Aug. 17, 1965 R. H. REISS, SR., ETAL 3,201,187

DRAWER BACK BEARING

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Fig. 2.

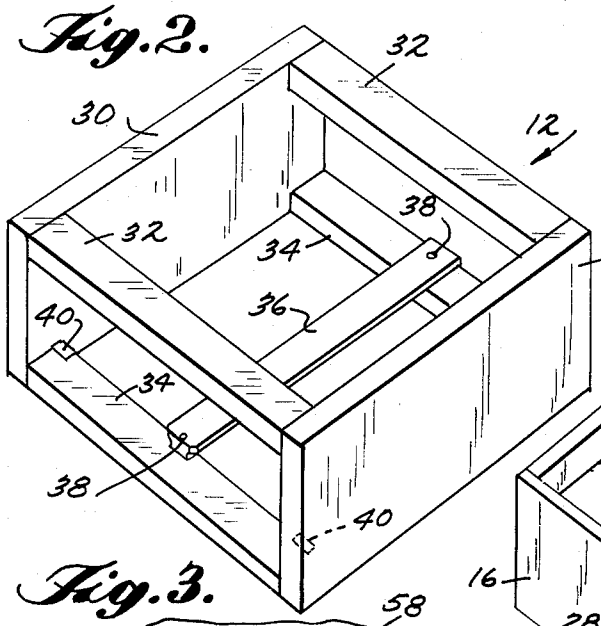


Fig. 1.

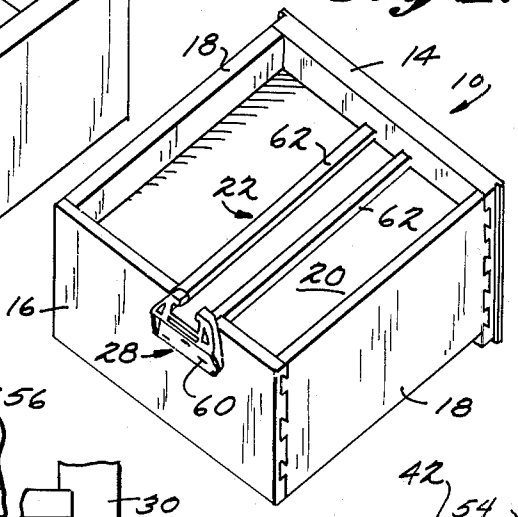


Fig. 3.

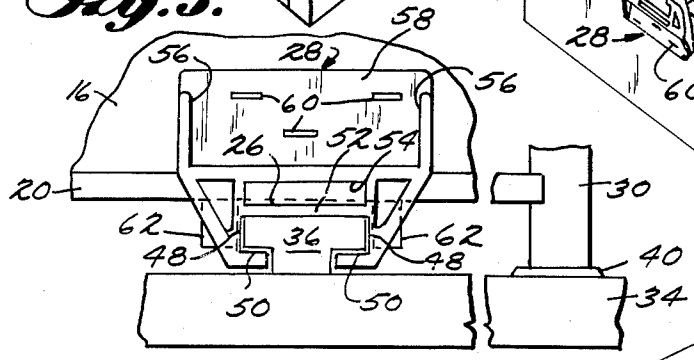
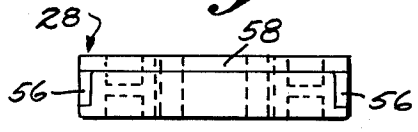


Fig. 5.



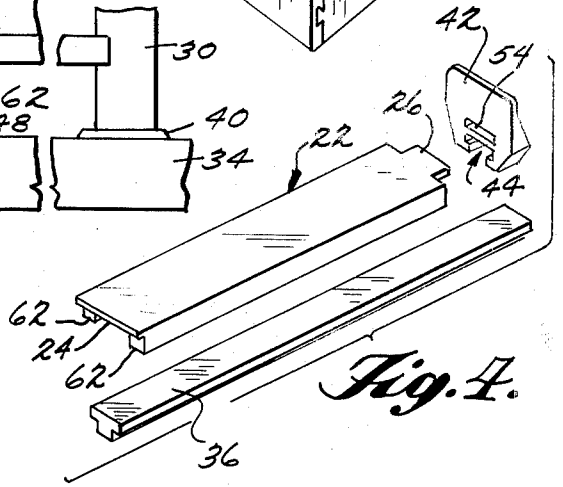
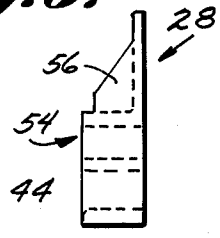


Fig. 4.

Fig. 6.



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3,201,187

DRAWER BACK BEARING

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This invention relates to a sliding drawer construction of the type used in furniture and in particular to an improved drawer back bearing construction which slidably supports the rear of a drawer on a fixed guide rail.

The principal difficulty encountered in the manufacture and utilization of sliding drawers is to achieve a support and aligning arrangement which is smooth and quiet in operation, long-lasting and economical to construct and maintain.

One conventional type of construction includes a guide rail fixed to the frame of the piece of furniture and disposed immediately below a drawer bottom and a complementary guide structure attached to and depending from the drawer so as to be guided by the fixed rail when the drawer is opened or closed. The complementary guide structure may take a number of different forms such as an elongated guide secured to the bottom surface of the drawer bottom and/or a so-called back bearing which is secured to the rear surface of the vertical back wall of the drawer and which has a depending self-lubricating portion which cooperates with the fixed guide rail.

One of the problems associated with assembling the latter type of construction is the accurate positioning of the back bearing to the drawer in the precise location necessary to achieve a smoothly operating sliding support and proper alignment of the coacting parts. These systems require rather close tolerances if all the advantages of the back bearing are to be realized, and it will be appreciated that in large scale production considerable time can be consumed in accurately positioning the bearings on the ordinarily smooth rear drawer wall.

Accordingly, it is the primary object of the present invention to provide an improved self-lubricating back bearing construction which assures positive predetermined sliding contact between the bearing and a fixed guide rail.

It is a further object to provide a back bearing and drawer arrangement in which a rearward projection on the drawer cooperates with a complementary slot or cavity in the back bearing so as to positively and accurately position the latter for optimum service.

It is another object to provide a back bearing and drawer arrangement of the aforesaid type in which the accurate positioning of the bearing permits close spacing between vertical surfaces of the bearings and the fixed guide rail so that side movement of the rear of the drawer does not effect any engagement of non-lubricated surfaces.

It is a further object to provide a back bearing of integral, molded self-lubricating material which is economical to fabricate and which is adapted by virtue of its shape to be readily and accurately positioned on the rear wall of a drawer.

It is a still further object of the present invention to provide a back bearing of the aforesaid type in which the portions which are engageable with a fixed guide rail have lateral slippery bearing surfaces to sideguide the load at the back of the drawer.

These and other objects and advantages will be apparent from the following detailed description taken with the drawing in which:

FIGURE 1 is a perspective view of the bottom of a drawer constructed in accordance with the principles of the present invention;

FIGURE 2 is a perspective view of a drawer-receiving opening in a piece of furniture;

FIGURE 3 is a fragmentary elevational view of the rear of the drawer of FIGURE 1 in a piece of furniture;

FIGURE 4 is an exploded view showing the relationship of the essential parts of the invention;

FIGURE 5 is a top plan view of the back bearing shown in FIGURES 1, 2 and 3; and

FIGURE 6 is a side elevational view of the back bearing.

Referring to the drawing, FIGURES 1 and 2 illustrate the general arrangement of a drawer 10 and a piece of furniture 12 having a drawer compartment therein. In FIGURE 1 the drawer 10 is illustrated upside down for clarity and, as is conventional, includes a front wall 14, a back wall 16, two parallel side walls 18 and a bottom wall 20 which is fitted into appropriate grooves in the other walls.

A rigid guide member 22 in the form of a channel member extends along the center line of the bottom wall 20 between the front and rear walls 14 and 16. The rear end of the guide member 22 is flush with the rear surface of the drawer rear wall 16, a portion of the wall 16 having been cut out to permit this arrangement. The guide member 22 is secured in place at its forward end by means of a forwardly extending lip 24 (FIGURE 4) which fits tightly between the bottom wall 20 and the wall of the groove in the rear face of the front wall. The rear end of the guide member is supported by a rearwardly extending tongue 26 (FIGURE 4) which fits tightly into a slot in a plastic back bearing 28 secured to the rear face of the rear drawer wall 16.

As shown in FIGURE 2, the piece of furniture 10 includes a back wall 29 and parallel side walls 30 which are spaced apart by suitable horizontal frame members 32, 34 to form a drawer-receiving compartment. Extending along the midline of the compartment bottom is a T-shaped guide rail 36 secured at its ends to the frame members 34 as with countersunk screws 38. The upper surface of each end of the forward frame member 34 is provided with a small anti-friction wear block 40 each of which is engaged by the lower surface of one of the drawer side walls 18.

As seen in FIGURES 3, 5 and 6, the back bearing 28 is an integrally molded member of anti-friction plastic such as polyethylene or nylon. The member is generally plate-like in shape and has a flat side 42 which in the completed assembly is secured to the rear face of the drawer rear wall 16. The lower portion of the bearing 28 is of greater thickness than the upper portion and is formed with a T-shaped groove 44 extending transversely to the plane of the member from the flat side 42 to the opposite side. The groove 44 has an elongated horizontal upper surface 46 for engagement with the top of the T-shaped guide rail 36 and two short depending surfaces 48 for engagement with the sides of the guide rail 36. The depending surfaces intersect two short horizontal surfaces 50 which will engage the bottom of the guide rails when the front of the drawer tips downwardly as it is pulled outwardly from the compartment.

Directly above the horizontal surface 46 and separated therefrom by a horizontal rib 52 is a horizontal rectangular slot 54, the dimensions of which are such as to form a tight fit over the tongue 26 on the guide member 22. A pair of ribs 56 extend upwardly along the lateral edges of the bearing to reinforce the relatively thin upper portion 58 of the bearing through which staples 60 or other securing means may be passed.

One of the features of the invention is the ease and accuracy with which the back bearing may be located and secured to the drawer construction during assembly. As pointed out above, a back bearing must be precisely located if it is to effect proper sliding support for the drawer

and much time has heretofore been used in this operation. According to the invention, the back bearing 28 is used in combination with a guide member which automatically locates the bearing in its exact proper position when the tongue 26 is forced into the slot 54 in the bearing. For example, the assembly of the guide member 22 and the bearing 28 on the drawer 10 is accomplished by first forcing the forward lip 24 of the guide member between the bottom drawer wall 20 and the groove in the front drawer wall 14. At this point the rear end of the guide member 22 is flush with the rear face of the rear drawer wall with the tongue 26 projecting slightly beyond. The bearing 28 is then attached to the guide member 22 by forcing the slot 54 over the tongue 26 to accurately locate the groove 44 with respect to the channel formed by the guide member 22. The upper portion 58 of the bearing 28 may then be secured to the rear drawer wall 16 as with staples 60.

Another feature of the invention concerns the relationship between the dimensions of the groove 44 in the bearing 28 and the dimensions of the channel formed by the guide member. This is shown most clearly in FIGURE 3 wherein it is seen that the distance between the vertical surfaces 48 of the bearing 28 is slightly less than the distance between the walls of the channel formed by depending ribs 62 on the guide member. The purpose of this feature is to assure that a slippery bearing surface is brought into engagement with the fixed guide rail when the back of the drawer move laterally. Thus, the ribs 62 of the guide member 22 do not engage the guide rail 36 except at the front end of the latter. While the exact difference in the dimensions may vary, it has been found that the width between the vertical bearing surfaces 48 should be about 1/8 inch less than the distance between the ribs 62 on the guide member 22. This provides a 1/64 inch thickness of plastic for engagement with the sides of the fixed guide rail. It will be appreciated that this small difference in width necessitates a very accurate positioning of the bearing 28 with respect to the guide member 22.

Referring further to FIGURES 3 and 4, it will be seen that the tongue 26 on the guide member 22 is an integral extension of the web portion of the member 22. In the arrangement illustrated, the guide member is constructed of wood, and it is thus a very simple matter to form the tongue in this manner. The guide member 22 need not be constructed of wood, but in the interest of economy and by preference manufacturers often use wood for both the male and female elements of drawer guide systems.

A further feature of the invention is the use of a T-shaped groove in the bearing in combination with the T-shaped fixed guide rail 36 and the open channel-shaped guide member 22. As seen in FIGURE 3, the rear of the drawer 10 is normally supported solely by engagement of the horizontal rib 52 with the top of the wooden fixed guide rail 36, there being clearance between the horizontal bearing surfaces 50 and the lower surfaces of the rail 36.

However, when the drawer 10 is pulled outwardly to nearly its full out position, its front end tips downwardly to a slight degree. This causes the rear end of the drawer to tip slightly upwardly with the result that the surfaces 50 engage the lower surface of the guide rail 36. Thus the cross bar of the T of the guide rail 36 becomes clamped between the rib 52 and the surfaces 50 of the bearing 28 so that resistance is offered to further withdrawal of the drawer 10. The person opening the drawer will feel this resistance and will thus not accidentally pull the drawer completely out of its compartment. Since the drawer 10 is supported only by the plastic rib 52 and the two plastic blocks 40, it is readily slidable and would tend to move out of its compartment by its own momentum. However, the construction of the bearing 28 prevents this without the use of any auxiliary drawer stops or other features which would add to the cost of manufacture.

Thus, it will be appreciated that the present invention, while utilizing a conventional wooden female guide on a drawer bottom and a wooden male guide fixed to the frame of the piece of furniture, provides on economical arrangement which eliminates most of the direct contact between the guides and thereby provides a more smoothly operating system. The back bearing which accomplishes this provides a horizontal bearing surface to support the load at the back of the drawer, vertical bearing surfaces to side-guide the load at the back of the drawer and further horizontal bearing surfaces to take the upward or tilting load as the drawer is pulled forward. The accurate positioning of the bearing necessary to achieve these results is assured in a simple and effective manner by providing a tongue on the rear of the female guide for engaging a complementary slot in the bearing. While an embodiment of the invention has been described and illustrated, modifications hereof are contemplated within the scope of the invention and the described details are not intended to be limiting except as they appear in the appended claims.

What is claimed is:

1. A back bearing for a slidable drawer comprising: a plate-like member having a flat side adapted to be secured to the back of a drawer, said member having a portion of substantially greater thickness than the remainder of the plate extending normal to the plane of said flat side from said flat side to the opposite side, the edge of said portion being of antifriction material and defining a channel for cooperating with a drawer guide, said member having a cavity extending from said flat side into said thickened portion, said cavity being disposed adjacent said channel in a direction toward said remainder of said member, said cavity being adapted to engage a fixed projection extending from the drawer to thereby accurately position said back bearing on the drawer.

2. A back bearing as in claim 1 wherein said cavity is rectangular in the plane of said member.

3. A back bearing as in claim 1 wherein said member is an integrally molded member of anti-friction plastic.

4. A back bearing as in claim 1 wherein said channel is T-shaped in cross section and wherein said cavity extends completely through said member and is rectangular and generally coextensive in its long dimension with the cross bar of the T.

5. A sliding drawer comprising: vertical front, rear and side walls; a horizontal bottom wall joined to said front and rear walls; an elongated guide member disposed beneath said bottom wall and extending between said front and rear walls to define guide surfaces for slidably engaging a fixed guide on a piece of furniture; a tongue projecting rearwardly from the rear end of said guide member; a back bearing disposed adjacent the rear end of said guide member and in engagement with the rear surface of said rear wall, said back bearing having a depending portion having anti-friction surfaces adjacent the rear end of said guide member for engagement with the fixed guide, said back bearing further having a cavity therein, the walls of which tightly engage said tongue to accurately position said back bearing on said rear wall in a predetermined location with respect to said elongated guide member.

6. A drawer as in claim 5 wherein said guide member is a channel-shaped member having a web portion and depending side portions and wherein said tongue is an extension of said web portion.

7. A drawer as in claim 6 wherein said guide member and tongue are wood and wherein said back bearing is an integrally molded member of anti-friction plastic.

8. A drawer as in claim 6 wherein said anti-friction surfaces are defined, at least in part, by a channel-shaped edge of said depending portion, said edge having a horizontal surface and two depending surfaces and wherein said cavity is spaced directly above said horizontal surface and is generally coextensive therewith.

9. A drawer as in claim 8 wherein said channel-shaped edge of said depending portion of said back bearing is formed by a T-shaped groove in said depending portion, said horizontal surface being defined by the top of the cross bar of the T.

10. A drawer as in claim 8 wherein said depending anti-friction surfaces are slightly more closely spaced than the side portions of said guide member whereby said depending anti-friction surfaces provide lateral bearing surfaces for the rear of said drawer.

11. A sliding drawer construction comprising: a frame having a drawer compartment; a drawer having front, side and rear walls and a bottom, said drawer being slidable in said compartment; an elongated guide rail fixed with respect to said frame and disposed below said drawer; a guide member fixed with respect to said drawer and disposed on the bottom thereof between the front and rear walls thereof, said guide member having guide surfaces which are generally complementary to said fixed guide rail; a rearwardly projecting tongue on said guide member; a back bearing fixed to the rear surface of said drawer rear wall and having a depending portion which is engageable with the fixed guide rail, the engageable surfaces of said depending portion being of anti-friction material, said back bearing having a cavity therein the surfaces of which tightly engage said projection whereby

during assembly of the drawer and back bearing said tongue accurately locates said back bearing on the rear wall of the drawer.

12. A sliding drawer construction as in claim 11 wherein said guide member is a downwardly facing channel member having a web portion and two depending sides, said tongue being formed by an extension of said web portion; wherein said fixed guide rail is T-shaped in transverse cross-section; and wherein said depending portion of said back bearing has a T-shaped groove therein for cooperating with said rail, the surfaces of said T-shaped groove being spaced slightly more closely to said rail than the surfaces of said channel-shaped guide member whereby the rear of said drawer is supported solely by anti-friction surfaces and whereby side-to-side movement of the rear of the drawer is limited by engagement of anti-friction surfaces with said guide rail.

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