March 28, 1939. G. L. STUDLEY 2,152,610

HEAVY DUTY FIBERBOARD KEG

Filed Jan. 31, 1938

Fig. 1

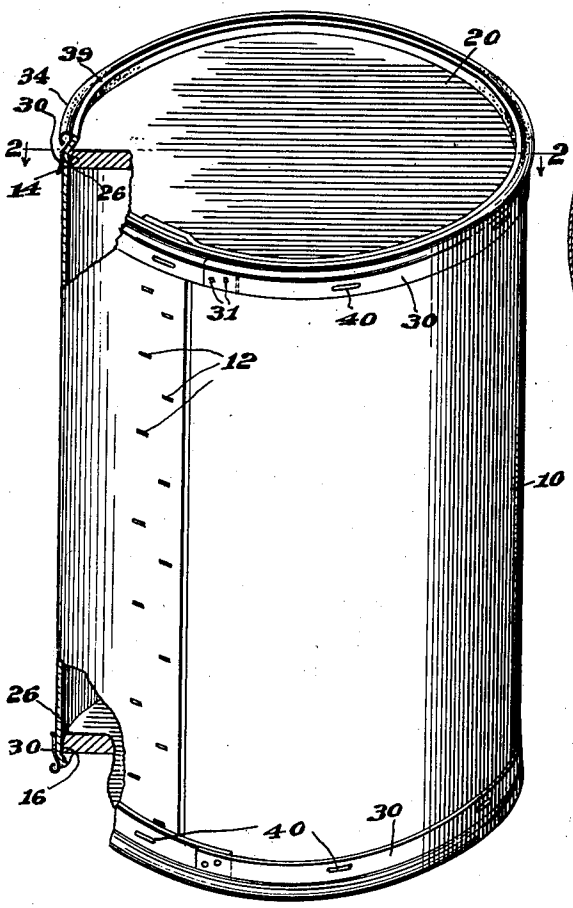


Fig. 2

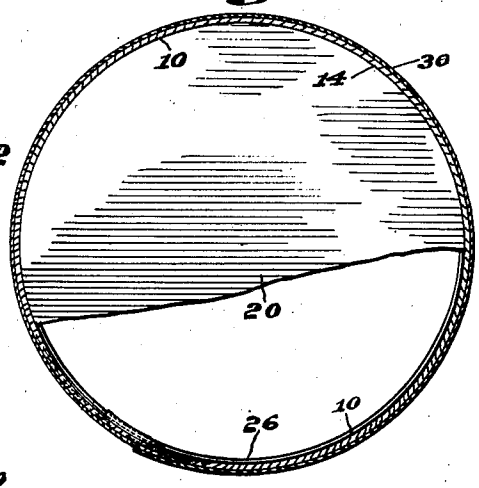
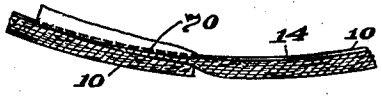


Fig. 4



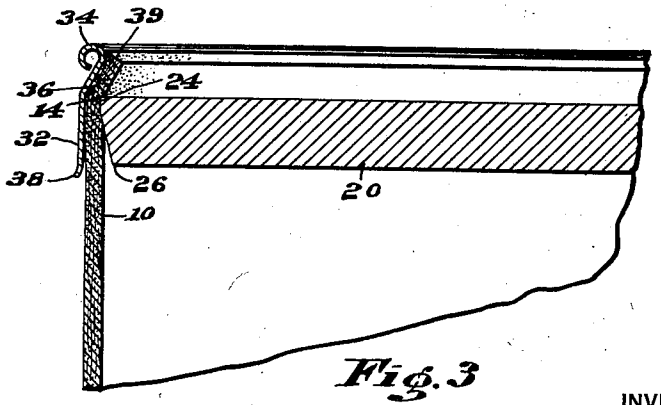


Fig. 3

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HEAVY DUTY FIBERBOARD KEG

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Application January 31, 1938, Serial No. 187,869

6 Claims. (Cl. 229—5.7)

This invention relates to containers of the drum or keg type, particularly suitable for packaging of heavy bulk materials.

Such materials as nails, nuts, bolts, metal tubings, and other heavy bulk materials, have in the past often been shipped in wooden kegs having the common barrel construction, including drum heads forming top and bottom closures. When materials of the type referred to comprise the contents of such containers, the net weight of the contents often runs up to 100 or more pounds, and the containers, being subject to severe jolts during the handling normally incident to present day transportation, undergo considerable strains, particularly the closures thereof. The wooden kegs are sometimes reinforced with metallic hoops, both to strengthen the container and to afford suitable washers for the fastening means utilized to secure the drum heads in the keg. The usual coarse, tough texture of the wood used for the staves of such kegs permits adequate fastening of the drum heads, as by nails, for such wood provides a satisfactory anchorage for the nails, without likelihood of a splitting of the wood even when severe stresses are imposed upon the head by the contents, as when the keg is set down.

So far as is known, the wooden kegs fulfill their packaging purpose in adequate manner. However, as is obvious, their adoption as a standard packaging method is an item of considerable initial expense, and each and every handling thereof, from the keg manufacturer, who often is located at some distance, until the filling operation, involves factors of labor, weight, and space. Barrel shaped articles are at best clumsy and awkward, regardless of how they are handled. The factor of space cannot be disregarded, as the barrel shaped wooden kegs are usually stored or handled in numbers by pyramiding, which is highly space consuming, especially if abutting walls, building partitions, or the like, are not available. Stacking of barrel shaped kegs on their sides is not common because special precautions must be taken to prevent undermining of a stack by displacement of an underlying unit.

The factor of space shortable has sometimes been overcome by assembling the kegs in the user's plant just prior to the filling operation. However, this involves not only capital expenditure for barrel assembling machinery, but also requires the services of a skilled cooper and, in the case of large companies, it is not unusual to find a separate department confined to wooden keg manufacture, with consequent complications.

The provision of cheaper, lighter, and more convenient containers, suitable for packaging goods of the type previously referred to, has been attempted unsuccessfully in several instances. Fiber board inherently is completely satisfactory for formation of the upstanding side walls of kegs of this type. But use of fiber board for this purpose presents a problem in satisfactory attachment of end closures. The structure of fiber board is unfortunately not sufficiently tough to anchor nails satisfactorily, especially near the marginal edges thereof, and experience has shown that when fiber board containers with wooden drum heads have been experimented with, either the fastening means or nails are torn completely from the fiber board by severe jolts, or else the drum heads become loosened by repeated movement of the fastening means or nails in the fiber board, resulting successively in additional internal space for movement of the contents, increased impacts against the head, and final splitting of the fiber board, thus permitting the contents to spill from the keg. The likelihood of such occurrence, even in only a small percentage of kegs used, has been sufficient to prevent adoption thereof, due in part to the high per unit value of the contents in containers of this size.

Fiber board kegs have therefore not heretofore been found successful in the packaging of heavy materials of the type previously referred to.

My invention relates to the provision of fiber board kegs which overcome the previously encountered difficulties of securing a drum head construction which will permit commercial transportation therein of such heavy materials. Kegs constructed in accordance with my invention have withstood tests relative to strength and durability, as specified by prospective users, in a completely satisfactory manner. In addition, the nature of my construction permits delivery of the kegs to a user in knocked down condition, if desired, thereby reducing tremendously cubic foot transportation charges on unfilled space, often encountered in empty barrel shipments, and permitting freight shipments heretofore out of the question because of prohibitive rates. At the same time, the knocked down kegs may be so easily and expeditiously assembled by the user that they can be easily stored in a minimum space in a knocked down condition until just prior to the filling operation, and may then be set up, as required, without the services of specialized skilled operators or complicated equipment.

These and other advantages of my construction will be more fully apparent from the accompanying description of the preferred form of my in-

vention, illustrated in the accompanying drawing, in which,

Fig. 1 is a perspective view of one form of my invention, with portions thereof broken away to illustrate in cross section the drum head fastening construction;

Fig. 2 is a cross-sectional view taken on lines 2—2 of Fig. 1 with a portion of the drum head broken away; and

Figs. 3 and 4 are enlarged details taken from Figs. 1 and 2.

My kegs have substantially straight side wall portions formed preferably from flat, rectangular sheets of fiber board, shaped into tubular form. Thus, in Fig. 1, I have illustrated a fiber board sheet 10, having overlapping ends and fastened in tubular form in any convenient manner, as by rivets or a series of staples 12. Either before or after this shaping operation, I form in the sheet 10 two internal annular grooves 14 and 16, spaced inwardly from edges of the tube, one at the top and one at the bottom. Preferably these grooves are creases formed by a stamping or rolling operation, and do not involve a cutting removal of any portion of the stock, thus avoiding as much as possible any weakening of the fiber board structure.

The drum head construction, which is preferably identical at both ends of the tube, comprises a circular drum head 20, preferably shaped as shown in Figs. 1 and 2, to have a circumferential surface 24 of greater diameter tapering inwardly to a circumferential edge 26, of less diameter. The drum head 20 is fitted internally of the tube, as shown, so that the bottom edge of surface 24 seats in the crease 14 and the edge 26 is disposed inwardly of the keg, the bottom taper aiding insertion.

To fasten the head 20 in this position, a hoop 30, which may be conveniently formed from sheet metal stock, riveted, as at 31, into hoop form, is positioned exteriorly of the fiber board. Prior to formation into hoop form, the sheet stock is so shaped that the hoop will preferably include a bottom portion 32 of greater internal diameter, a beaded top portion 34 of less internal diameter, and an intermediate internal tapering surface 36. For convenience in positioning the hoop exteriorly of the fiber board, the bottom portion 32 may also be provided with a bottom flare 38. The hoop 30 is so shaped and has internal diameters so related to the diameter of the drum head, plus fiber board thickness, that, as the hoop 30 is brought to the position shown in Fig. 1, marginal portions of the fiber board sheet 10 are folded radially inwardly by surface 36 over the top edge of head 20, to crimp the outer edge 39 of the fiber board, as shown in Fig. 3, to a diameter which is less than the diameter of portion 24 of drum head 20; and preferably the internal diameter of the top hoop portion 34 also is less than the greatest diameter of head 20 so that the entire thickness of edge 39 is crimped inwardly of the circumferential edge 24 of greatest diameter of head 20; and in any event is no greater than the greatest diameter of head 20. The hoop is preferably driven into the position shown by a suitable press, and may then be fastened in such position by a series of staples 40, nails, or other fastening means, which pass through the hoop 30, acting as a washer, and fiber board 10, and lodge in the head 20.

By this construction the fiber board anchorage of the staples 40 will take very little of any thrust exerted by the contents, either while at rest or in motion for the reason that the tough and somewhat rigid crimp of outer edge 39 of the fiber board cylinder, held in such position by hoop 30, very effectively prevents displacement of the head 20 especially when, as in my preferred form, the internal diameter of portion 34 of hoop 30 is smaller than the diameter of the drum portion 24. Forces exerted upon the head 20 by contents of the keg will be transmitted through the fiber board 10 to the surface 36 of hoop 30, and horizontal components of such forces will be completely absorbed by the structural rigidity of an annulus—the hoop 30—in its own plane.

The fiber board sheet 10, which may already have formed longitudinally thereof, adjacent each of the edges, the two creases 14 and 16, may be shipped to a keg user in flat form, together with two drumheads 20 and two hoops 30, of the type illustrated in Fig. 1, the sheet 10 having a length dimension somewhat greater than the greatest circumferential measurement of the drum heads. The blank and such drum heads may be assembled to form the keg previously described, by stapling, or otherwise fastening the blank into tubular form and thereafter inserting heads 20 and positioning hoops 30 to fold over marginal portions of the tube 10. Fastening means 40 can then be inserted. Quite in contrast to the involved procedure of wooden barrel assemblage, the operation of assembling my keg requires at most an ordinary stapling machine, and a hammer.

My kegs may also find convenient use for shipment of granulated or powdered materials, and in order to provide a tighter fit between the drum head and the fiber board adjacent the overlapped portions of the fiber board, the grooves 14 and 16 may be chamfered, as illustrated in the enlarged detail of groove 14, shown in Fig. 4, by reference 70, along that portion of the groove which is on the internal overlapped portion of the fiber board. By such chamfering, the crease is made smooth and more nearly circular, to provide a close proximity between the circumferential edge of the head 20 and the fiber board. The chamfering operation may be done either before or after formation of the fiber board sheet into tubular form.

It will be understood that other methods of forming the tubular fiber board side wall portion may be satisfactory, and it is not necessary to have the overlapped vertical seam, which I have illustrated as my preferred form. Likewise, while I have suggested the use of wood in the formation of the drum heads 20, such drum heads may be formed from other suitable materials, alone or in combination.

The grooves 14 and 16 are a particular aid to proper assemblage of the drum head, by insuring a seating of the drum head in a proper position, the fiber board below the groove 14 having a tendency to contract inwardly, as shown in the drawing.

I claim:

1. A keg of the character described, comprising a fiber board sheet in overlapped cylindrical form having at least at one end thereof a drum head construction including a circular drum head seated interiorly of said cylinder, and a metallic hoop having a substantially cylindrical lower portion of an internal diameter greater than any diameter of said head, and an adjacent frustoconical portion tapering upwardly and radially inwardly therefrom to an internal diameter less than the greatest diameter of said head, said hoop being preformed and movable as a unit relative to said fiber board upon assembly or disassembly of

said drum head, but after assembly, being fixedly positioned exteriorly of said cylinder with the cylindrical portion thereof disposed circumferentially around said head and with said frusto-conical portion extending upwardly over said head, thereby folding marginal portions of said fiber board radially inwardly over the top edge of said head, and presenting an unconfined top edge of said fiber board crimped to an exterior diameter smaller than the greatest diameter of said head, whereby accidental displacement of said head from said keg is prevented.

2. A keg of the character described, comprising a fiber board sheet having opposing edges thereof overlapped to form a substantially cylindrical side wall portion of said keg, said keg having at least at one end thereof a drum head construction including a drum head seated interiorly of said cylinder, a preformed metallic hoop having a substantially cylindrical lower portion of an internal diameter greater than any diameter of said head, an adjacent frusto-conical portion tapering upwardly and radially inwardly therefrom to an internal diameter uniformly less than the greatest diameter of said head, and an external top bead, said hoop being positioned wholly exteriorly of said fiber board with the cylindrical portion thereof disposed circumferentially around said head and with said frusto-conical portion extending upwardly over said head, thereby folding marginal portions of said fiber board radially inwardly over the top edge of said head, and presenting an unconfined top edge of said fiber board crimped to an exterior diameter smaller than the greatest diameter of said head, and fastening means for retaining said hoop so positioned relative to said head, whereby accidental displacement of said head from said keg is prevented.

3. A keg of the character described, comprising a fiber board sheet in overlapped cylindrical form having at least at one end thereof a drum head construction including an internal annular groove in said cylinder spaced from an edge thereof, a circular drum head seated interiorly of said cylinder with a circumferential edge thereof disposed in said groove, a preformed metallic hoop having a substantially cylindrical lower portion of an internal diameter greater than any diameter of said head, and an adjacent frusto-conical portion tapering upwardly and radially inwardly therefrom, said hoop being positioned exteriorly of said cylinder with the cylindrical portion thereof disposed circumferentially around said head and with said frusto-conical portion folding marginal portions of said fiber board radially inwardly over the top edge of said head, thereby crimping the edge of said fiber board to a diameter smaller than the greatest diameter of said head, and fastening means for retaining said hoop so positioned relative to said head, whereby accidental displacement of said head from said keg is prevented.

4. A keg of the character described, comprising a fiber board sheet in overlapped cylindrical form, having at least at one end thereof a drum head construction including a drum head positioned interiorly of said cylinder, a metallic hoop having a substantially cylindrical lower portion of an internal diameter greater than any diameter of said head and an adjacent frusto-conical portion tapering upwardly and radially inwardly therefrom to an internal diameter no greater than the diameter of the outer surface of said drum head, said hoop being preformed and movable as a unit relative to said fiber board upon assembly or disassembly of said head but after assembly being positioned exteriorly of said cylinder with the cylindrical portion thereof disposed circumferentially around said head, and with said frusto-conical portion extending upwardly, thereby folding marginal portions of said fiber board radially inwardly over the top edge of said head, and presenting an unconfined top edge of said fiber board crimped to a diameter smaller than the diameter of the outer surface of said head, and fastening means for retaining said hoop so positioned relative to said head, whereby accidental displacement of said head from said keg is prevented.

5. A keg of the character described, comprising a fiber board sheet in overlapped cylindrical form having at least at one end thereof a drum head construction including a chamfered groove along the internal overlapping portion of said fiber board spaced from an edge thereof, a circular drum head seated interiorly of said cylinder with a portion of a circumferential edge thereof disposed in said chamfered groove, a metallic hoop having a substantially cylindrical lower portion of an internal diameter greater than any diameter of said head and an adjacent frusto-conical portion tapering upwardly and radially inwardly therefrom to an internal diameter no greater than the greatest diameter of said head, said hoop being positioned exteriorly of said cylinder with the cylindrical portion thereof disposed circumferentially around said head, and with said frusto-conical portion extending upwardly over said head, thereby folding marginal portions of said fiber board radially inwardly over the top edge of said head, and presenting an unconfined edge of said fiber board crimped to a diameter smaller than the outer surface diameter of said head, and fastening means for retaining said hoop so positioned relative to said head, whereby accidental displacement of said head from said keg is prevented.

6. A keg of the character described, comprising a fiber board sheet in overlapped cylindrical form having at least at one end thereof a drum head construction including a circular drum head seated interiorly of said cylinder, and a metallic hoop having a substantially cylindrical lower portion of an internal diameter greater than any diameter of said head, and an upper frusto-conical portion tapering upwardly and radially inwardly therefrom to an internal diameter less than the greatest diameter of said head, said hoop being preformed and movable as a unit relative to said fiber board upon assembly and removable therefrom as a unit thereby to permit disassembly of said hoop and said drum head substantially intact and in condition for ready reassembly, but after assembly, being fixedly positioned exteriorly of said cylinder with the cylindrical portion thereof disposed circumferentially around said head and with said frusto-conical portion extending upwardly over said head, thereby folding marginal portions of said fiber board radially inwardly over the top edge of said head, and present the top edge of said fiber board crimped to an exterior diameter smaller than the greatest diameter of said head, whereby accidental displacement of said head from said keg is prevented.

GERARD L. STUDLEY.