

May 1, 1962

H. P. SCHULZE ETAL

3,031,820

PACKER GRID

Filed May 8, 1959

2 Sheets-Sheet 1

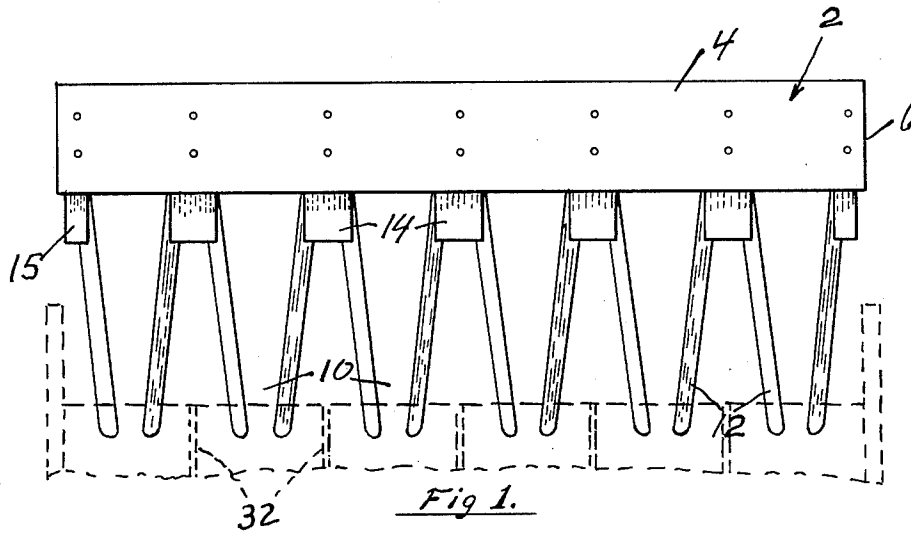


Fig 1.

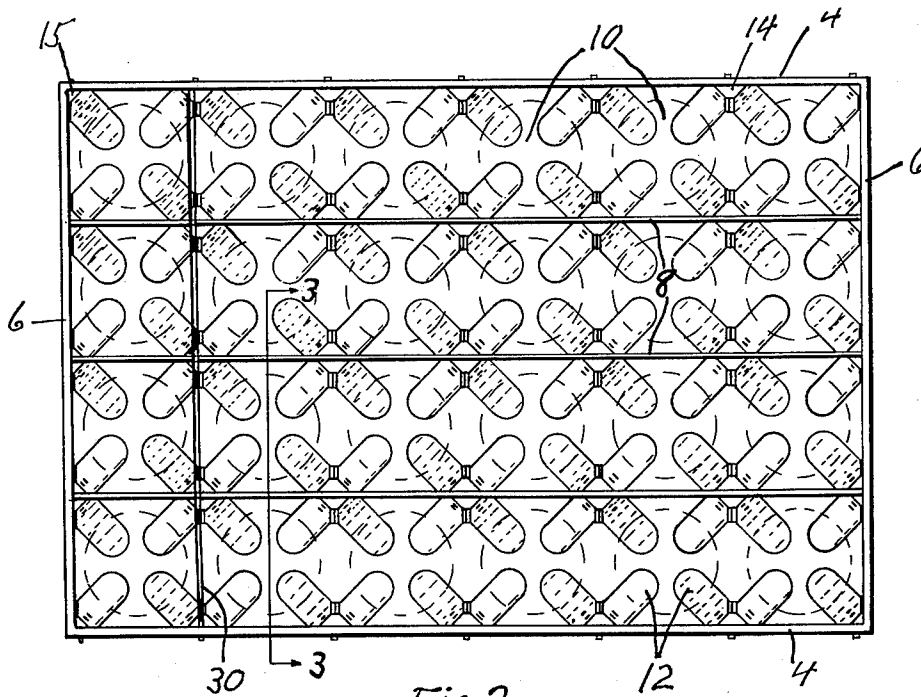


Fig 2.

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2 Sheets-Sheet 2

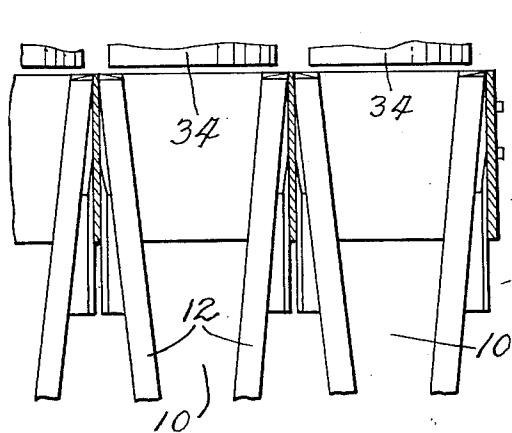


Fig. 3

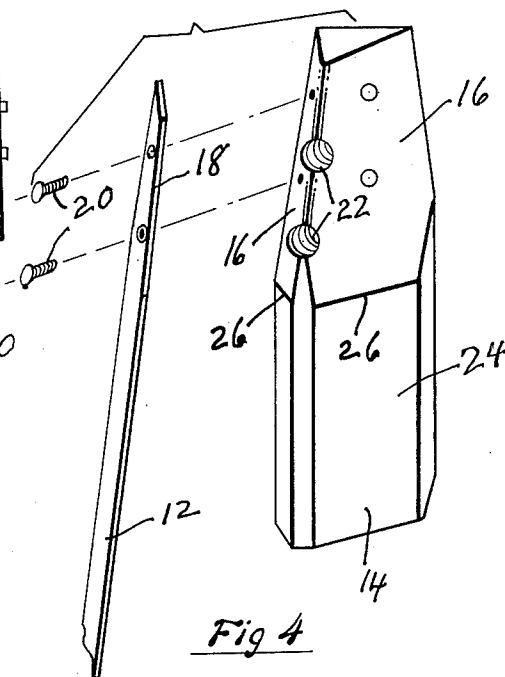


Fig 4

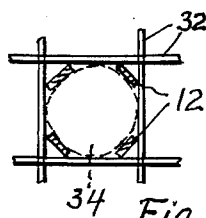
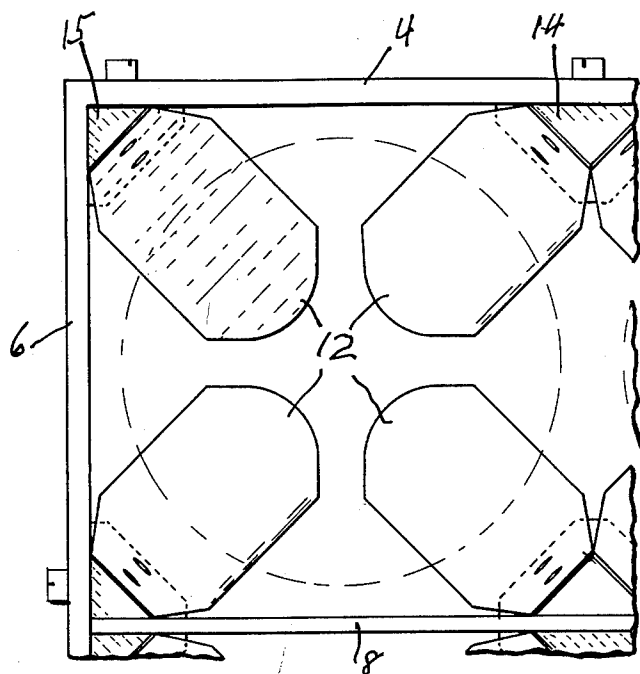


Fig 6

Fig 5



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PACKER GRID

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4 Claims. (Cl. 53-247)

This invention relates to packer grids used in automatic packaging machines for arranging bottles and the like in crates or cartons provided with dividers or compartments for holding the bottles. Packer grids embodying the present invention may be employed with various types of packaging machines such as those shown and described in Patents Nos. 2,701,085; 2,727,664 and 2,753,673, for example.

The packaging machines of these and other patents employ a packing grid which is designed to conduct and guide bottles into a crate or carton from equipment which serves to move the bottles into a predetermined arrangement. For this purpose, the grid generally embodies members arranged in crossed relation to form bottle guiding channels and to provide yieldable fingers which extend downward at the sides of the channels to guide and retard the movement of the bottles as they pass through the grid from the arranging mechanism to the crate or carton. However, if a bottle is displaced or tilted for any reason, it may engage one or more of the cross members so that it will not move downward properly or may drop in such a way as to cause breakage. Moreover, the fingers tend to wear and sometimes are bent in such a way as to engage dividers in the crate or carton causing injury to the carton, fingers or bottles. This problem is particularly troublesome when the cartons are formed of light cardboard or other material which is flexible or when the dividers for any reason are not accurately positioned to receive the bottle guiding fingers of the packer grid.

In accordance with the present invention, these objections and limitations of prior packer grids are overcome and novel constructions provided which are economical to produce and assure more accurate and safe delivery of bottles from assembling equipment to a carton, crate or container.

These advantages are preferably attained by providing the packer grid with fingers which are arranged at an angle to the sides of the channels in the grid and extend into the corners of the compartments of the crate, carton or container in which the bottles are being deposited. In this way, the fingers engage the dividers in the crate or carton and assure proper guiding of the bottles relative thereto. Moreover, if the carton is formed of light cardboard or other movable material, the fingers will shift and correct the positions of the dividers so as to prevent a bottle, even though tilted, from coming to rest on the edge of a partition or divider. The grid further may embody a plurality of members extending in only one direction parallel to the sides of the grid whereby the usual cross members can be eliminated and the danger of displacement of bottles is reduced. The construction also may embody yieldable fingers which are identical in size and shape so that only a limited number of elements are required to produce the grid and the cost thereof is materially reduced.

Accordingly, the principal object of the present invention is to provide a novel type of packer grid for use in packaging machinery whereby the guiding and placement of bottles in cartons, crates and the like can be effected with a minimum of breakage and error.

A further object of the invention is to reduce the cost and simplify the construction of packer grids employed in packaging machinery.

A specific object of the invention is to provide a pack-

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er grid with bottle guiding fingers arranged to engage the corners of the compartments in a carton or crate in which bottles are to be positioned.

These and other objects and features of the present invention will appear from the following description thereof wherein reference is made to the figures of the accompanying drawings.

In the drawings:

FIG. 1 is a side elevation of a typical form of packer grid embodying the present invention;

FIG. 2 is a top plan view of the packer grid shown in FIG. 1;

FIG. 3 is a sectional view of the construction shown in FIGS. 1 and 2 taken on the line 3—3 thereof;

FIG. 4 is an exploded view illustrating a preferred method of mounting a flexible finger of the packer grid;

FIG. 5 is an enlarged plan view showing one of the bottle guiding channels of the packer grid of FIGS. 1 to 4; and

FIG. 6 is a diagrammatic illustration showing the manner in which the bottle guiding fingers contact the corners of a compartment in a crate or carton.

In that form of the invention chosen for purposes of illustration in the figures of the drawings, the packer grid embodies a frame indicated generally at 2 and embodying longitudinally extending side plates 4 and the end plates 6 which are secured together in any suitable way to form a frame of the desired size for positioning bottles in a crate or carton. A plurality of strips of material 8 extend lengthwise of the frame parallel to the side plates 6 in equally spaced relation, three of such strips being shown to provide four parallel rows of bottle receiving channels 10.

Each bottle receiving channel is of the type illustrated in FIG. 5 and is defined by the downwardly inclined flexible fingers 12 which are mounted upon supporting blocks 14 and 15. The supporting blocks 15 are located in the corners of the frame 2 and on the end plates 6 at the points where the strips 8 engage the end plates. The supporting blocks 14 are located in equally spaced relation at intermediate points lengthwise of the side plates 4 and at corresponding opposite locations on the strips 8. Each of the supporting blocks is provided at its upper portion with upwardly and outwardly inclined surfaces 16 which are transversely inclined at substantially 45 degrees with respect to the surfaces of the sides 4 and strips 8. The upper ends 18 of the fingers 12 are secured to the surfaces 16 of the supporting blocks by means of bolts 20 or the like, whereas the supporting blocks themselves may be secured to the side plates and to the strips 8 by bolts passing through openings 22 in the upper portion of the blocks.

The lower portions 24 of the supporting blocks extend vertically and a pressure line 26 forms the intersection between the inclined surface 16 and the vertical lower portion 24 of the supporting block. The bottle guiding fingers 12 are formed of flexible material and the lower ends thereof extend downward below the frame 2 and below the lines 26 on the supporting blocks 15 and 16. The lower ends of the fingers 12 are thus prevented from bending outward beyond a vertical position and are prevented from engaging the edges of the partitions or dividers within a crate or carton even when a bottle is tilted sideways as it passes downward between the fingers 12 of the grid. The crate or carton in which the bottles are to be placed can then be moved upward in the usual manner to a position such as that shown in dotted lines in FIG. 1 to receive the bottles passing downward through the packer grid from an assembly device located above the grid.

In practice it has been found advantageous to form the fingers of relatively heavy flat strips of nylon. Such

material is not only wear resistant but is characterized by a frictional coefficient which serves to aid in assuring a gradual and relatively slow movement of the bottles downward between the fingers from a bottle arranging device to a crate or carton positioned below the packer grid.

The transverse inclination of the surfaces 16 of the supporting blocks serve to position the flat surfaces of adjacent fingers 12 at angles of approximately 90° with respect to each other whereas the opposed positions of the supporting blocks on the strips 8 and on the sides 4 of the frame 2 serve to position other fingers at 90° with respect thereto. In this way, the fingers define bottle receiving channels 10 which, as shown in FIGS. 3 and 5, are of greater diameter at their upper ends than the bottles 34 which they are to receive whereas the fingers extend inwardly to frictionally engage the sides of the bottles and guide them as they move downward through the grid. The fingers thus serve to arrange the bottles in properly spaced relation as they pass through the packer grid rendering it unnecessary to employ the transversely extending cross members heretofore required in packer grids. However, it will, of course, be understood that such transversely extending cross members can be employed in the assembly, if desired, and as shown at 30 in FIG. 2.

As shown in FIG. 3, the top or upper extremity of the supporting blocks may, if desired, be bevelled or inclined inward toward the bottle receiving channels 10 so that even when a bottle is tilted to one side by the bottle arranging device above the packer grid, the bottle will be directed inward toward the bottle receiving channel 10 so as to be straightened up or prevented from remaining in engagement with the upper ends of the supporting blocks when the remaining bottles pass down through the grid.

One of the important advantages of the present invention resulting from the arrangement of the fingers in the angular position shown resides in the fact that upon upward movement of a crate or carton beneath the packer grid into the dotted line position of FIG. 1 to receive bottles from the assembling device and grid, the fingers 12 extend into the compartments of the carton at points spaced from the dividers 32 which form the sides of the compartment. However, when a bottle passes down through the bottle receiving channel 10, it engages the fingers and forces them apart so that they are pressed into the corners of the compartment and into locations which will not be occupied by the bottle or restrict the effective area of the compartment. The flat inner surfaces of the fingers then cooperate with the dividers to present an octagonal bottle guiding zone as shown in FIG. 6 whereby the bottle is contacted at eight points about its circumference as it is directed into the compartment. Moreover, the lower ends of the fingers press the corners of the compartments outward so as to straighten them up and overcome any inward distortion or deflection of the dividers which might interfere with the downward movement of the bottle. Such engagement of the fingers with the dividers also prevents undesired or excessive outward movement of the lower ends of the fingers as they spread apart during the downward movement of bottles into compartments of the crate or carton. The fingers therefore cannot engage the edge of a divider or be bent so as to project into the wrong compartment. Moreover, by forming the fingers of material such as nylon and extending the supporting blocks downward as shown at 24, the fingers are prevented from excessive or permanent outward bending or distortion which might result in any improper operation.

The construction thus provided renders it possible to employ identical fingers throughout the assembly so that the cost of manufacturing the packer grid is considerably

reduced. Moreover, if any fingers should be worn or broken, it may be readily replaced by simply removing the attaching screws 20 and substituting a new finger. However, it has been found in practice that when the flexible fingers 12 are formed of nylon, they wear considerably longer than when the fingers are formed of metal or other material. This fact, in combination with the characteristic frictional properties of the nylon serves to assure long continued and smooth operation of the packer grid when employed in any type of packing equipment.

While the particular form of the packer grid shown and described above is preferred, it will be apparent that the various elements of the combination can be changed in form, size, construction and arrangement. In view there, it should be understood that the particular embodiment of the invention shown in the drawings and described above is intended to be illustrative only and is not intended to limit the scope of the invention.

We claim:

1. A packer grid for guiding bottles from an assembly device to a crate or carton in a packaging machine, said grid comprising a rectangular frame, strips of material supported by said frame extending in equally spaced relation parallel to opposite sides of the frame, flexible, elongated, substantially flat fingers having the upper ends thereof positioned adjacent said frame and strips and held in inclined positions sloping downward toward each other but spaced apart a distance greater than the bottles to be guided thereby, the lower ends of the fingers extending below the frame and defining a bottle guiding channel of less diameter than the bottles to be guided, said fingers presenting flat surfaces positioned at substantially 45° with respect to said strips and opposite sides of the frame, supporting blocks to which the upper portions of said fingers are secured, said supporting blocks being mounted on said strips and opposite sides of the frame and presenting upwardly and outwardly inclined upper surfaces engaged by the upper portions of the said fingers, the lower portions of said supporting blocks extending substantially vertically downward below said outwardly inclined surfaces in position to limit the outward movement of the lower portions of said fingers upon the movement of a bottle downwardly through said bottle guiding channel.

2. A packer grid of the character defined in claim 1, wherein the lower ends of the fingers are arranged and supported so that the lower ends thereof are movable relative to the supporting blocks into the corners of rectangular compartments of a crate or carton to which bottles are guided by the fingers but are prevented from movement outward beyond a vertical position by engagement with the lower portions of the supporting blocks.

3. A packer grid of the character defined in claim 1, wherein said fingers are formed of nylon.

4. A packer grid of the character defined in claim 1, wherein all of said fingers are of identical size and shape and are formed of flexible nylon.

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