Jan. 5, 1965 D. L. BIESECKER 3,164,418

PLASTIC ROLLER

Filed Aug. 19, 1957

Fig. 1.

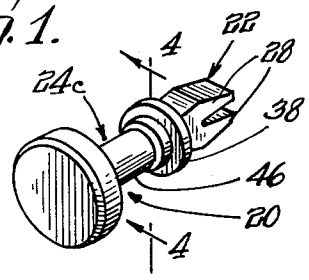


Fig. 2.

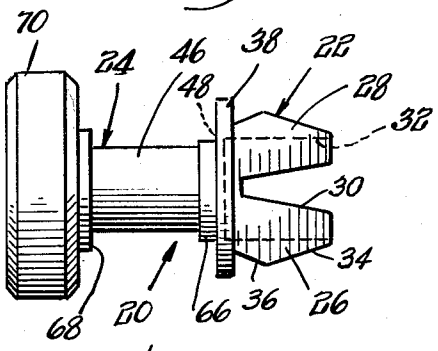


Fig. 3.

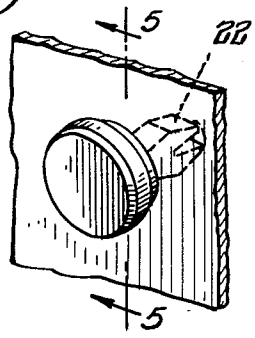


Fig. 4.

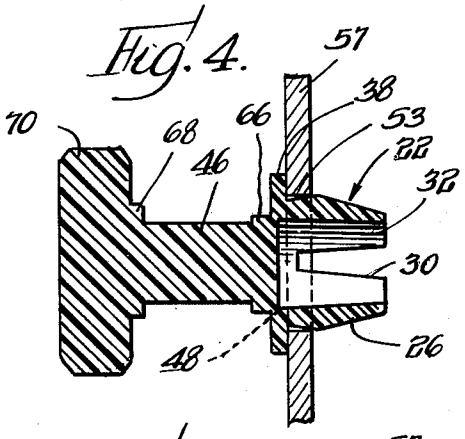


Fig. 6.

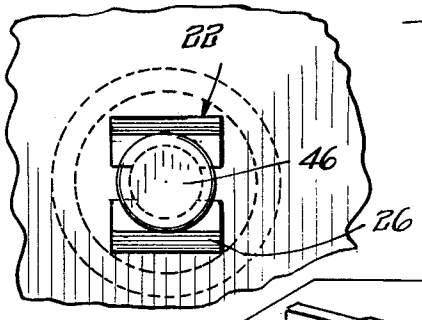


Fig. 5.

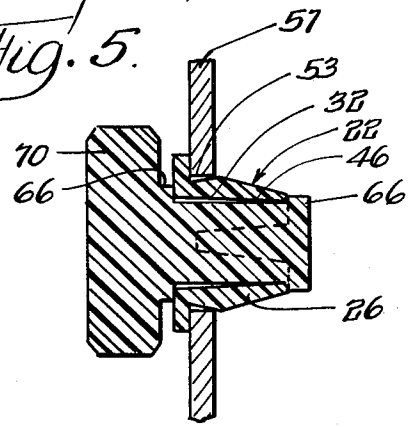
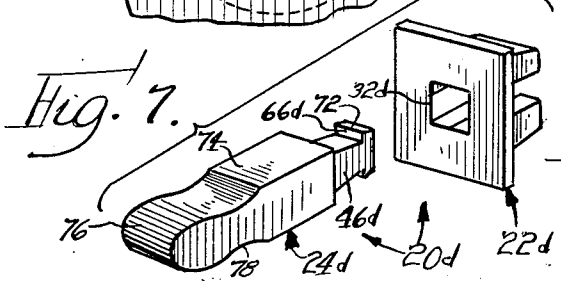


Fig. 7.



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PLASTIC ROLLER

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1 Claim. (Cl. 308—3.8)

This invention is concerned generally with the art of plastic fasteners, and more particularly with blind fasteners.

It is well known that articles often must be secured to the side of a panel or workpiece which is accessible from only one side. Fasteners of many types for use in such installations have been developed. Among the most successful of these are plastic fasteners having a collet-like shank or receptacle portion which is insertable through an aperture. A pin, which may be integral with the receptacle, subsequently is driven into the receptacle to hold the fingers of the collet-like section apart, and thereby to prevent retraction of the receptacle. As is proposed herein, the pins may have useful items or articles of manufacture formed integral therewith. Such items or articles might take the form of a shelf support.

In accordance with the prior art, it is common practice to drive the pin completely into the receptacle. Thus, there is substantially no force on the pin tending to cause driving thereof too far, or tending to retract the pin. However, when a shelf support or other useful item or article is formed integral with the pin, there is considerable opportunity for a retracting force to be applied.

Accordingly, it is an object of this invention to provide a plastic blind fastener comprising a receptacle and a pin, wherein the pin has formed integral therewith a useful item or article of manufacture, and wherein means is provided cooperable between the receptacle and pin for preventing retraction of the pin.

It is another object of this invention to provide a blind fastener as in the previous object wherein means is provided at one end of the pin for locking engagement with a complementary means at the corresponding end of the receptacle with the pin in driven position for locking the pin against retraction.

Yet another object of this invention is to provide a plastic blind fastener wherein the pin is, in driven position, rotatable relative to the receptacle, and wherein a window or shelf roller is formed integral with the pin.

Other and further objects and advantages of the present invention will be apparent from the following description when taken in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of an embodiment of the invention incorporating a window or shelf roller;

FIG. 2 is a side view of the embodiment of FIG. 1.

FIG. 3 is a perspective view showing the parts in telescoped position;

FIG. 4 is a longitudinal sectional view taken generally along the line 4—4 in FIG. 1;

FIG. 5 is a similar view showing the parts in telescoped position and taken along the line 5—5 in FIG. 3;

FIG. 6 is a rear view, showing the parts as in the collapsed position of FIG. 5; and

FIG. 7 is a perspective view of another form of the invention.

Referring now in greater particularity to the drawings, and first to FIGS. 1–6, there will be seen a plastic fastener designated generally by the numeral **20** including a grommet or anchor portion **22** and a locking member **24**. The grommet or anchor portion **22** includes a shank **26** having upper and lower jaws **28** on opposite sides of diverging slots **30**. A cylindrical aperture or bore **32** extends through the shank. The sides of the

shank are parallel to one another and planar in the illustrative embodiment shown, while the top and bottom of the shank are provided with relatively shallow camming surfaces **34** for collapsing the shank to pass through an aperture in a workpiece, and with reversely pitched retaining surfaces **36**.

The grommet or anchor portion **22** also includes a head **38**, which in FIGS. 1–5 is illustrated as being circular and transversely positioned relative to the shank.

The locking member **24** includes a drive pin **46**. The drive pin preferably is initially integral with the grommet portion **22**, and is joined thereto along a narrow sheer section at **48**, whereby the drive pin readily can be forced into the central bore **32** of the grommet portion, to prevent flexing of the jaws **28** thereof toward one another.

When the fastener is to be used, the grommet portion **22** thereof has the shank **26** inserted through an aperture **53** in a work panel or piece **57**. The jaws **28** flex toward one another, as will be understood, during such insertion, and the flange **38** is pushed tightly up against the panel **57**. Subsequently, the drive pin **46** is driven into the central bore **32**, the sheer section **48** being sheered at that time.

It will be understood that the drive pin **46** need not be made initially integral with the grommet portion of the fastener, but could be a separable part.

The drive pin **46** is provided at its inner end with a circumferential, radially extending flange **66**. This flange preferably is joined to the grommet portion **22** by means of a narrow sheer section **48**. At the opposite end of the pin **46**, there is provided a spacer **68** and a roller **70**.

The diameter of the flange **66** is initially substantially the same as that of the bore **32**. However, the bore is somewhat contracted upon insertion of the grommet through the aperture **53** and the workpiece **57**, as best may be seen in FIGS. 4 and 5. Accordingly, the flange **66** passes through the bore by virtue of the resiliency of the plastic material, and extends outwardly beyond the end of the shank **26** upon telescoping of the parts, as shown in FIG. 5. The constriction of the bore **32** is such that at the inner or right end of the shank the bore fits the pin fairly closely, but not so closely as to restrict rotation thereof. The length of the pin is such that at the time the flange **66** lies beyond the end of the shank, the spacer **68** abuts the plate or flange **38** of the grommet portion. The roller **70** thus is spaced from the workpiece **57**, and is free to rotate with the pin **46** in the grommet portion. The roller **70** thus may serve as a window or shelf roller, and is locked against retraction by the flange **66** on the end of the pin **46**.

The invention is shown as embodied in a cabinet door latch in FIG. 7. The parts are generally similar to those previously described, and are identified by similar numerals with the addition of the suffix *d*. The fastener **20***d* includes a grommet or anchor portion **22***d* similar to those previously described, but having a square axial aperture **32***d*. The external configuration of the grommet portion **22***d* also is square.

The fastener further includes a locking member **24***d* having a square solid drive pin **46***d* having a flange **66***d* at the entering end thereof. The flange extends in laterally opposite directions from the pin nad has bevelled outer surfaces as at **72** to facilitate passage through the grommet aperture **32***d*. The locking member **24***d* further includes a latch member **74** having a curved tip **76** relieved at **78**. It will be noted that the latch member **74** is not rotationally symmetrical, although it is symmetrical about a center plane. Hence, the square shape of the drive pin **46***d*, of the aperture **72***d*, and of the grommet member **22***d* is of importance in precluding rotation of the latch member **74**, whereby to hold the

latter in proper position for engagement by a cooperating strike.

As now will be seen, in each embodiment of the invention the male or locking part of the fastener is secured against retraction from the female or grommet part once the parts have been telescoped. In addition, the locking part performs a useful function such as a roller as in FIGS. 1–6, or as a cabinet door latch according to FIG. 7. In each instance the grommet portion is readily inserted in an aperture in one or more work parts due to the inherent resiliency of the plastic material from which the fastener is made. However, upon telescoping of the parts of the fastener the drive pin prevents subsequent flexing or collapsing of the shank, and the fastener cannot under ordinary circumstances be withdrawn.

It will be understood that the specific embodiments of the invention as herein shown and described are for illustrative purposes only. Various changes in structure will no doubt occur to those skilled in the art, and are to be understood as forming a part of this invention insofar as they fall within the spirit and scope of the appended claim.

The invention is claimed as follows:

A device made of resinous plastic material and adapted to be mounted in an aperture formed in a complementary panel structure and comprising a grommet portion including a head of larger diameter than the aforementioned aperture, at least a pair of radially resilient jaws extending axially from said head, and an axial bore through said head and jaws, an outer surface of each of said jaws presenting a tapered cam surface at each of their terminal ends for leading said jaws into the complementary aperture, said cam surfaces terminating in reversely pitched retaining surfaces situated between said head and said cam surfaces for retaining said grommet portion in said panel, and a locking member integrally joined initially to said grommet portion by a

rupturable shear section, said locking member including a substantially rigid solid drive pin with a head on one end and with an enlargement thereon in the vicinity of said rupturable shear section axially aligned with said bore, the dimension of said enlargement approximating the dimension of said bore, said drive pin being adapted for telescopic movement into said bore upon rupture of said shear section when said retaining surfaces are in engagement with the edges of the aperture in the complementary workpiece whereby to assure secure mounting of said grommet portion on said panel structure, said enlargement on said drive pin spaced from said head portion a distance not less than the over-all axial height of the grommet member so that the enlargement extends axially beyond the terminal ends of the jaws of said grommet portion to prevent withdrawal of said drive pin relative to the grommet member, said drive pin being of smaller diameter than said bore and being rotatable therein and said head comprising a roller integral with and disposed coaxially relative to said drive pin.

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