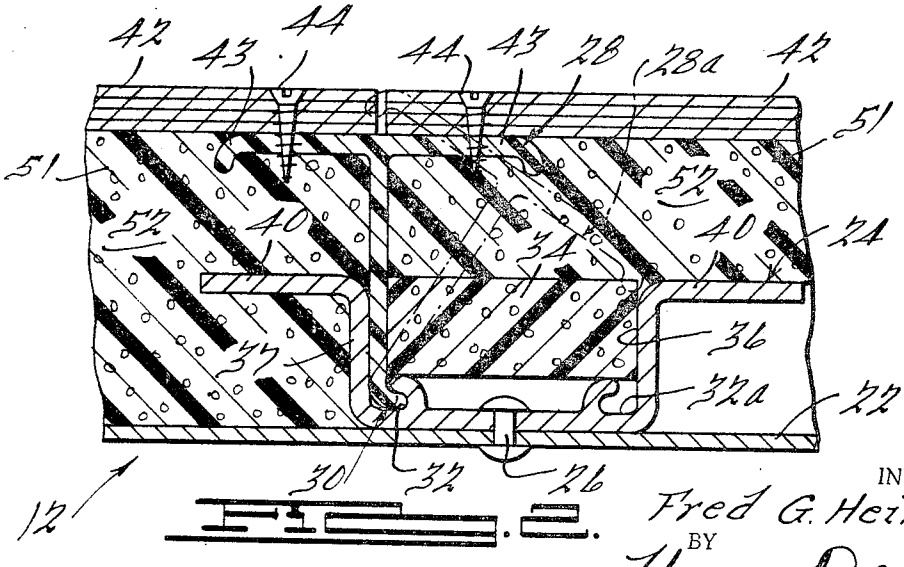


FIG. 2.

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INSULATED WALL CONSTRUCTION

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ABSTRACT OF THE DISCLOSURE

An insulated wall construction for use on semi-trailers, trucks, containers and the like, comprising a metal outer wall, at least one wall post supporting the outer wall, a second inner wall formed of wood partitions, with the wood inner wall being held stationary relative to the outer wall by a T-shaped spacer wherein the leg of the T hooks into connection with the wall post and is held in connection by means of a foam block wedged into the wall post, with the lateral arms of the T being used for supporting connection of the inner wood wall partitions, and a foam insulating material disposed between the inner and outer walls of the construction.

This invention generally relates to an insulated wall construction for use on trailers, trucks, containers and the like, as well as to a method of preparing the insulated wall construction.

In the past insulated wall constructions for use on refrigerated semi-trailers and the like have been known, however, the wall constructions of the prior art have been difficult to construct and they have also been unsatisfactory to a certain extent because the walls allowed an inordinately high amount of heat transfer to take place between the exterior of the semi-trailer which is at a relatively high temperature and the interior of the trailer in a refrigerated condition. The high heat transfer if allowed to take place makes the refrigeration of the interior of the trailer very inefficient, and least one cause of the high heat transfer through the wall section in prior art wall constructions was the fact that spacers, which had to be used in maintaining the inner liner of the wall in fixed position relative to the outer side of the wall, caused excessive heat transfer to take place in contrast with the conventional insulating materials used between the inner liner and the outer side of the wall, which insulating material separates the two at positions other than those occupied by the spacers. Regardless of the amount of heat transfer which takes place the spacers are necessary in order to have a proper wall construction, and in view of this there has long been sought in the art an insulated wall construction which utilizes such spacers in such a manner that the wall construction is easy and economical to manufacture and yet which wall construction is still highly insulating to prevent the transfer of heat from the exterior to the interior of the trailer.

Accordingly, one object of this invention is to provide an improved insulated wall construction.

Another object of the invention is to provide a method of preparing said insulated wall construction which method is practical and economical to carry out.

Another object of the invention is to provide an insulated wall construction which is easily prepared due to the utilization of a generally T-shaped plastic spacer which can be readily pivoted or clipped into position and subsequently attached to an inner wall with means such as screws during the preparation of the overall wall structure without the use of inconvenient means such as nuts and bolts or the like.

Another more specific object of the invention is to provide an insulated wall construction comprising an outer wall and an inner wall generally supported by a wall post and separated by an extruded plastic spacer means which is made of a low heat conducting material, as well as the method of preparing this insulated wall construction.

Other objects, features and advantages of the present invention will become apparent from the subsequent description and the appended claims taken in conjunction with the accompanying drawings, in which:

FIGURE 1 illustrates a conventional highway trailer which incorporates the insulated wall construction of this invention, and;

FIGURE 2 illustrates a cross sectional view taken along the line 2—2 of FIG. 1 to show in detail the construction of the insulated wall construction of this invention which utilizes a generally T-shaped plastic spacer means (shown out of position by dotted lines) to hold the separated and fixed condition the inner and outer panels of the wall.

Broadly stated, the invention comprises an insulated wall construction comprised of an outer wall and an inner wall supported by one or more wall posts and separated by one or more plastic spacer means which can be pivotally inserted into the wall post for connection therewith and then also connected to either the outer or inner wall, preferably the inner wall, to hold the two in fixed apart position, and this thereby forms a void or cavity between the inner and outer walls which is filled with an insulating material such as foam or the like.

In its method aspect, broadly stated, the present invention comprises preparing an improved insulated wall construction by first attaching one or more wall posts to either an outer surface panel or an inner surface panel of the wall and then pivotally connecting a plastic spacer means into engagement with the wall post. The pivotal engaging of the plastic spacer with the wall post is a unique feature of the invention for the reason that this means that no nuts, bolts or the like are needed to join the plastic spacer with the wall post and in addition since the plastic spacer means is made of a very low heat conducting material it does not allow significant heat transfer from the exterior of the wall to the interior when the wall is used in a refrigerated trailer or the like. After the plastic spacer has been pivoted into engagement with the wall post it is attached to the other surface panel of the wall through the use of screws or other conventional connectors and then the void space or cavity between the inner surface panel and the outer surface panel of the wall is filled with a highly heat insulative material, such as for example, foam.

To more specifically describe the invention, FIGURE 1 shows a conventional highway trailer designated **10** which trailer utilizes the insulated wall construction designated **12** in accordance with the invention. The trailer also has a two-axle rear suspension system **14** with eight wheels **16** at the rear of the trailer **18**, which includes a door construction, not shown. The front of the trailer when not connected to a tractor for highway travel is supported on a suspension device **20** which can be raised and lowered as desired.

FIGURE 2 shows the details of the insulated wall construction in cross section view as indicated by the lines 2—2 of FIG. 1. The wall construction as shown in FIGURE 2 is comprised of an outer wall **22** supported by one or more wall posts **24** with the wall post **24** being connected to the outer wall **22** through the use of a bolt **26** or equivalent means. The wall post **24** is made of any strong material capable of supporting the walls, however, from a preferred standpoint one material which has been found especially suitable is extruded aluminum.

The spacer means **28** is shown connected to the wall post

by a curved male portion generally designated **30** on the spacer means which is connected within the recess **32** of the wall post **24** by a pivotal insertion type joining with the wall post. The pivotal type insertion of the generally T-shaped spacer means as shown in FIGURE 2 is illustrated more clearly by the dotted line indication of spacer at **28***a*. From this it is seen that during the construction of the wall the spacer **28** is connected to the wall post by initially joining the curved portion **30** with the recess **32** and then pivoting the spacer about the curved portion to in effect engage the spacer with the wall post. The recess **32***a* is the same as recess **32** except for the difference between right and left hand orientation and may be used for the construction of a wall on the opposite side of the trailer or the like.

Although it is possible to maintain the spacer **28** in position within the recess **32** of the wall post **24** without the use of any additional means from a preferred standpoint it is desired to fixedly hold the spacer within the recess through the use of a block **34**. The block **34** can be made from any number of materials so long as the requirement is met that the material selected be of a low heat conductivity, and it should also be flexible so that it can be easily inserted into the channel **36** to give a tight fit and thereby hold the spacer **28** in a tight position against the side **37** of the channel. Most suitable results have been obtained when the block **34** is made of foam and for this reason it is preferred that a foam block be used. On both sides of the channel **36** attached to the upper side walls **37** thereof are positioned outwardly extending flange members **40** as part of the wall post **24**.

The inner walls **42** of the insulated construction of the invention are connected to the flange portions **43** of the T-shaped spacer through the use of screws **44** or equivalent connecting means. As indicated, the inner walls **42** are thereby held in fixed position relative to the outer wall **22** and in a generally parallel relationship with respect thereto. The inner walls **42** can be made from a number of materials such as for example, plywood or the like. The same holds true for the outer wall **22** which can also be made from any number of materials, however, for purposes of example it is conventional to make the outer wall of a metal, such as for example aluminum.

The spacer **28** is quite important to obtaining the insulated wall construction of the invention. The main requirement for the spacer is that it be made from a material which is a low heat conductor and in this regard it has been generally found suitable to make the spacer from plastic. From a preferred standpoint, with respect to ease of production, proper strength and the like, it has been found most suitable to make the spacer **28** from extruded plastic.

Between the outer wall **22** and the inner wall **42** there is disposed an insulating material **51** within the void space **52** formed between the two walls. The choice of the insulating material should be made such that it is relatively light in weight and has high heat insulating properties. Very suitable results have been obtained when foam is used as the heat insulating material **51** and for this reason it is preferred that foam be used as such insulating material.

The method of preparing the insulated wall construction described above generally comprises the steps of: attaching the wall post to either the inner wall or the outer wall; then pivoting the spacer into engaging connection with the wall post; attaching the other of the two walls **22** and **42** to the flange **43** of the spacer and then filling the void space **52** between the inner and outer wall with a highly insulating material.

The unique feature of the method of constructing the insulator wall is that the spacer can be easily pivotally inserted into position and since it is made from a plastic it is of a very low heat conductivity hence it significantly reduces any heat transfer between the outer wall **22** and the inner wall **42**. In addition the spacer **28** is easy and inexpensive to produce, as well as being light weight, and hence it greatly facilitates the overall construction of the insulated wall.

While it will be apparent that the preferred embodiments of the invention disclosed are well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change.

What is claimed is:

1. An insulated wall construction for use on trailers, trucks, containers and the like comprising:

a first outer wall,

at least one wall post fixed to and providing support for said outer wall said post being generally channel shaped in cross section and including at least one integral rib in the channel defining a female recess adjacent the intersection of the web and flanges forming the channel,

a second inner wall held stationary and spaced relative to said outer wall,

elongated spacer means fixedly positioning said inner wall in spaced relation to said outer wall, said means being made of a material which is a low heat condutcor, and said means being joined along one edge thereof with said wall post by pivoting said spacer means into said female recess in said wall post, said recess generally extending the length of said post, and

insulating material generally completely filling the space between said inner wall and said outer wall, said spacer means being generally T-shaped and said edge including a curved portion seated in the similarly shaped female recess and

wedge means disposed within said channel clamping said spacer means in engaging connection within the channel and recess of the wall post.

2. The construction of claim **1** wherein:

said wall post is attached to said outer wall,

said wedge means is an insulating member comprised of a foam block, and

said insulating material is comprised of a foam material.

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52—425, 481, 588, 741