Aug. 20, 1963 T. P. WHARTON 3,101,063

CUSHIONED SKID

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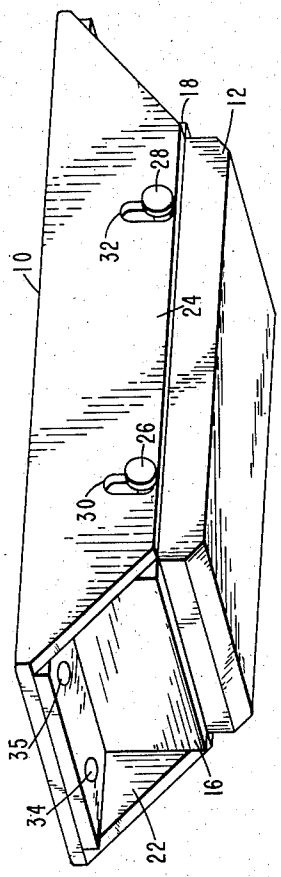


FIG. 1

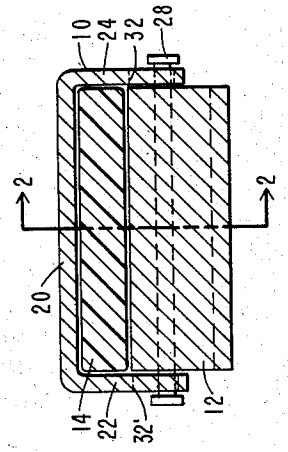


FIG. 3

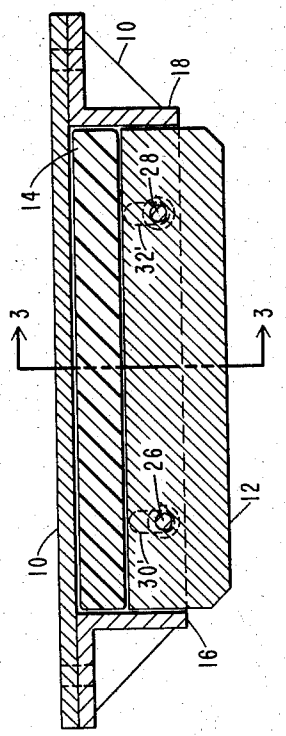


FIG. 2

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FIG. 4

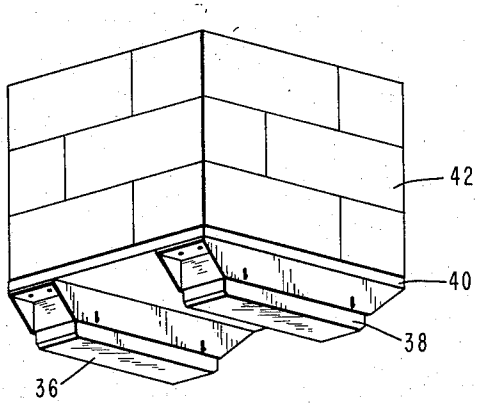
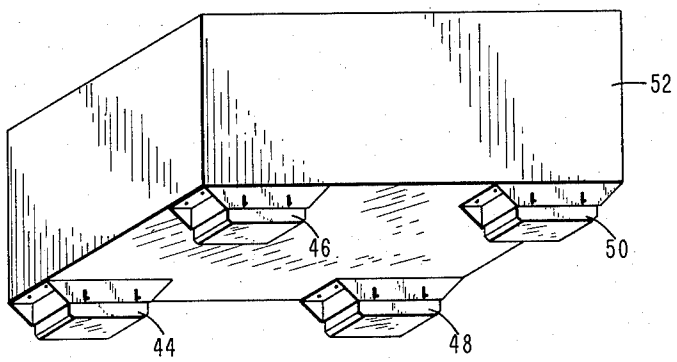


FIG. 5



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3,101,063
CUSHIONED SKID

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2 Claims. (Cl. 108—55)

This invention relates to an improved means for supporting loads such as boxes, crates and other containers in such a manner as to facilitate handling of the loads and to protect them from the shocks and vibrations normally received during such handling.

In the past, when dealing with large, bulky boxes and crates, it has been the practice to affix to them rubbing strips, or skids, to support them several inches off the floor, thus providing easy access for fork-lift trucks and other handling equipment. To facilitate the handling of smaller, less bulky packages, it is often the practice to provide platforms, or pallets, on which the packages may be stacked. The pallets are provided with skids or rubbing strips to support the load sufficiently far off the floor to permit access by handling equipment. The skids and rubbing strips which are presently in use generally are no more than a solid block or strip of wood, metal, plastic or fiberboard, affixed directly to the load or to the load-supporting pallet.

Such skids have been satisfactory when the loads being supported were sturdy and would not be damaged by the shocks and jolts normally received during handling and transportation. However, when it becomes necessary to ship articles which might be damaged easily by normal handling procedures, special packaging must be devised in order to provide the necessary protection. Such special packaging requires extra-strong containers to withstand the shocks and jolts received and requires bulky padding to protect against vibration and other hazards. The necessity for such special packaging in order to assure the safety of fragile articles during handling has thus resulted in overly bulky containers which are extremely wasteful of space. In addition, these packaging methods have not always proved to be effective.

It is therefore a feature of this invention to provide means for cushioning boxes, crates and other similar loads which may contain or include fragile and easily damaged articles, and at the same time permit reduction in the weight and strength requirements of the container itself.

It is a further feature of the invention to provide improved skids or rubbing strips for use on the bottom of boxes and crates, which skids may also serve to cushion the container to which they are fastened from the normal shocks and vibrations inherent in the handling of such containers and thus to protect the contents thereof.

It is also a feature of the invention to provide cushioned skids for use with pallets in order to protect the articles which may be stacked onthe pallets from the shocks which such articles might receive.

A still further feature of this invention is the provision of means for supporting a load in such a manner that vibration and shock will not be transmitted between the load and the support.

Another feature of the invention is the use of resilient cushioning material in combination with load-supporting skids.

In accordance with the various features of the invention, a cushioned skid is provided having an upper bracket member which is adapted to be attached to the load to be supported. This bracket member carries a lower base member or foot which is fastened to the bracket in such a manner as to be movable with respect thereto. Sandwiched between the bracket and the base member is a pad of compressible, resilient material. When the skid

is used to support a load, the resilient material will be compressed between the bracket and the base member and will provide a cushion between them. The amount of compression that takes place will be dependent upon the design of the skid and the weight of the load.

These and other features of this invention may be more fully appreciated when considered in the light of the following specification and drawings in which:

FIG. 1 is a perspective view of a preferred embodiment of the invention;

FIG. 2 is a longitudinal cross-section of the embodiment of FIG. 1 taken on line 2—2 of FIG. 3;

FIG. 3 is a transverse cross-section of the embodiment of FIG. 1 taken on line 3—3 of FIG. 2;

FIG. 4 is a bottom perspective view of a load-carrying pallet utilizing the cushioned skids of the invention; and

FIG. 5 is a bottom perspective view of a package, crate or the like having the cushioned skids of the invention fastened thereto.

Reference is now made to FIGS. 1–3 of the drawings in which are shown a perspective view and two cross-sectional views of a preferred embodiment of the cushioned skid of the invention. The skid is made up of three main portions, an upper member or bracket **10**, a lower member or foot **12** and a resilient pad **14**. The upper member, or bracket, **10** is generally U-shaped in transverse cross-section, as is shown in FIG. 3, and includes a rectangular central portion **20** and two side portions **22** and **24**. The side portions are perpendicular to the central portion of the bracket, extending downward from opposite sides of the central portion. This bracket may be formed from any suitable material, such as metal or plastic, and its dimensions may be dependent upon the particular load which is to be supported.

Disposed within the space formed by the side portions **22** and **24** of the bracket **10** is the resilient pad **14**. The length and width of the pad **14** is dependent upon the size of the bracket while its thickness depends upon the load which is to be carried and the material of which the pad is made. Any material may be selected which exhibits sufficient resiliency to insure that the vibrations and shocks anticipated during handling will be effectively dampened and the load thus protected. Suitable materials are foam or sponge rubber, foamed and expanded plastics and rubberized and bonded fibers.

A portion of the foot member or rubbing piece **12** is disposed between the side pieces **22** and **24** so as to hold the resilient pad **14** in place. The remainder of the foot **12** extends beyond the side pieces **22** and **24** to form the base upon which the skid rests. The rubbing piece **12** is movably attached to the bracket **10** by means of skid bolts or rods **26** and **28** which pass through the rubbing piece and extend through the slots **30**—**30'** and **32**—**32'**, respectively, located in the side portions **24** and **22**. Mounting the rubbing piece on the bracket in this manner allows the rubbing piece to move vertically with respect to the bracket and thus to apply compressive force to the resilient pad **14**. The foot **12** is loosely mounted so as to allow not only vertical motion but also a small amount of longitudinal and transverse motion. Rubbing piece **12** may be of any suitable material such as wood, metal or plastic, depending upon the application for which it is designed.

In order to prevent the pad **14** from becoming displaced lengthwise, end plates **16** and **18** are provided. As shown in FIG. 2 of the drawings, the end plates are L-shaped in cross-section with one leg extending along the center portion of the bracket **10** and the other leg extending perpendicularly thereto. These end plates may be fastened to the bracket **10** in any suitable manner, such as by welding or by means of bolts. While the end plates **16** and **18** are shown as angles, they may be of other suitable shapes.

The cushioned skids described above may be fastened to the load which is to be supported in any one of several ways. Thus, the bracket **10** may be glued, cemented, nailed or bolted to the load, or may be affixed by means of angle irons or brackets. In the embodiment illustrated in the drawings, mounting holes **34** and **35** (FIG. 1) have been provided in the bracket **10** and in the end plates **16** and **18** to allow the skid to be nailed or bolted to the load. These mounting holes may also be used in fastening the end plates to the main bracket **10**, the same bolts or nails which affix the skid to its load being used to hold the end brackets in place.

Typical applications of the cushioned skids of the invention are shown in FIGS. 4 and 5. In FIG. 4 cushioned skids **36** and **38** are each mounted along the full length of a load-carrying pallet **40**. The load **42** may comprise a number of small packages or may comprise a single large package. The skids **36** and **38** may be bolted to the pallet **40**, supporting it a few inches above the floor so as to facilitate handling by fork-lift trucks and the like. In the event that fragile items are included in the load **42**, the cushioned skids **36** and **38** will prevent shocks, such as may be generated when the load is set down on the floor, from being transmitted through the rubbing pieces to the load.

In the application shown in FIG. 5, cushioned skids **44**, **46**, **48** and **50** are fastened directly to a load **52**. This load may be, for example, a carton or crate of any desired size. The cushioned skids provided at the four corners of the load **52** prevent the load from receiving jarring shocks and vibrations during handling and transportion, thus allowing the crate or container to be less massive than was possible with previous skids or rubbing strips. It will be apparent that any number of cushioned skids may be affixed to the container **52**, the exact number and size depending upon the type of cushioning material pads used in constructing the skids, and on the weight and fragility of the load. The thickness of pads used depends on the type of cushioning material used, the fragility of the load, and the anticipated shock in handling. These relationships may be defined by the following equations:

$$(1) \qquad A=\frac{K_1 W g}{f}$$

$$(2) \qquad t=\frac{K_2 e}{gh}$$

where,

A=total bearing area of the cushioning pads
t=the thickness of the cushioning pads
W=total weight of the load
g=fragility of the load
h=anticipated height of drop in handling
f=stiffness factor of the cushioning material
e=deflection factor of the cushioning material
K_1 and K_2=constants for given cushioning materials

In a properly designed cushioned skid there will be a mathematical relationship between the amount of cushioning material and the gross weight of the load to be borne such that when the container is subjected to hazards such as are anticipated in handling and shipment, the cushioning material will be compressed to its point of maximum operating efficiency. For most materials this compression will generally be between 50 and 70 percent of the thickness of the material. Thus the thickness of the cushioning material should be selected so that upon impact of the load the material will compress through a distance

great enough to prevent damaging shocks from reaching the load.

Although a specific embodiment of the invention has been set forth, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the scope of the invention. Thus, for example, the bracket **10** may be solid, as shown, or may be perforated or may consist of a skeleton frame. Further, although the resilient material is normally used in compression, the skids could be so formed as to use this material in tension, torsion, shear or in combinations thereof. In some designs, it may be desirable to eliminate the rubbing piece **12** entirely, allowing the resilient material to be directly in contact with the floor. Thus, it is intended that the scope of the invention be limited only by the following claims.

What is claimed is:

1. A cushioned cargo device including a container in which goods may be placed, a plurality of cushioning skids attached to the container to absorb shock and prevent damage to lading disposed therein, each skid including a substantially U-shaped main frame having a central portion attached to the container and two slotted side portions extending substantially perpendicular to the central portion, a foot member having bolt-like members attached thereto and extending therefrom, said foot member being disposed with the space lying between said side portions of said U-shaped main frame, said bolt-like members extending through the slots of said side portions of said U-shaped main frame, a piece of resilient material disposed under compression between the central portion of said U-shaped main frame and said foot member, and a pair of end plates attached to the U-shaped main frame at the ends thereof whereby said piece of resilient material is encased within the space defined by the U-shaped main frame and the foot member.

2. A portable article-carrying device which is cushioned to prevent damage from shock including a container in which lading may be placed, at least one skid attached to the container to cushion the container, each skid including a U-shaped main frame having a cenral portion and two slotted side portions, a foot member having bolt-like members attached thereto and extending therefrom, said foot member being disposed within a portion of said U-shaped main frame between said side members, the remainder of said foot members extending from the side portions of said U-shaped main frame with the bolt-like members extending through the slotted side portions, a piece of resilient material disposed in compression between the foot member and the central portion of said U-shaped main frame, a pair of end plates attached to the main frame at the ends thereof whereby said piece of resilient material is enclosed within the space defined by the U-shaped main frame and the foot member.

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