April 17, 1951 P. ZALKIND 2,549,356

ROLLER BEARING FOR COLLAPSIBLE CONTAINERS

Filed June 30, 1944

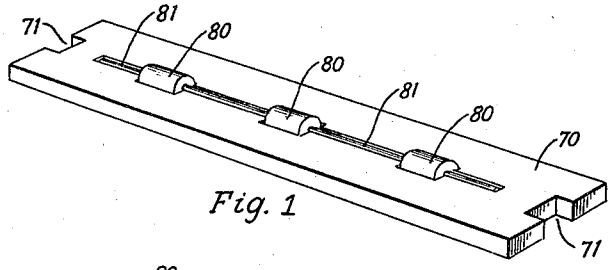


Fig. 1

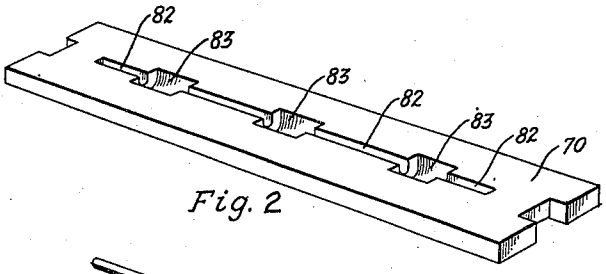


Fig. 2

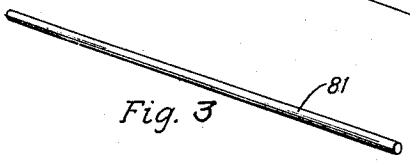


Fig. 3

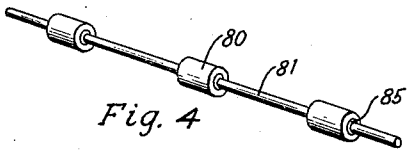


Fig. 4

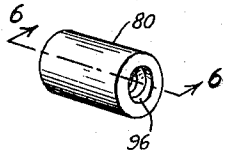


Fig. 5

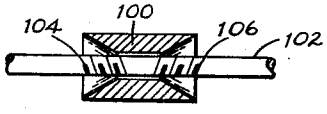


Fig. 7

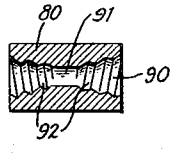


Fig. 6

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2,549,356

ROLLER BEARING FOR COLLAPSIBLE CONTAINERS

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Original application February 26, 1943, Serial No. 477,203. Divided and this application June 30, 1944, Serial No. 542,845

9 Claims. (Cl. 308—3.8)

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This invention is a division of my application Serial No. 477,203, filed February 26, 1943, now Patent No. 2,439,998, and relates to collapsible containers of the casing and drawer type adapted to co-act to form file cabinet sections which may be stacked one upon the other.

In the formation and construction of such casings and drawer combinations, particularly where they are made of a sheet material having relatively little edgewise compressive strength such as paper, corrugated board and the like, it is necessary that reinforcing means be applied particularly to the casing section so that when a plurality of casings are stacked one upon the other, the superposed load on a lower casing can be resisted so as not to create a distortion which will impede the movement of the drawer into and out of the casing.

This problem has been solved by various reinforcing members and modifications thereof as shown in my Patent No. 2,118,011 and in my Patents Nos. 2,233,906; 2,246,966; 2,245,026.

In these various patents, it was pointed out that the application of reinforcing members, particularly to the open front of the casing in such a manner as to carry the compressive load from casing to casing through the stack, prevented collapse of the open front of the casing and thereby prevented any interference with the smooth operation of the drawer therein.

While the commercial structures manufactured in accordance with the foregoing patents comprised reinforcements made substantially of metal, nevertheless, as suggested in said patents, the reinforcing structures were not necessarily limited to metallic material.

As also pointed out in my Patents Nos. 2,233,906 and 2,200,319, and in my application Serial No. 417,216 and Patent No. 2,319,283, the smooth operation of the drawer within the casing was greatly facilitated by friction reducing devices consisting of track and roller arrangements.

As previously mentioned, all of these reinforcing and friction reducing elements as well as interlock elements shown in my Patent No. 2,245,026 have previously, for the most part, been made of metal as that was the material most readily adapted both as to strength and lightness to produce a relatively thin structure which would not interfere with collapse of the casing.

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Owing however to conditions which restrict the availability of metallic members for reinforcement and owing to the necessity for continuing the manufacture of collapsible file cabinets made of non-metallic materials, it has now been necessary to devise reinforcing and friction reducing structure which utilizes a minimum of metal or perhaps no metal at all.

The principal difficulty which arises in the substitution of other materials for metal in casing and drawer structures of this type is that in order to obtain the requisite structural strength, additional thickness may be required. This problem has however been solved as shown in my Patents 2,118,011 and 2,233,906 which show how rabbeted metal members or members of other material may be used when the thickness thereof does not interfere with collapse.

These substitutions however have presented new problems and opportunities with respect to friction reducing elements, interlocking elements, rigidifying elements and structures and other accessories.

An object of my invention therefore is the provision of structural supporting elements for collapsible casings and drawers and combinations thereof.

An important object of my invention is the formation of friction reducing devices primarily from non-metallic materials and the securement thereof to the cooperating casing and drawer structure in such a manner as not to interfere with collapsibility thereof.

An additional object of my invention is the arrangement of various interlocking members for interengaging the reinforcing structure of vertically and horizontally adjacent cabinets in order to lock the same in stacked formation.

These and many other objects of my invention will in part be apparent and where not apparent will be pointed out in the following description and drawings, in which:

Figure 1 is a view in perspective of the lower horizontal reinforcing member showing the friction reducing device on the casing.

Figures 2, 3, 4 and 5 are views in perspective showing the various parts of the lower horizontal reinforcing member of Figure 1.

Figure 6 is a cross-sectional view taken on line

6—6 of Figure 5 looking in the direction of the arrows.

Figure 7 is a section of a modified version of the friction reducing device.

Referring now to Figures 1–5, I have here shown one way of adapting the lower reinforcing member to carry roller members. In Figure 1 it will be seen that the reinforcing member 70 is provided with a plurality of rollers 80, which are rotatable on the common axle 81. Referring to Figure 2, the lower reinforcing member 70 is provided with a plurality of coaxial longitudinal grooves 82 spaced apart by wells 83. Each of the wells 83 is of a width and length to receive a roller 80 and permit the same to rotate freely therein.

Accordingly, the depth of each of these wells should be at least greater than a radius of the roller. Preferably they should be somewhat deeper in order to accommodate for any individual variations which may occur during use of the rollers. Where desired, full holes or cut-outs extending through the member 70 may be provided to ensure clearance for large rollers and registering openings may even be provided in the bottom of the container further to ensure clearance.

In the form shown in Figures 1–5, three rollers 80, each having a longitudinal opening 85 therein, are threaded on the continuous axle 81 and are spaced apart thereon by distances equal to the length of the central grooves 82, 82 between the wells 83. The axle is then placed in the grooves 82 while at the same time the rollers are adjusted so that they each enter their respective wells 83. The axle 81 is then secured in place in the grooves 82 in any suitable manner, preferably by adhesive, though staples or any other suitable securing means may be used.

Obviously each of the rollers 80 may have an individual axle instead of the common axle 81, which individual axle may be secured in the same manner without departing from the principle of my invention.

The grooves 82 are preferably although not necessarily of such depth that the axle 81 is completely or almost completely embedded therein so that virtually the only projections from the upper surface of the lower horizontal reinforcing member 70 are the roller elements 80. The roller elements are freely rotatable on the axle and hence can cooperate with any suitable track member on the lower surface of the drawer.

While in ordinary commercial embodiments of the above structure it has been found feasible to utilize a simple longitudinal bore in each of the rollers 80, I have also found however that where the bore is of the form 90 shown in Figure 6, improved results are achieved. The bore 90 it will be seen from the cross-sectional view of Figure 6 is formed primarily from two conical perforations which meet at the center of the roller 80. The section of the interior of the roller 81 where they meet is not sharp, but rounded off so that each of the rollers may tilt independently to accommodate for any variations in the depth of the tracks with which they cooperate. This formation also provides for less friction between the roller and the axle.

I have found also in commercial embodiments that the rollers and axle may consist of wood and owing to the large bearing surfaces provided need not necessarily consist of a hard wood material, although this is preferred. In any case, the use of the double conical longitudinal perforation 90 of Figure 6 serves to prevent any jamming of the rollers on the axle and provides a means for cleaning out the interior of the roller should any foreign material lodge therein and jam the same.

Also the wider end openings of the longitudinal bore 90 of Figure 6 facilitates the waxing or oiling of the interior bearing surfaces of the rollers where that is necessary. And, in order to ensure that the wax is carried inwardly to the point where the roller actually bears on the axle, the interior bore 90 may be threaded inwardly from each end as at 92, 92 to provide a conveyor means for carrying the oil or wax inwardly to the bearing surface. If desired, the axle may be thus threaded or grooved inwardly from each end of the roller, see Figure 7. Thus in Figure 7 roller 100 has a smooth internal surface while axle 102 is provided with threaded portions 104 and 106 which are of opposite thread as indicated within the roller openings.

In the foregoing, I have set forth my invention in connection with only preferred embodiments thereof. Many variations in the formation of the various elements and in the adaptation thereof to various collapsible structures should now be clear to those skilled in the art. I therefore prefer to be bound not by the specific descriptions herein set forth, but only by the appended claims.

I claim:

1. A roller adapted to be rotatably mounted on an axle; said roller having a central opening; said opening being wider at its outer ends and narrower in the center of said roller; said opening being threaded.

2. A roller adapted to be rotatably mounted on an axle; said roller having a central opening; said opening being wider at its outer ends and narrower in the center of said roller; said opening being threaded; the threads from each end to the center being in opposite directions.

3. A roller rotatably mounted on an axle; said roller having a central opening; said opening being threaded; the threads from each end to the center being in opposite directions, the roller having bearing contact on the axle at a portion intermediate the threads.

4. A roller rotatably mounted on an axle; said roller having a central opening; said axle being spirally grooved at the portion thereof within the roller opening.

5. A roller rotatably mounted on an axle; said roller having a central opening; said axle being spirally grooved at the portion thereof within the roller opening; said spiral groove comprising two sections extending from portions of the axle adjacent opposite ends of the roller to the center thereof; said sections being spiral in opposite directions.

6. In a device of the class described, a bearing support plate having a plurality of axially aligned roller accommodating wells axially joined by axle accommodating grooves, so as to form a continuous channel therethrough for reception of an axle, an axle in said channel, and a roller loosely mounted on said axle and wholly supported thereby in each of said wells.

7. In a device of the class described, a roller member having openings therein of predetermined taper, said tapered openings terminating in a substantially cylindrical bore of substantial length and being wider at their outer ends than at the junction with said bore, an axle member fitting loosely through said bore whereby said roller member is entirely supported on said axle member and may tilt with respect to said axle member to an extent limited by the degree of taper of said openings, said axle member having extending

ends, and a support housing accommodating said ends and receiving the entire stress on said roller member.

8. In a device as set forth in claim 7, including thread means intermediate said axle member and said tapered openings on one of said members.

9. In a device as set forth in claim 7, including thread means intermediate said axle member and said tapered openings, said thread means being spiraled in opposite directions in respective openings on one of said members.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
450,004	Daley	Apr. 7, 1891
1,177,217	Taylor	Mar. 28, 1916

FOREIGN PATENTS

Number	Country	Date
181,316	Great Britain	1921
181,156	Great Britain	June 15, 1922