United States Patent

[11] **3,581,675**

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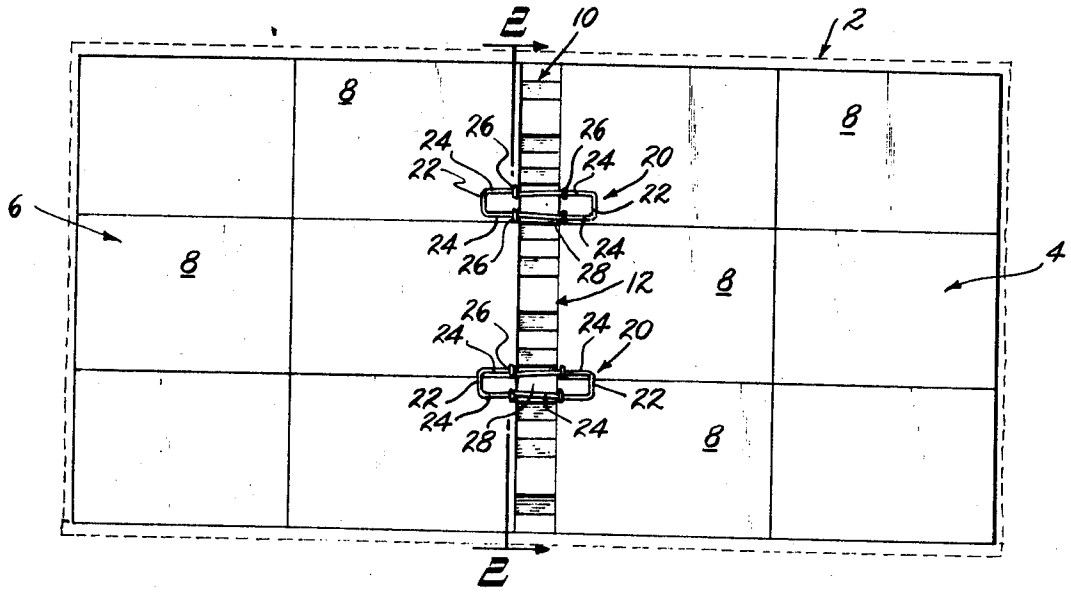
[54] **COLLAPSIBLE LOAD SPACER SUPPORT**
4 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **105/369,** 105/367
[51] **Int. Cl.** **B61d 45/00**
[50] **Field of Search** 105/367, 369; 52/615; 16/87.2; 248/489, 323

[56] **References Cited**
UNITED STATES PATENTS
3,405,659 10/1968 Hees 105/369

Primary Examiner—Drayton E. Hoffman
Attorney—Bacon and Thomas

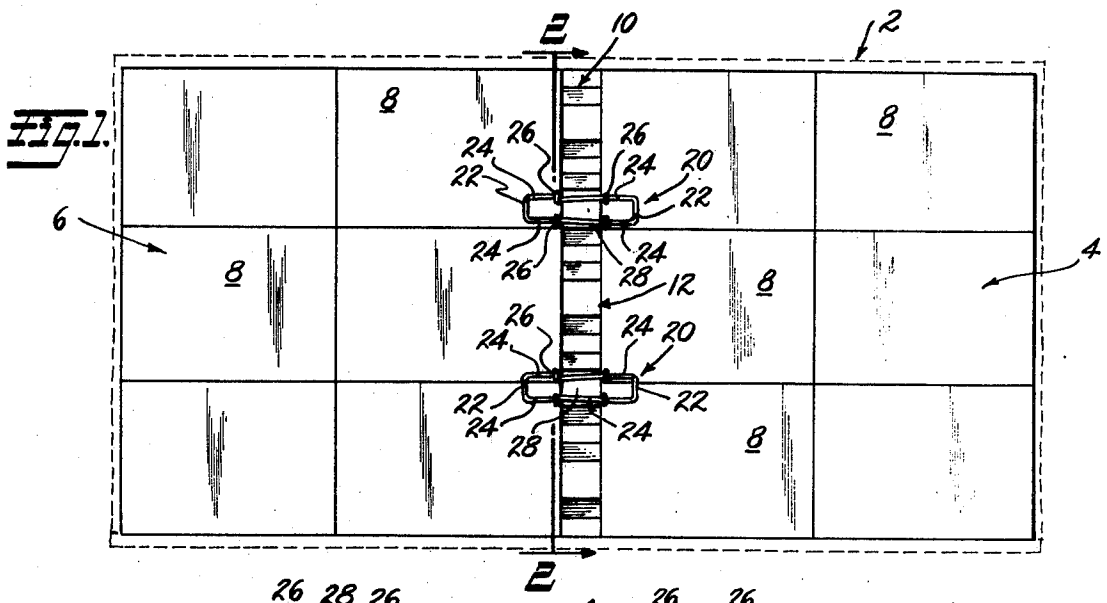
ABSTRACT: A support formed of wire bent to define an elongated loop having overlapping and relatively slidable side portions releasably secured together and adapted to be assembled in embracing relation to the cell walls of an expandable honeycomb load spacer to suspend the same between a load of articles and an adjacent surface.



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Fig. 1.



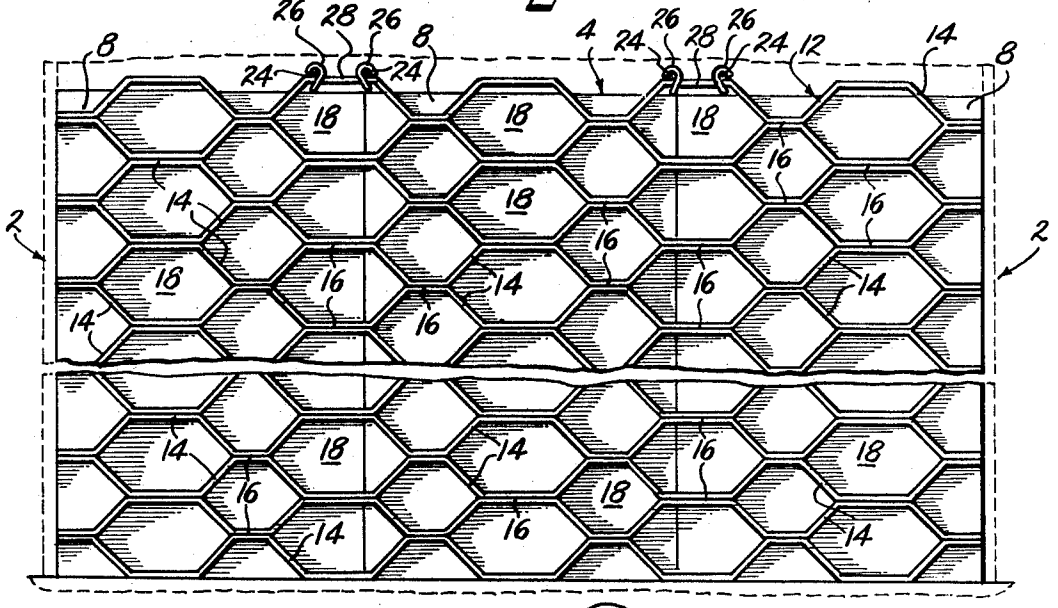


Fig. 2.

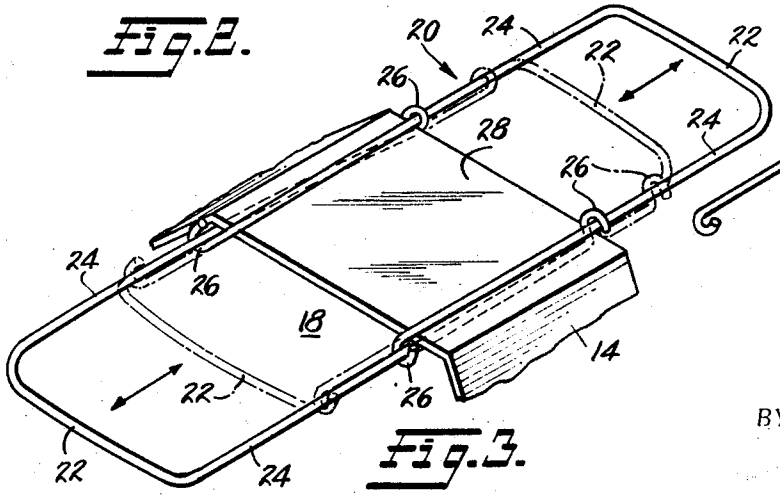


Fig. 3.

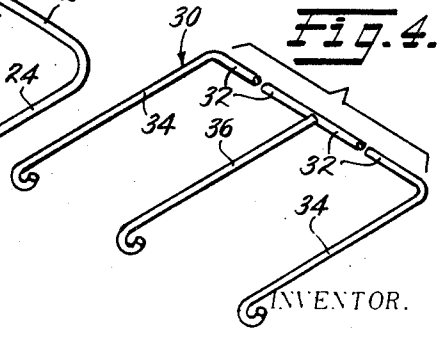


Fig. 4.

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COLLAPSIBLE LOAD SPACER SUPPORT

CROSS REFERENCE TO RELATED APPLICATIONS

This invention is an improvement on the invention disclosed in the copending application of Ronald D. Hees, Ser. No. 747,988, filed July 26, 1968, and in the patent to Hees, 3,405,659, issued Oct. 15, 1968.

BACKGROUND OF THE INVENTION

This invention relates to load spacers for filling void spaces between articles of freight, and particularly to means for suspending such spacers in place.

Suspended load spacers of the type contemplated here are fully described in the copending application and the patent noted above. In the copending application, however, the means for suspending the expandable honeycomb structure between stacks of articles employs an elongated base member secured to the top sheet of the honeycomb structure when the latter is in a collapsed condition. When the spacer is put in place and permitted to expand vertically downwardly, it necessarily follows that the individual cells of this structure must contract horizontally. However, the elongated base member to which the suspending means are attached prevented horizontal contraction and vertical expansion of the upper cells of the structure and thus some of the material of the spacer was, in effect, wasted. The structure disclosed in the patent referred to involved the provision of means for use with horizontally expandable load spacers for engaging the sides of adjacent stacks of articles and contemplated the provision of a sheet material adhered to the honeycomb structure to extend laterally therefrom and engage the sides of the stacks of articles.

SUMMARY OF THE INVENTION

The present invention comprises a separably means for holding expandable honeycomb structures either in suspended position between stacks of freight articles or in horizontally extended position between the same and comprises adjustable and separable means engageable selectively with individual cells of the honeycomb structure, whereby no restraint is placed on expansion of the cells in any direction and the holding means are reusable and separately storable.

In general, a pair of generally U-shaped wire structures are provided arranged with their legs extending toward each other in overlapped relation and the free end of each leg being provided with a means for releasably and slidably connecting it to an intermediate portion of the leg it overlaps. Thus, the structures may be inserted from opposite sides of a honeycomb structure and have their leg ends then engaged and can be telescopically extended so that the engaging means abut opposite sides of the honeycomb structure to prevent shifting and to provide support for the expanded spacer, whether the same is expanded in a vertical or horizontal direction.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a freight container having stacks of articles therein with one form of the present invention shown in place;

FIG. 2 is an enlarged elevational view taken on the section line 2–2 of FIG. 1;

FIG. 3 is an enlarged perspective view of one of the load spacer supports shown assembled to an expandable honeycomb structure; and

FIG. 4 is a perspective view of an alternative form of spacer support.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIG. 1, numeral 2 indicates the sidewalls of a freight container, which may be a railway freight car, truck body, or the like. In the container are positioned stacks 4 and 6 of discrete articles 8 of freight. The stacks do not completely fill the container 2 but define therebetween a

generally planar space 10. An expandable honeycomb structure 12 is positioned in that space with the sheet material thereof extending transversely across the space into abutment with the adjacent faces of the stacks 4 and 6, thus preventing undue shifting of the load of articles during transportation of the container 2. The expandable honeycomb structure 12 is of well-known form, comprising strips 14 of corrugated paper board, stacked in superimposed relation and adhered to adjacent strips at staggered and spaced positions 16 so that when the stack is expanded, it forms a multiplicity of individual cells 18 in a well-known manner. It is often desirable to arrange the honeycomb structure between the stacks of articles so that it can expand downwardly therebetween under the influence of gravity. This permits the spacer structure to be automatically self-adjusting for the heights of the stacks of articles. However, it is necessary to support the upper edge of the spacer in some manner.

As shown, support means 20 are provided, a preferred form of which is shown in greater detail in FIG. 3. Each support means 20 comprises a pair of generally U-shaped wire members, each having a bight portion 22 and spaced parallel legs 24. The members are arranged with their bight portions 22 at opposite ends of the support means and with their legs 24 in spaced overlapping relationship. The free end of each leg 24 is bent to define a laterally extending hook 26 of such configuration that it may be readily engaged with or disengaged from an adjacent leg 24, all as clearly shown in FIG. 3. Obviously, the U-shaped members may be separated and stacked or stored in compact arrangement occupying very little space. When it is desired to install a spacer and to effect support thereof by the support means 20, one of the U-shaped members is positioned with its legs 24 extending through an upper cell 18, beneath the upper wall 28 thereof. The other U-shaped member is then placed in a position with its legs 24 extending over that wall 28 and the hook ends of all the legs are then engaged over intermediate portions of the corresponding legs of the other member. Generally, the initial engagement of the members will be with them in the positions indicated by dotted line in FIG. 3 whereupon the bight portions may be mutually pulled outwardly to cause the hooks 26 to slide along the legs with which they are engaged until they abut opposite edges of the top wall 28. The sire support means are sufficiently resilient to be frictionally held in the described position, as shown in FIG. 1, and at least the bight portions 22 are positioned laterally outwardly of the spacer 12 in position to rest on the tops of the articles 8 and thus support the spacer in the desired position. Clearly, the support means may be positioned in any desired cells 18 and as many support means as are deemed necessary may be applied to each load spacer structure, depending on its horizontal length.

The slidable relationship of the U-shaped members also permits their use with spacers 12 of many different widths.

FIG. 4 shows an alternative embodiment wherein a generally U-shaped wire member 30 is provided with an elongated bight portion 32 and widely separated legs 34. The legs 34 are sufficiently widely separated to extend through or engage with widely separated cells 18. In fact, the bight portion 32 may be of sufficient length so that the legs 34 engage the end cells at the top of the spacer structure. Preferably, a third leg 36 is secured to the bight portion 32 centrally located between the legs 34 to be engaged with and support an intermediate cell of the honeycomb structure. Alternatively, the intermediate leg 36 need not be secured to the bight portion 32 but may be in the form of a single elongated rod or wire to be passed through an intermediate cell and positioned with its ends merely resting on the bight portion 32 and it would thus provide adequate support for the intermediate cell mentioned.

As will be obvious, the form shown in FIG. 4 contemplates a second identical structure to be engaged therewith in the same manner as described with reference to FIG. 3.

While the description herein has been limited to a support means for holding only the top edge of a honeycomb structure in suspended relation between stacks of freight articles, it is

obvious that the same devices may be employed to engage opposite side edges of adjacent stacks when it is desired to position the honeycomb structure in a horizontally expandable attitude, as basically described in U.S. Pat. No. 3,405,659, previously identified.

The description herein specifically describes only support means made of wire but obviously other materials may be used and the different portions may be assembled from separate elements rather than being integral, as described.

While a limited number of specific embodiments of the invention have been shown herein, the same are merely illustrative of the principles involved and other specific forms may be employed.

I claim:

1. The combination comprising: a freight container; a plurality of discrete articles of freight in said container, said articles being arranged in at least two adjacent stacks of articles with a generally planar space therebetween bounded on opposite sides by said articles; an expandable honeycomb structure of sheet material substantially filling said space with the sheet material thereof extending transversely across said space, said honeycomb structure defining a multiplicity of open-sided cells and being expandable and contractable along said space; and support means supporting at least one edge of said honeycomb structure adjacent a corresponding edge of said space defined by said adjacent stacks, said support means comprising a pair of generally U-shaped members having spaced generally parallel legs extending laterally from a bight portion, said members being superimposed with their bight portions at opposite ends of said support means and with each of the legs of one member overlapping a corresponding leg of the other member, one leg of each overlapped pair passing through a cell of said honeycomb structure with its free end releasably secured to the other leg, on one side of said honeycomb structure, said other leg extending across said honeycomb structure outside said cell and having its free end releasably secured to said one leg on the other side of said honeycomb structure, at least portions of said support means on opposite sides of said honeycomb structure engaging outer faces of said adjacent stacks.

2. The combination defined in claim 1 wherein said free ends of said legs are releasably and slidably secured to the said other legs whereby said support means is extensible and contractable in a direction transverse to said generally planar space.

3. The combination defined in claim 2 wherein said support means is formed of elongated rodlike elements; said free ends being formed to define laterally extending hook portions adapted to releasably and slidably embrace said other legs.

4. The combination defined in claim 1 including a third leg extending from each bight portion between and spaced from said pair of legs, said legs being spaced apart sufficiently to engage different cells of said honeycomb structure.