United States Patent [19]

Roemer

[11] **3,825,310**

[45] **July 23, 1974**

[54] **INTERNALLY REINFORCED DRAWER GUIDE**

[75] Inventor: **Bruce W. Roemer,** Portland, Oreg.

[73] Assignee: **Barker Manufacturing Company,** Portland, Oreg.

[22] Filed: **Mar. 1, 1973**

[21] Appl. No.: **337,072**

[52] **U.S. Cl.** ..... **308/3.6,** 312/341 NR, 312/330

[51] **Int. Cl.** **F16c 21/00**

[58] **Field of Search** ..... 308/3.8, 3.6; 312/342, 312/343, 344, 345, 346, 347, 330, 341 NR

[56] **References Cited**

UNITED STATES PATENTS

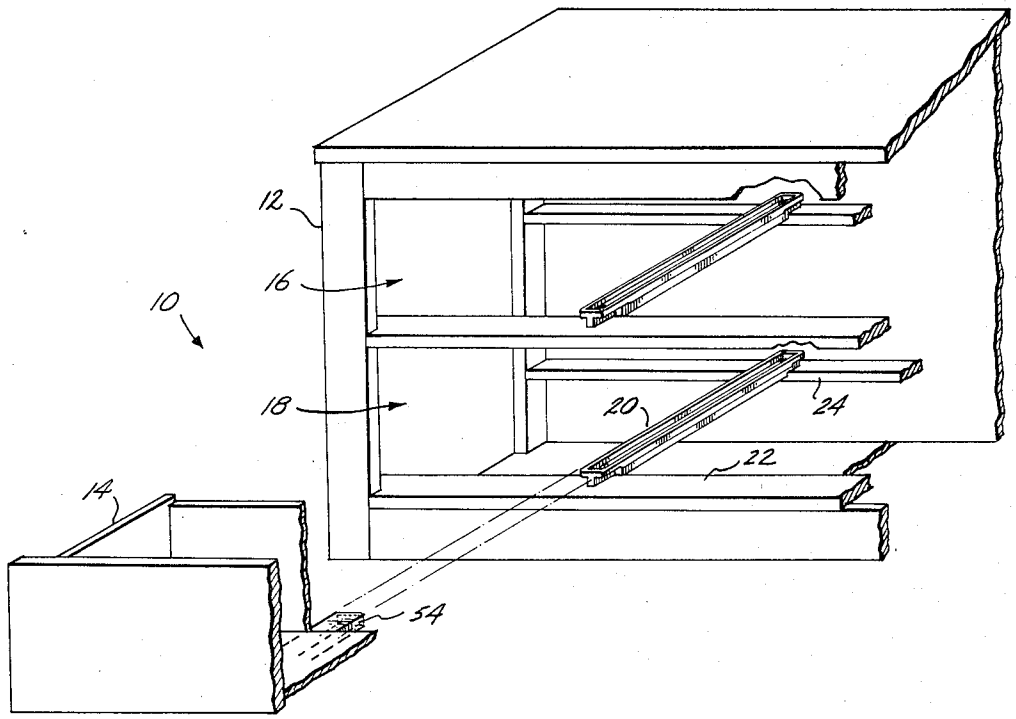
3,059,986	10/1962	Miller	308/3.6
3,112,969	12/1963	Gustafson	312/330
3,363,960	1/1968	Reiss et al	308/3.6
3,653,735	4/1972	Duepree	312/330

Primary Examiner—Charles J. Myhre
Assistant Examiner—R. H. Lazarus
Attorney, Agent, or Firm—Kolisch, Hartwell & Dickinson

[57] **ABSTRACT**

An internally reinforced, molded plastic drawer guide for chests using center-guide construction. A guide having balanced strength and stiffness is produced by distributing glass fibers substantially uniformaly throughout the body of the guide, including regions spanning the joinder of the body's component parts.

4 Claims, 4 Drawing Figures



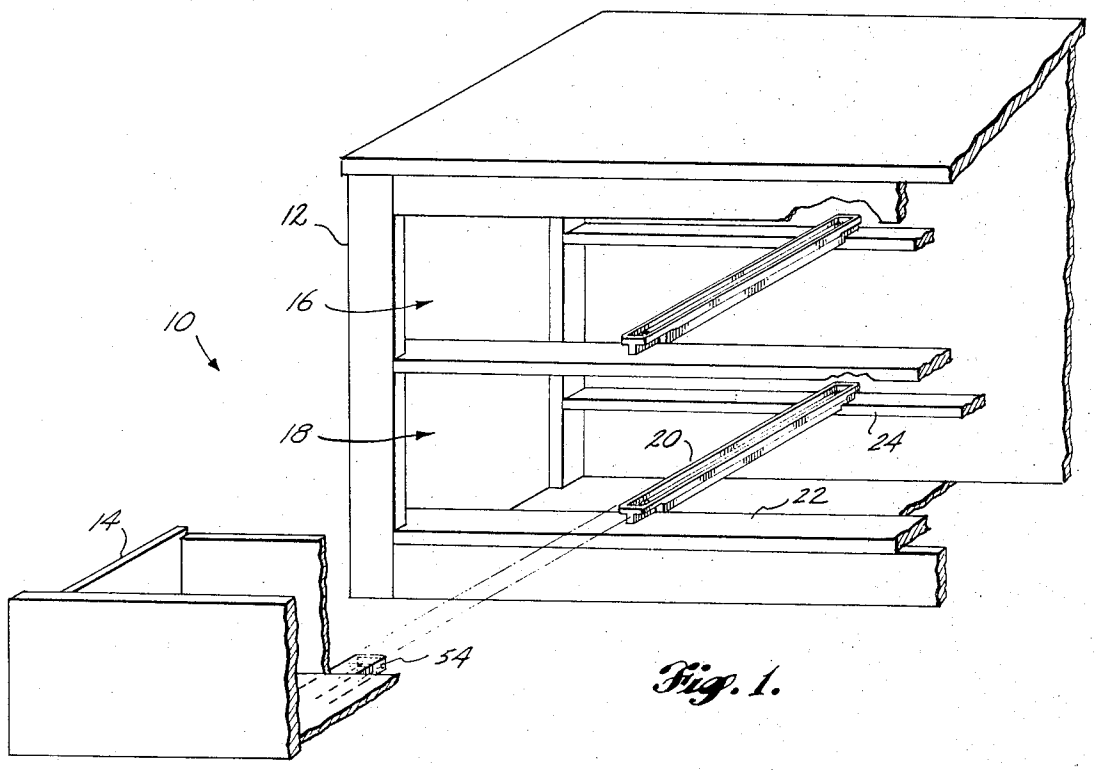


Fig. 1.

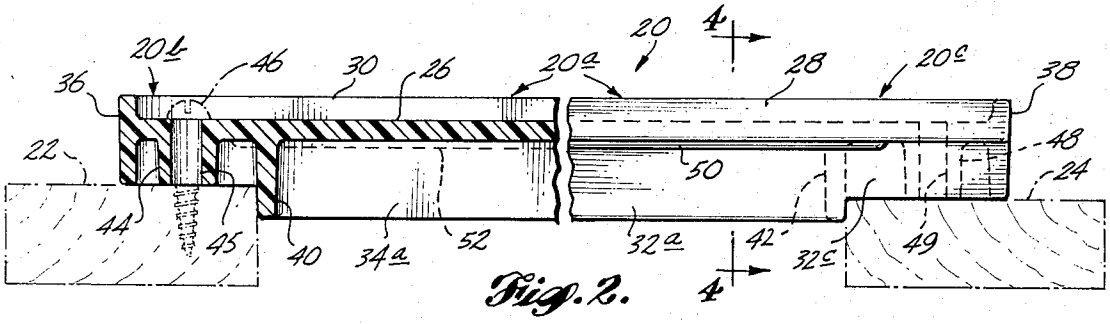


Fig. 2.

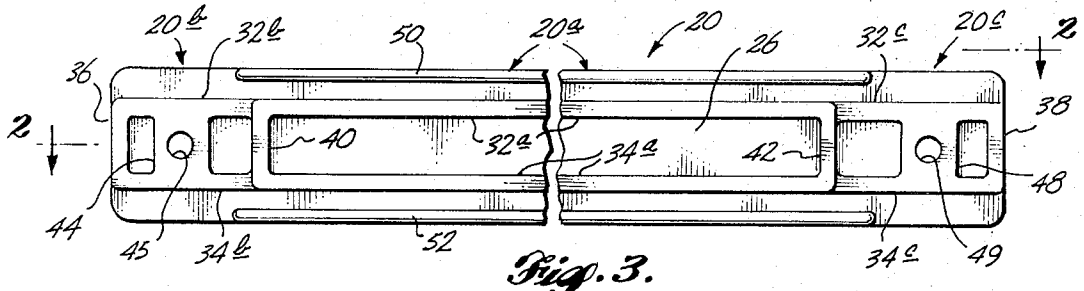


Fig. 3.

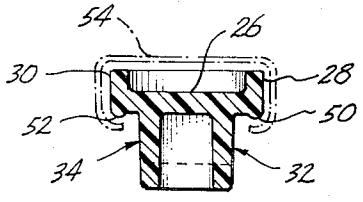


Fig. 4.

INTERNALLY REINFORCED DRAWER GUIDE

BACKGROUND AND SUMMARY OF THE INVENTION

The invention relates to a drawer guide, and more particularly to a strong, lightweight molded plastic drawer guide having an internally reinforced structure.

Drawer guides of the general type contemplated by the invention are widely used in chests of drawers having so-called center guide construction. In the past, such guides have been constructed principally of wood; however, metal center guides have also been used.

Although a drawer guide is a relatively simple structure, it must satisfy a number of requirements in order to satisfactorily perform its function. For one, the guide must be strong enough to support the full weight of a drawer and its contents. In addition, the guide must have sufficient stiffness to resist deflecting excessively under load, since that could cause binding or other difficulties in opening and closing the drawer. Further, because portions of the drawer assembly slide or roll along the guide as the drawer is pushed in or pulled out, the guide should be smooth and have a low friction characteristic. Still further, since drawer guides are used in very large quantities by a highly competitive industry, they should be capable of being readily produced in large quantity at low cost.

A general object of the present invention, therefore, is to provide a drawer guide which meets the above-identified needs in a practical and satisfactory manner.

BRIEF DESCRIPTION OF THE DRAWINGS

Other more specific objects and advantages of the novel drawer guide of the invention will become more apparent as the description which follows is read in conjunction with the accompanying drawings, wherein:

FIG. 1 is a fragmentary perspective view of a chest and an associated drawer, illustrating the use of the novel drawer guide;

FIG. 2 is a side view, partially in section of a drawer guide, showing mounting detail;

FIG. 3 is a bottom plan view of the drawer guide of FIG. 2; and

FIG. 4 is a transverse cross section of the guide taken on line 4—4 of FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

Turning now to the drawings, illustrated in FIG. 1 are portions of a chest of drawers **10** incorporating center drawer guides according to the invention. Chest **10** includes a cabinet **12** designed to accommodate a pair of drawers, with a portion of one such drawer, lower drawer **14**, shown removed from the cabinet. Cabinet **12** includes upper and lower drawer-receiving chambers **16, 18**, respectively. Since, in the cabinet illustrated, chambers **16** and **18** are identical in all essential respects, the description following will, for brevity, be addressed to chamber **18** alone, but apply equally to both.

Mounted adjacent the bottom of chamber **18** on front and rear cabinet cross-members **22, 24** respectively, is an elongate drawer guide **20**. As will be appreciated, guide **20** is disposed substantially normal to the cross-members about midway between the ends of the chamber. Referring to FIGS. **2–4**, drawer guide **20** has a unitary body comprising an elongate intermediate portion **20***a* and a pair of mounting or end portions **20***b*, **20***c* integrally joined to either end of the intermediate portion. An elongate, generally horizontally disposed central web **26** extends substantially the length of the guide body. Integral with the web and extending the length of either side thereof are a pair of upstanding side rails **28, 30**. Also extending the length of web **26** are a pair of laterally spaced, depending flanges **32, 34** (FIG. **4**), integrally joined to the web laterally inward of side rails **28, 30** respectively. Web **26**, side rails **28, 30** and flanges **32, 34** mutually terminate at end walls **36, 38** of end portions **20***b*, **20***c* respectively.

Referring now to FIGS. **2** and **3**, flanges **32, 34** each include intermediate portions **32***a*, **34***a* respectively, extending the length of intermediate guide portion **20***a*. Portions **32***a*, **34***a* are joined at either end by connecting walls **40, 42** adjoining each end portion of the guide. Flanges **32, 34** also include end portions extending substantially the length of the guide's end portions. Thus, end portions **32***b*, **34***b* of the flanges extend along guide portion **20***b* between connecting wall **40** and end wall **36.** In like manner, flange end portions **32***c*, **34***c* extend along guide portion **20***c* between connecting wall **42** and end wall **38.** Connecting flange portions **32***b*, **34***b* intermediate walls **36, 40** is a connector block **44.** Block **44** has a bore **45** therein to accommodate an attaching device or fastener such as a screw **46** (FIG. **2**). Similarly, end portions **32***c*, **34***c* are connected through connector block **48** having a bore **49** therein.

Referring again to FIGS. **2–4**, drawer guide **20** further includes a pair of elongate ribs or beads **50, 52** depending from side rails **28, 30,** respectively. Beads **50, 52** extend along the guide body on either side, terminating, as shown in FIGS. **2** and **3**, at locations generally intermediate the connecting walls and connector blocks.

As best shown in FIG. **2**, the end portions of the guide body are distinctly shallower than the intermediate portion. Thus, the lower margins of an end portion form, with the adjoining connecting wall, what may be thought of as an inverted shelf or seat for a cabinet cross-member. These seats adapt the end portions of the guide for supporting the intermediate portion between transversely extending, generally coplanar cabinet members, such as cross-members **22, 24.** It may be noted that the seats formed in the opposite ends of a guide need not be identical. Thus, in FIG. **2**, the seat for cross-member **24** is somewhat shallower than that for cross-member **22** to accommodate the greater thickness of member **22.**

With guide **20** mounted in cabinet **12** as shown in FIG. **1**, drawer **14** may be inserted into chamber **18.** Suitably attached to the bottom surface of drawer **14** is an elongate inverted channel member or rider **54** having the cross-sectional configuration shown in phantom outline in FIG. **4.** As drawer **14** is inserted into chamber **18**, rider **54** loosely captures the upper portion of guide **20.** As the drawer is pushed into the chamber, rider **54** "rides" along the guide, preventing misalignment between the drawer and cabinet.

As will be appreciated, as a drawer is inserted into or withdrawn from the cabinet, the rider will not remain spaced apart from the guide as shown in the idealized

FIG. 4 view, but will slide along the guide's side rail and bead portions. It is desirable, therefore, that these portions have a smooth, low friction surface. This is provided in the drawer guide of the invention by molding the guide from a suitable plastic composition such as a polystyrene composition.

As pointed out above, a drawer guide for a cabinet employing center-guide contruction must be both stiff and strong, since a large portion of the weight of a drawer and its contents is carried by the guide. Obviously, the guide must be strong enough to support the weight of a fully loaded drawer in any position between fully inserted and fully withdrawn. In addition, the guide must be stiff enough not to sag or bend excessively as the drawer is inserted or withdrawn. Too much deflection, either vertical or lateral prevents smooth insertion and withdrawal, and could cause jamming of the drawer in the cabinet chamber. To provide these qualities, glass fibers are dispersed throughout the plastic material comprising the drawer guide body. Preferably, the glass fibers are substantially uniformly dispersed throughout the body, including regions in the intermediate portion of the guide spanning the joinder of the side rails and flanges with the web. In the end portions of the guide, fibers are dispersed throughout the regions encircling the mounting bores, and spanning the joinder of the end portions with the intermediate portion. In this way, a strong, unified, internally reinforced structure is produced.

A preferred method for accomplishing the desired distribution of glass fibers throughout the body of the guide is provided by forming the part by injection molding. Thus, drawer guides meeting the requirements generally set out above are produced by forming the guides from a polystyrene composition containing a minor proportion of glass fibers using conventional injection molding equipment. As will be appreciated, the conditions under which the guides are molded depend on the particular equipment used, guide size and shape, mold design, and other factors well known to those having ordinary skill in that art, and thus play no part of the invention.

The specific polystyrene composition used and the proportion of glass fibers incorporated therein depend on the particular geometry of the drawer guide and its intended use conditions. In general, however, it has not been found desirable to add more than about 10 percent by weight of glass fibers to a general purpose polystyrene composition, and with high-impact polystyrene compositions a range of about 3 to about 7 percent by weight is preferred. Greater amounts of fibers produce guides having greater stiffness but decreased strength. Guides produced with lower amounts are overly flexible.

Describing a particular manufacture by way of example, however, drawer guides having the configuration shown in the drawings are produced from a high-impact grade polystyrene composition, such as Amoco Grade H4R polystyrene resin, to which about 3 to about 7 percent by weight of glass fibers has been added. The preferred method of incorporating the glass fibers in the composition is to admix a polystyrene resin containing a high percentage of fibers, such as Fiberfil Styracon, a resin containing about 80 percent by weight long (one-half inch) glass fibers, with the high-impact resin. Thus, to obtain a high-impact composition containing about 5 percent by weight of glass fibers, 15 pounds of Grade H4R resin pellets are admixed with 1 pound of Styracon pellets. This mixture, containing in addition a suitable coloring agent, is added to the hopper of a screw-type injection molding machine.

As is generally understood, the hopper's outlet communicates with the rear end of a hollow, heated cylinder or barrel containing an elongate, rotating screw. As the polystyrene pellets flow into the barrel, they are captured by the screw and carried forward. In the heated barrel the two types of pellets melt and are mixed together to form a uniform composition. When the polystyrene composition has been heated to the desired molding temperature, about 325° to 340° F. for the particular mixture described herein, it is injected through an orifice into a mold or die for the drawer guide. The composition is preferably injected adjacent one end of the die. As the glass-containing composition flows through the guide-shaped cavity in the die, the glass fibers in the composition tend to align themselves in the direction of flow. Thus, the fibers in the intermediate portion of the guide become oriented generally in the direction of that portion's longitudinal axis as the composition flows from one end of the cavity to the other. In like manner, a portion of the fibers in the end portions become oriented around the bore-defining regions of those portions.

There is thus provided a drawer guide meeting the aboveidentified requirements in a practical and satisfactory manner. Although a preferred embodiment has been described herein, it is understood that variations and modifications are possible without departing from the spirit of the invention.

It is claimed and desired to be secured by Letters Patent

1. A drawer guide including

an elongate intermediate portion comprising an inverted U-shaped channel member having a pair of laterally outwardly projecting integral side rails disposed along the member's upper margin, said portion comprising a polystyrene composition containing a minor proportion of glass fibers dispersed throughout said channel member and side rails, and oriented generally in the direction of said portion's longitudinal axis and,

mounting portions integrally joined to the intermediate portion adjacent either end thereof and adapted for supporting the intermediate portion between transversely extending, generally coplanar cabinet members, said mounting portions each including means defining a bore therein to accommodate means for attaching the guide to a cabinet member, each of said mounting portions comprising a polystyrene composition containing a minor proportion of glass fibers dispersed therein, said fibers being distributed in regions encircling said bores and spanning the joinder of said monting portions with said intermediate portion, whereby said bore-defining means is reinforced and a strong, unified, internally reinforced structure is produced.

2. The drawer guide of claim **1,** wherein said polystyrene composition comprises a high impact polystyrene composition containing about 3 to about 7 percent by weight of glass fiber.

3. A unitary, internally reinforced drawer guide comprising

an elongate intermediate portion including a pair of laterally spaced upstanding side rails integrally joined along their opposing lower margins by a horizontally disposed central web, and a pair of substantially vertically depending, laterally spaced flanges integrally joined to said web laterally inward of said side rails, said intermediate portion comprising a polystyrene composition having about 3 to about 10 percent by weight of glass fibers substantially uniformly dispersed therein including regions spanning the joinder of said rails and flanges with said web thus to reinforce said intermediate portion, and

a pair of mounting portions integrally joined to said intermediate portion adjacent either end thereof, each portion including means defining a bore therein to accommodate attaching means, said mounting portions comprising a polystyrene composition having about 3 to about 10 percent by weight of glass fibers substantially uniformly dispersed therein including regions encircling said bores and spanning the joinder of said mounting portions with said intermediate portion, whereby a strong, unitary, internally reinforced drawer guide is produced.

4. The drawer guide of claim **3,** wherein said polystyrene composition comprises a high impact polystyrene composition containing about 3 to about 7 percent by weight of glass fiber.

* * * * *