United States Patent [19]

Kaplan et al.

[11] **3,897,981**

[45] **Aug. 5, 1975**

[54] **PLASTIC GUIDE FOR DRAWER**

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[73] Assignee: **Kenneth H. Gutner**, Highland Park, Ill.

[22] Filed: **Jan. 16, 1974**

[21] Appl. No.: **433,908**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 372,228, June 21, 1973, Pat. No. 3,846,001.

[52] **U.S. Cl.** ..... **308/3.6**; 308/3.8; 312/341 NR

[51] **Int. Cl.** **F16c 17/00**

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

[56] **References Cited**

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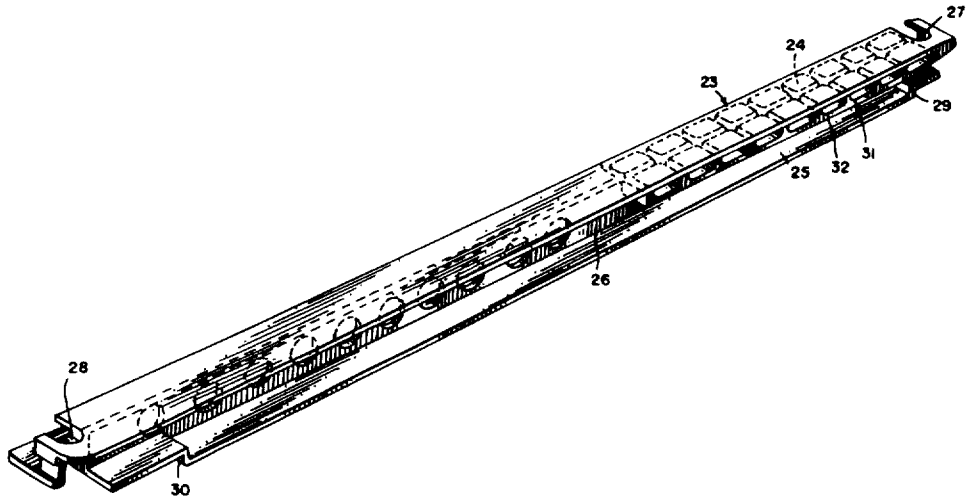
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Assistant Examiner—R. H. Lazarus
Attorney, Agent, or Firm—Dawson, Tilton, Fallon & Lungmus

[57] **ABSTRACT**

A plastic guide for a drawer, constituting the stationary element of a two-element slide-facilitating arrangement for the drawer of a furniture piece, the guide having upper and lower integral horizontally extending flanges integrated by a vertically extending web to define a generally I-shape in transverse section, the upper flange including an integral reinforcement on the underside thereof extending partway along the length of the upper flange from the forward end portion of the guide.

2 Claims, 16 Drawing Figures



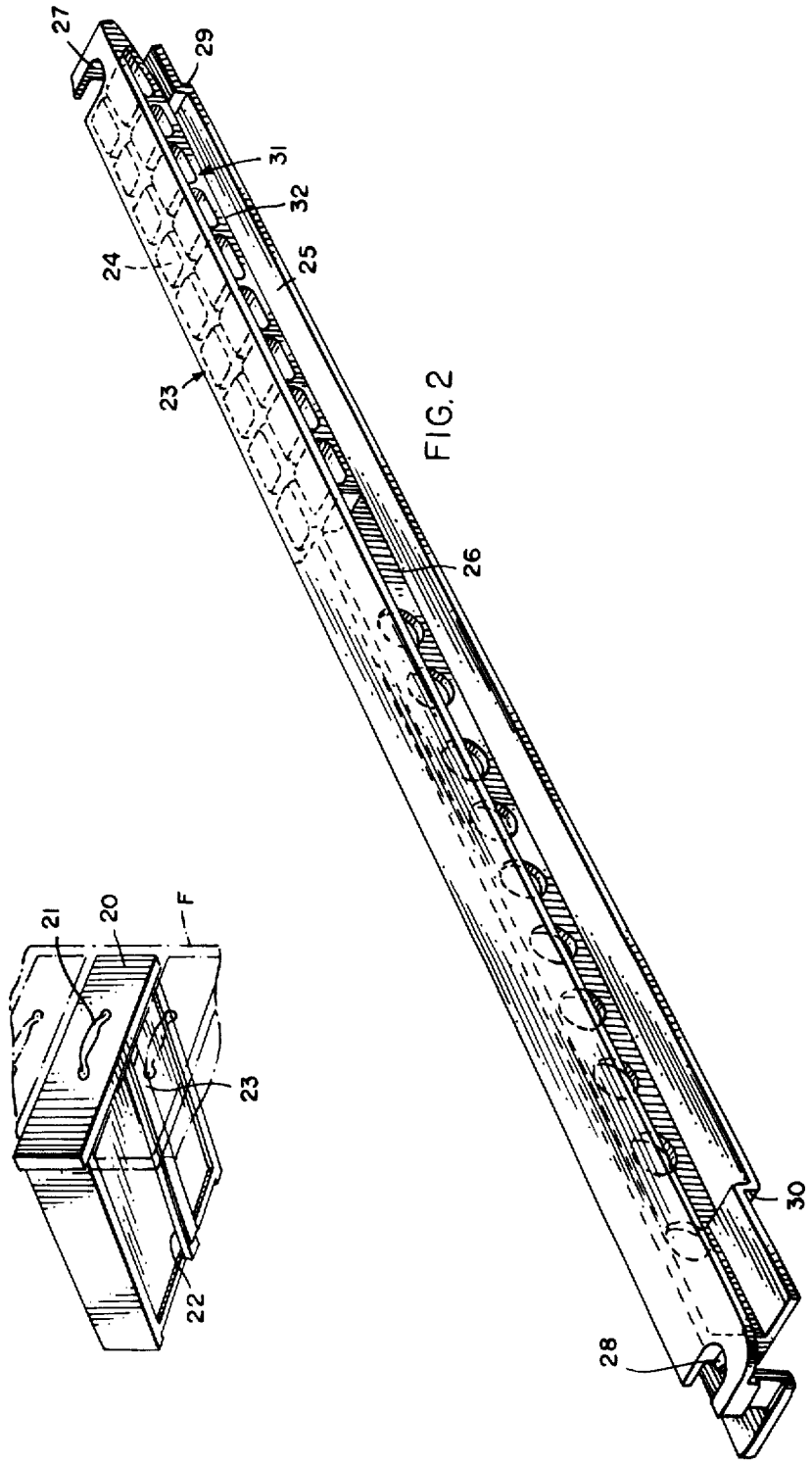


FIG. 2

FIG. 1

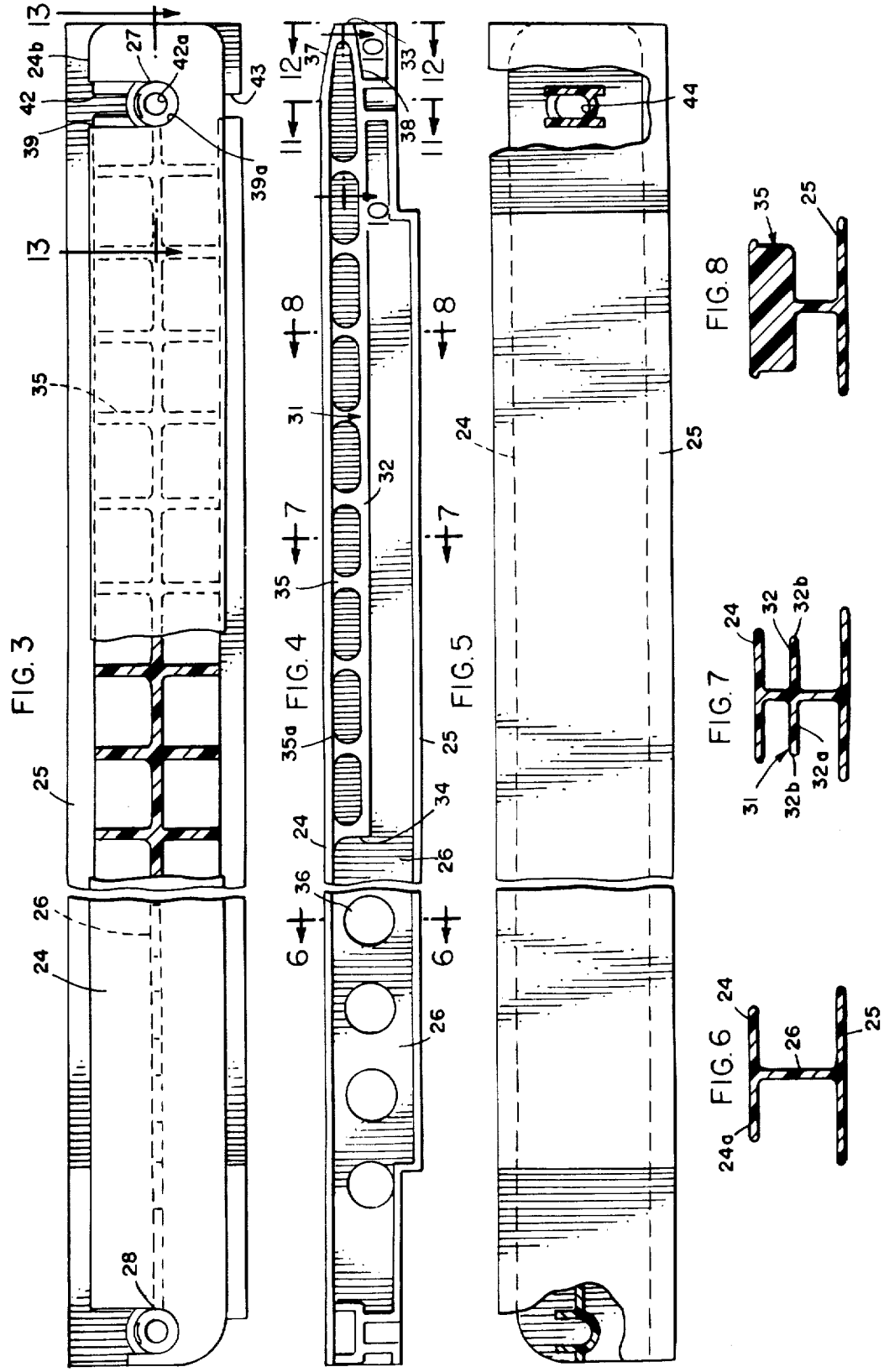

FIG. 3
FIG. 4
FIG. 5
FIG. 6
FIG. 7
FIG. 8

FIG. 9

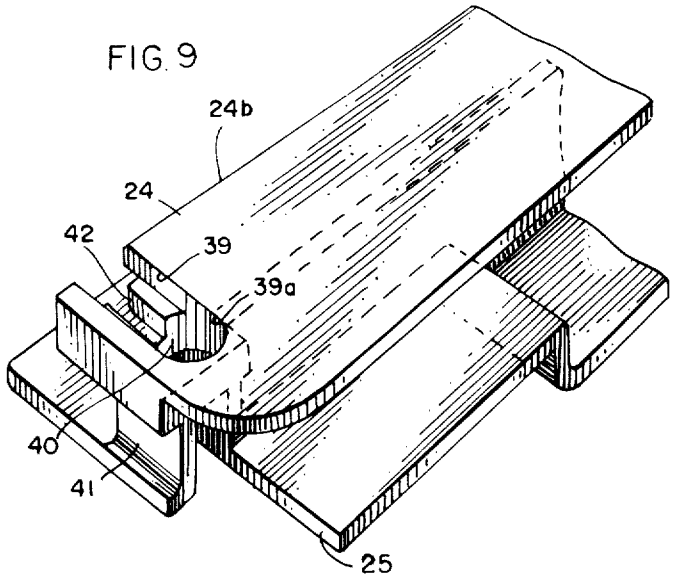


FIG. 10

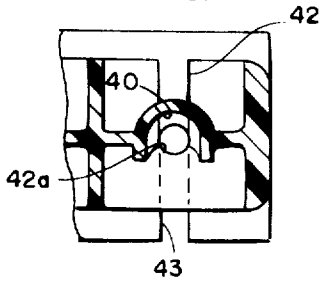


FIG. 11

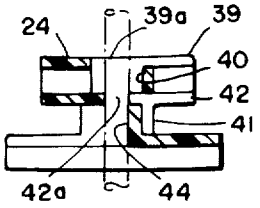


FIG. 12

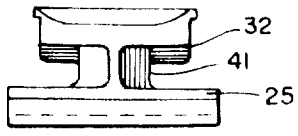
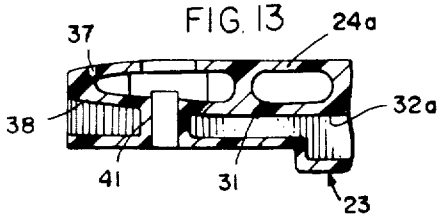


FIG. 13



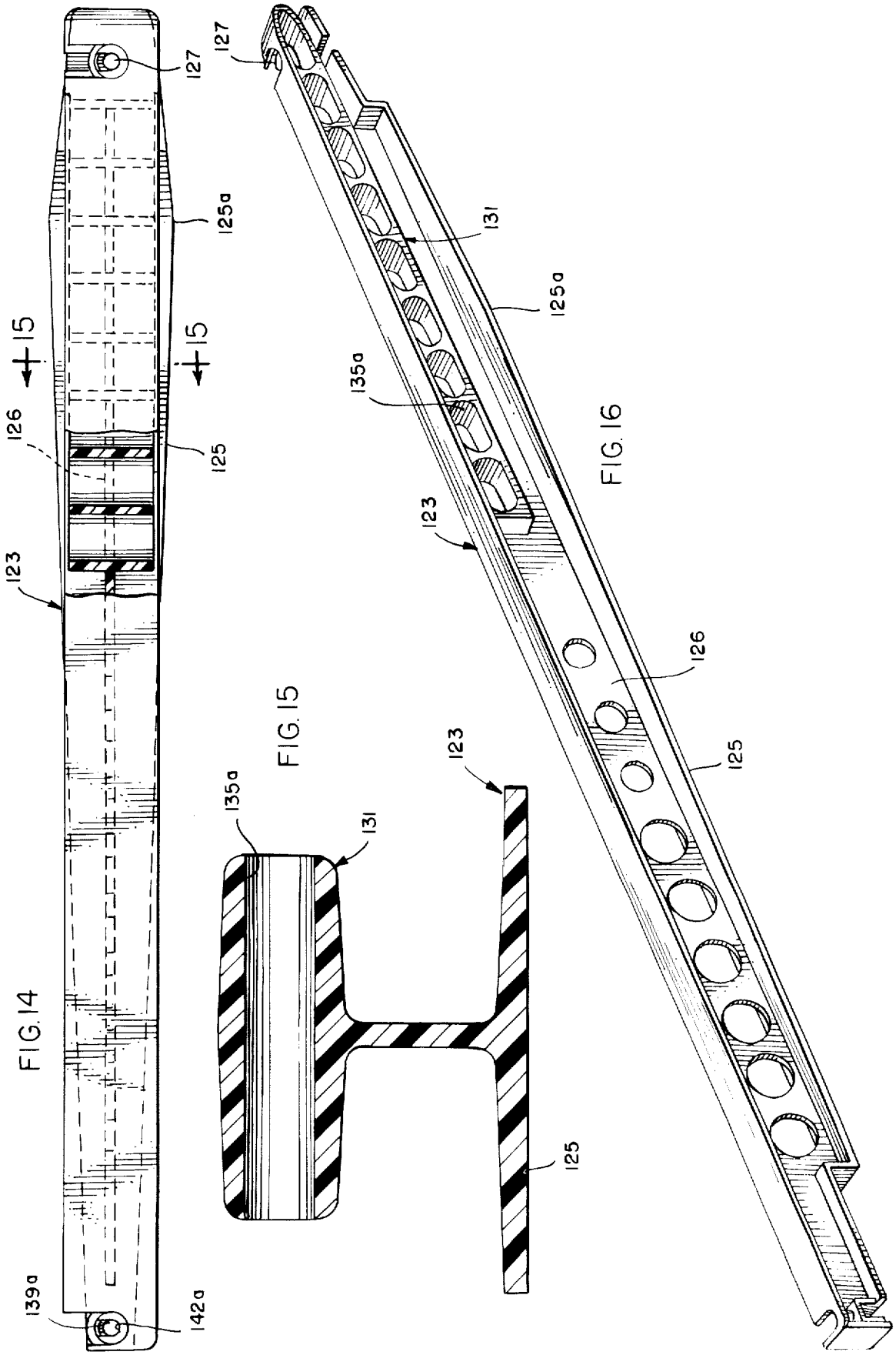


FIG. 14

FIG. 15

FIG. 16

PLASTIC GUIDE FOR DRAWER

This is a continuation-in-part of our copending application Ser. No. **372,228**, filed June **21, 1973** now U.S. Pat. No. **3,846,001.**

BACKGROUND AND SUMMARY OF INVENTION

Historically, drawer guides have been constructed of wood and have had a T-shape or H-shape in transverse section. The guides are normally secured to the front and rear parting rails of a furniture piece such as a dresser, night stand, etc. The flange of the T-shape is engaged by a slide member secured to the underside of the drawer and which is advantageously channel-shaped as illustrated in co-owned U.S. Pat. No. **3,328,107.**

The heretofore employed wood guides have suffered from a number of drawbacks. Because the wood could swell due to changes in climate, an unduly large tolerance or clearance had to be allowed to insure basic workability, i.e., proper sliding relation between the drawer slide and furniture guide. This naturally resulted in poor operation when the swelling was minimal. Further, to achieve desirable operation, sanding had to be performed on the wood which raised the cost significantly. Yet further, the wood guides had to be equipped with screw openings at the ends thereof (for securement of the guide to the parting rails) which, if not performed with a good deal of care, could result in splitting of the guide and total loss thereof.

Attempts have been made to employ other materials of construction for the wood guides. For example, plastic guides have been provided which approximate the shape of the previously employed wood guides. To make these plastic guides reasonably competitive with the wood guides, it was necessary to substantially reduce the amount of material which resulted in problems of undue flexure. Any attempt to minimize the flexural problems resulted in an unduly expensive guide — from the standpoint of the quality and quantity of the plastic material needed.

According to the instant invention, the drawbacks of the previously employed wood and plastic guides are avoided. More specifically, through the use of a unique configuration (generally approximating an I-shape in transverse section) we have been able to provide a superior plastic guide. The guide is characterized by a unique integral reinforcement adjacent the forward portion of the guide, advantageously provided on the underside of the top flange. This not only minimizes any flexural problems but establishes a superior sliding relationship with the drawer slide while retaining the advantage of economy of manufacture.

Other objects and advantages of the invention can be seen in the details of construction and operation set down in the ensuing specification.

DETAILED DESCRIPTION

An illustrative embodiment of the invention is described in conjunction with the accompanying drawing, in which

FIG. **1** is a perspective view of a portion of a furniture piece equipped with a slide-equipped drawer and the inventive guide with parts partially broken away or shown in phantom to better illustrate the environment of the invention;

FIG. **2** is a perspective view, partially broken away, of the inventive guide;

FIG. **3** is a top plan view, partially broken away and in section of the guide of FIG. **2**;

FIG. **4** is a side elevational view of the guide;

FIG. **5** is a bottom elevational view of the guide, again partially broken away to show details of construction in section;

FIGS. **6, 7** and **8** are cross sectional views taken along the lines **6—6, 7—7,** and **8—8,** respectively as applied to FIG. **4**;

FIG. **9** is a perspective cut away view of one end portion of the inventive guide and showing the details of a screw-receiving hole;

FIG. **10** is a sectional view taken along the line **10—10** applied to FIG. **4**;

FIG. **11** is another sectional view of the end portion of the guide as would be seen along the sight line **11—11** applied to FIG. **4**;

FIG. **12** is a front end elevational view of the structure seen in FIG. **4**;

FIG. **13** is a longitudinal sectional view of the front end portion of the guide seen in FIG. **4**;

FIG. **14** is a top plan view partially in section of a modified form of the invention;

FIG. **15** is an enlarged sectional view taken along the line **15—15** of FIG. **14**; and

FIG. **16** is a perspective view of the embodiment of FIGS. **14–15.**

In the illustration given, and with particular reference to FIG. **1**, the numeral **20** designates a drawer provided as part of a furniture piece F (such as a dresser, nightstand, etc.) and which is equipped with a front handle as at **21.** The drawer **20** also has a slide element **22** adapted to move on a stationary guide **23** (see FIG. **2**).

The inventive guide **23** is advantageously constructed of medium impact polystyrene and normally has a length from about **10** inches to about **19** inches. As indicated, the transverse crosssection is generally of an I-shape which includes an upper flange **24** and a lower **25** integrated by a vertically extending web portion **26.** Adjacent the forward end of the guide **23** we provide a screw receiving opening **27** and adjacent the rear end another opening **28.** It will be noted that the lower flange **25** is stepped as at **29** (adjacent the forward end) and at **30** (adjacent the rear end) for properly engaging the front and rear parting rails, respectively.

As can be appreciated from a consideration of the right hand portion of FIGS. **2** and **4** and comparing these with FIGS. **6-8,** there is provided a reinforcement generally designated **31.** The reinforcement **31** is seen to include a longitudinally extending wall or rib **32** which is positioned below and integrated with the upper wall or flange **24,** but limited in extent to the front portion of the guide **23.** For example, a conventional guide may measure in length slightly over **16½** inches while the distance from the front end **33** (see FIG. **4**) to the rear **34** of the reinforcement **31** is about **7** inches. No significant advantage is gained by extending the reinforcement further rearwardly than about **50** percent of the length of the guide inasmuch as the guide is not subjected to vertical flexure until the drawer is pulled out about half its length. Further removal of the drawer changes the character of the loading so as to tend to deform the guide — as by having a downward force applied at the front end **33** and an upward force on the underside of the reinforcement **31** adjacent the rear end **34** (see FIG. **4**). Therefore, we provide the rib **32** with its under surface **32*a*** (see FIG.

7) spaced suitably below the top surface 24*a* of the flange 24 (see FIG. 6) so as to afford good sliding contact with the channel spaced slide 22. Normally the depth of the channel in the slide 22 (see FIG. 1) is of the order of somewhat in excess of three-eighth inch so that the spacing between the top flange surface 24*a* and the bottom rib surface 32*a* is 0.375 inch.

In the embodiment illustrated in FIGS. 2–13, the rib 32 (on both sides of the web 26) is integrated with the flange 24 by means of a plurality of cross webs 35 (see FIGS. 3 and 4). In this embodiment the web 26 separates the openings 35*a* (see FIGS. 4 and 8) on opposite sides. However, in some instances, the openings may extend the width of the guide, this being seen in the embodiment of FIGS. 14–16. Also, as appreciated from a consideration of FIG. 7, the rib 32 is slightly narrower than the top flange 24 to accommodate possible "toe-in" of the slide 22. It will be appreciated that the channel shaped slide 22 may become deformed during manufacture or in use whereby the bottom edges come closer together, i.e., toe-in toward each other and the relief of each side edge 32*b* of the rib 32 by about 0.030 inch avoids any potential binding engagement between the slide 22 and the guide 23. Still further, many slides 22 are equipped with indentations in the sidewalls so as to provide a right connection when the drawer is fully inserted. The reduced width of the rib 32 also is helpful in avoiding undue binding under this condition of operation.

We have found it advantageous in the resisting of vertical flexure without deformation or rupture yet while limiting the amount of material employed in the guide to provide the rib 32 of a thickness of the order of 0.090 inch reinforced by the cross ribs or webs 35 on 0.700 inch centers.

The lower flange 25 performs an advantageous function in aiding the resistance to both vertical and horizontal flexure of the guide due to drawer loading. In the illustration given in FIGS. 2–13, the bottom flange 25 is somewhat wider than the top flange 24 (1.500 inch as against 1.134 inch). Preferably, the bottom flange 24 is wider than the top flange so as to develop additional resistance to horizontal flexure with cost being the cosideration which limits the extra width of the flange 25. We also minimize the cost through the conservation of material by introducing circular openings as at 36 in the web 26 (see FIG. 4).

Referring now to FIG. 4 (or alternatively the extreme left hand end of FIG. 13) it will be seen that the top structure, viz., the flange 24 and reinforcement 31 are tapered in proceeding toward the forward end of the guide 23. The taper is provided by an inclination of both the top wall 24*a* as at 37 and the bottom wall 32*a* as at 38. Either or both tapers 37 and 38 are effective in facilitating the installation of a drawer by virtue of cutting down on the thickness of the guide portion received within the slide 22. The taper 37 provided on the flange 24 (see FIG. 4) is additionally advantageous in that it cuts down on the drag and wear as the drawer is moved in and out, it being understood that the plastic will wear in preference to the metal slide 22. Although it is possible to use cylindrical openings, preferably counter-bored (as at 27 and 28 in FIG. 3, we find that we can eliminate the use of cores in the molding procedure through the structure depicted in FIGS. 9–11 taken in combination with FIGS. 3–5. For this unique screw receiving opening 28, we provide a slot 39 in the top flange 24. The slot 39 extends inwardly from the side edge 24*b* and includes a semi-circular apex as at 39*a*. This is advantageously achieved through one-half of the mold and without the use of a pin core or the like. This results in a semicylindrical supporting wall 39*a* as can be appreciated from FIG. 11. The cooperating half of the mold is suitably configured so as to develop a further cooperating semicylindrical wall as at 40 (see FIGS. 10 and 11). This, in effect, provides a counter bore for receipt of the screw head. A boss-like structure 41 integrates the underside of the rib 32 with the upper side of the lower flange 25 (see FIGS. 11–13). A slot 42 is provided in the rib 32 (see FIGS. 3, 10 and 11) which results in the provision of a semicylindrical wall 42*a* disposed below and inwardly of the previously referred to semi-cylindrical wall 39a.

Lastly, a slot 43 extends into the lower flange 25 and the boss 41 to develop a semi-cylindrical wall 44 (compare FIGS. 5 and 11). Thus we have right and left hand vertically spaced cylindrical bearing surfaces for both the counter bore and the main bore thereby providing a screw receiving opening without the need for providing a pin core or the like.

According to the invention, the maximum deflection due to drawer loading on a guide occurs at from about 3 inches to about 4 inches of engagement between the slide 22 and the guide 23, i.e., 3 to 4 inches rearward of the forward end 33. Thus, it is possible in some instances to reduce the length of the reinforcement 31, depending upon the length of the drawer, distribution of loading, quality of material, etc. However, a favorable combination of economy and strength can be achieved by limiting the reinforcement 31 to the forward 50 percent of the guide 23 but covering at least the initial 3 inches.

This advantageous feature is also characteristic of the embodiment seen in FIGS. 14–16. There is a drawer guide 123 is seen with the same beneficial foreshortening of the reinforcement 131, but, as pointed out previously, the openings 135*a* extend from side to side (see particularly FIG. 15). However, the web 126 extends substantially the length of the guide.

Another beneficial feature distinguishing the embodiment of FIGS. 14–16 over that of FIGS. 2–13 is in the taper of the bottom flange 125 which provides strength at the position of maximum stress while minimizing the use of material. More particularly, the lower flange 125 has a maximum width (see the points designated 125a in FIGS. 14 and 16) spaced rearwardly of the front end opening 127. Hence, the flange 125 tapers in width both forwardly and rearwardly from a point intermediate the length of the reinforcement 131. Advantageously, the rearward taper is such as to develop a width approximating the outside diameter of the semi-cylindrical walls 139*a* and 142*a* (see the left hand portion of FIG. 14).

We claim:

1. A drawer guide adapted to be mounted on a furniture piece to guide the movement of a drawer positioned over the front and rear parting rails of said furniture piece and equipped with a channel shaped slide comprising

a unitary elongated plastic element having upper and lower integral horizontally extending flanges integrated by a vertically extending web which extends substantially over the element length to define a generally I-shape and transverse section and

equipped with an aperture adjacent each end for receiving a fastener to secure the element to said parting rails,

said element further including an integral reinforcement on the underside of said top flange, said reinforcement extending rearward from the front of said guide no more than about 50% of the length of the guide bat at least 3 inches to provide increased resistance to vertical flexure incident to drawer removal, said reinforcement having a planar underside over most of its length to afford good sliding contact with a drawer slide, said reinforcement including a longitudinally extending rib providing said underside and extending on each side of said web, said rib being further integrated to said upper flange and said web by a plurality of longitudinally spaced apart transversely extending webs.

2. A drawer guide adapted to be mounted on a furniture piece to guide the movement of a drawer positioned over the front and rear parting rails of said furniture piece and equipped with a channel shaped slide comprising

a unitary elongated plastic element having upper and lower integral horizontally extending flanges integrated by a vertically extending web to define a generally I-shape and transverse section and equipped with an aperture adjacent each end for receiving a fastener to secure the element to said parting rails,

said element further including an integral reinforcement extending rearward from the front of said guide no more than about 50 percent of the length of the guide but at least 3 inches, said bottom flange being wider than the top flange and the portion thereof aligned with said reinforcement, said bottom flange tapering in width both forwardly and rearwardly from a point intermediate the length of said reinforcement.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,897,981 Dated August 5, 1975

Inventor(s) Edward L. Kaplan & Gerhard Cless

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 5, Line 8, "bat" should be "but"

Signed and Sealed this

fourteenth Day of *October 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks