June 8, 1965 J. S. PARSONS 3,187,372

DOOR STOP

Filed Feb. 18, 1963

FIG. 1

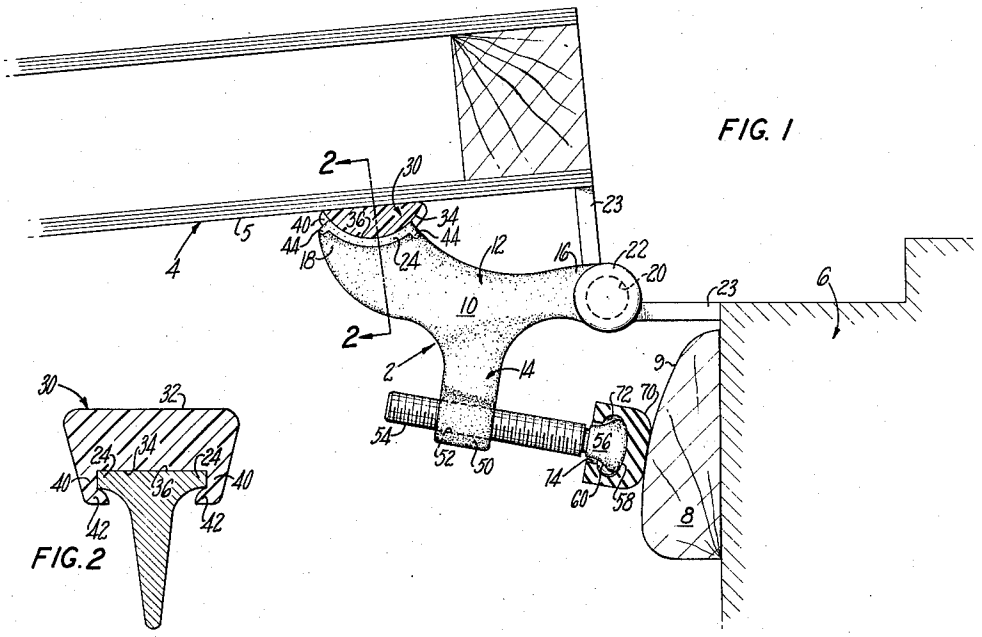


FIG. 2

FIG. 4

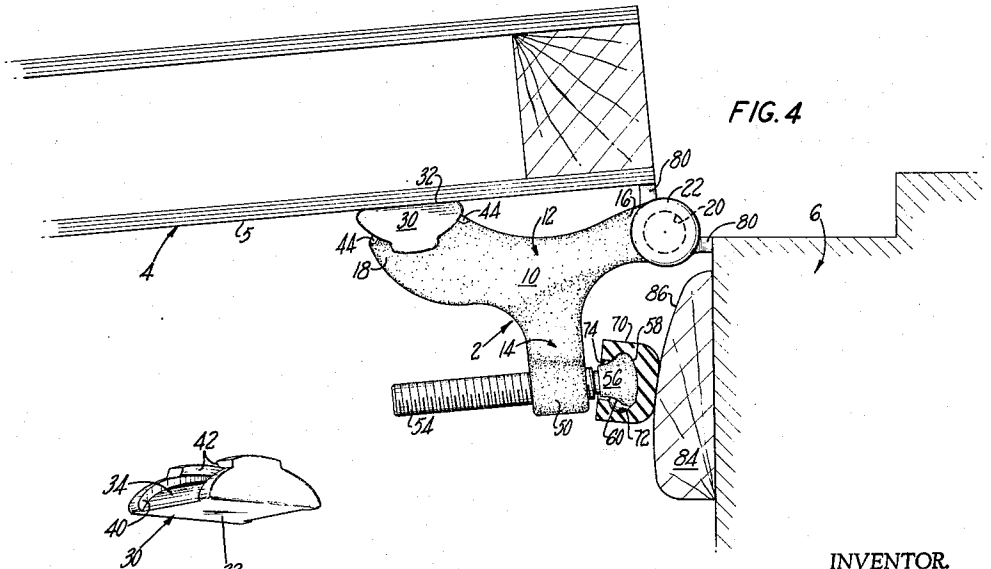


FIG. 3

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DOOR STOP

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This invention generally relates to door stops and more specifically to an improved door stop particularly suitable for use with a door hinge of the type including a pivot pin or pintle.

One of the objects of the present invention is to provide an improved door stop which will effectively check a door in various preselected open positions, regardless of the particular surface contour of the adjacent doorway frame with which it cooperates, while at the same time effectively distributing its load to such frame as well as to the door so as to minimize the possibility of damage to the latter members.

A further object of the present invention is to provide an improved door stop incorporating novel stop elements that are self-adjustable so as to permit the stop to be employed, with equal advantage, with hinges and doors of various widths and at doorway frames, having various surface contours.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application which will be indicated in the appended claims.

In the drawings:

FIG. 1 is a fragmentary plan view, with portions shown in cross section, of a door and doorway frame in which a door stop constructed in accordance with the present invention, is shown as being mounted on a hinge and in operable relationship with a door and a doorway frame;

FIG. 2 is an enlarged cross-sectional view taken generally along lines 2—2 of FIG. 1;

FIG. 3 is a perspective view of a shoe element included on the door stop; and

FIG. 4 is a view generally similar to FIG. 1 but showing the door stop utilized with a different hinge and door construction.

Referring to the drawings in detail FIG. 1 shows a door stop generally designated 2, embodying the present invention, and positioned in operable relationship with a door 4, of the hollow-core type, and a doorway frame 6 including a molding piece 8, the door 4 shown in open position as limited by the door stop 2.

The door stop 2 includes a frame 10 formed of a suitable metal, and comprising a generally elongated leg portion 12 and a lateral projection or arm 14 extending from the leg portion 12 at about the mid-point between the two ends 16 and 18 thereof. At the end 16 of the leg portion 12 there is provided a mounting aperture or eye 20 adapted to receive a hinge pin or pintle 22 of an associated hinge 23 (as shown in FIG. 1) to thereby mount the door stop 2 for pivotal movement. At the other end 18 of the leg portion 12 there is provided a pair of arcuately extending guide flanges 24 projecting generally normal to the end 18 of the leg portion 12 from the opposite sides thereof as best shown in FIG. 2.

In accordance with one aspect of the present invention, an adjustable shoe generally designated 30 for contacting the door 4, is slidably mounted for rocking movement on the guide flanges 24 of the frame leg portion 12. In the shown embodiment, the shoe 30 is formed from a suitable resilient hard wearing, self-lubricating material, such as polyethylene plastic, and includes on

one side, a flat generally rectangular face 32 adapted to engage the panel 5 of the door 4 (as shown in FIG. 1) and being formed of a sufficient size so that the reaction force imparted to the door 4 by the stop will be distributed over a relatively large area of the door panel to thereby avoid stress concentration thereon. This feature is particularly important when the door stop is used in connection with a door of the hollow-core type illustrated, wherein the core-enclosing panels 5 are formed from relatively thin stock.

The shoe 30, as shown, further includes an arcuate or curved face 34, on the side opposite that of flat face 32, as best shown in FIG. 3. The curved face 34 of the shoe is adapted to slidably engage the end surface 36 of the leg portion 12 which is curved to conform to the shoe face 34 and which forms the upper side (as viewed in the drawings) of the guide flange 24 of the stop frame 10.

In order to slidably mount the shoe 30 for rocking movement, on the guide flanges 24 of the frame 10, the shoe 30 is provided with a pair of arcuate ribs or flanges 40 projecting normally from the curved face 34 thereof and being spaced so as to engage the guide flanges 24 of the frame 10 as shown in FIG. 2. The arcuate ribs 40 of the shoe 30 are provided with inwardly extending tabs 42 spaced from the curved face 34 and dimensioned to engage the lower surface (as viewed in FIG. 2) of the guide flanges 24 so as to retain the shoe 30 on the guide flanges 24 but to permit slidable movement of the shoe 30 thereon.

From the above it will be seen that upon engagement with the door 4, the shoe 30 is free to rock along the guide flanges 24 of the frame to thereby adjust to engage the surface 5 of the door 4 in a flat and even manner. In order to limit the sliding movement of the shoe 30 on the guide flanges 24 so as to prevent accidental dislodgment of the shoe 30 from the stop frame 10, a pair of stop projections 44 are provided on each of the ends of the guide flanges 24 so as to be engageable with the tabs 42 of the shoe 30 to thereby limit the sliding movement of the shoe 30. Installation of the shoe 30 on the guide flanges is simply accomplished by inserting the stop projections 44 of the guide flanges 24 under the tabs 42 of the shoe 30.

The arm 14 of the stop frame is provided at the outer end thereof with a transversely extending boss 50 having a threaded passage 52 extending therethrough and adapted to receive a correspondingly threaded stud or bolt 54 which extends generally parallel to the leg portion 12 of the stop frame 10. One end of the bolt 54 is formed with an enlarged head or knob portion 56 which in the illustrated embodiment includes a convex end wall 58 and an annular sidewall 60 of generally concave cross section.

In accordance with another aspect of the present invention an adjustable bumper 70 having a cup-like body formed from a suitable flexible and resilient material such as rubber, is provided on the knob 56 of the bolt 54 so as to engage the molding 8 as shown in FIG. 1. The bumper 70 is formed with a cavity 72 which receives the knob 56 of the bolt 54 to removably retain the bumper 70 on the bolt 54, but to permit the bumper to undergo universal movement relative thereto so as to adjust to the contour of the surface 9 of the molding 8. The cavity 72 of the bumper 70 is enlarged so as to have a greater dimension than the knob 56 and is provided with an enlarged entry port or throat 74 thereby permitting the bumper to self-adjust in all directions to conform to the molding surface 9 with the bumper disposed generally perpendicular thereto, regardless of the particular angular disposition of the bolt 54 relative to the surface 9 of the molding 8.

In use, the door stop 2 is pivotally mounted on the

hinge pin 22 so that opening movement of the door 4 will be limited by engagement between the slidable shoe 30 and the door 4 and between the adjustable bumper 70 and the molding 8 as shown in FIG. 1. The particular position at which the door will be checked by the stop 2 may be selectively varied, as desired, by changing the longitudinal position of the bolt 54 through means of the threads thereon.

The adaptability of the stop 2 as provided by the adjustability of the shoe 30 and bumper 70 is clearly illustrated in FIG. 4 wherein the stop 2 is utilized on a hinge whose leaves 80 are of a lesser width than those of the hinge 23 described above and wherein the molding 84 has a somewhat different surface contour 86 than the molding 8 described above. In FIG. 4, the bolt 54 of the stop 2 is shown as having been longitudinally adjusted so that the stop will check the door in substantially the same position as shown in FIG. 1, while the shoe 30 and the bumper 70 are shown as having self-adjusted to meet the changed conditions of hinge width and molding contour.

It will thus be seen that when the stop 2 is in operative position such as shown in FIGS. 1 and 4, the door will not only be positively checked but also the shoe 30 and bumper 70 will automatically adjust to distribute the reaction force to the door 4 and the adjacent molding over an area sufficiently large so as to avoid excessive wear or damage on these members.

From the foregoing it will be seen that the present invention provides an improved stop that is extremely adaptable in use while at the same time being economical to manufacture.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

I claim:

1. A door stop comprising a frame including a leg portion having a hinge pin receiving aperture at one end and a pair of arcuate guide flanges at the other end extending generally normal to the end of said leg portion, an adjustable resilient shoe having a flat face adapted to engage a door mounted to rotate on said hinge pin, means cooperable with the arcuate guide flanges of said frame for mounting the shoe for relative sliding movement therewith, a laterally extending arm projecting from said leg portion generally at a mid-point between the ends thereof, a bolt adjustably connected to the end of said arm and having a knob at one end thereof, and a resilient bumper for engaging a doorway frame mounted

on said knob and having a cavity laterally dimensioned sufficiently greater than said knob to provide universal and lateral movement of the bumper relative to said knob.

2. The door stop defined in claim 1 wherein said means mounting the shoe on the arcuate guide flanges of said frame includes a pair of resilient spaced arcuate inwardly extending flanges on the shoe engaging said guide flanges, said arcuate guide flanges have a pair of stop projections at each end thereof engageable with the inwardly directed flanges of the shoe for limiting movement thereof.

3. A hinge pin mounted door stop comprising in combination a frame having a leg portion provided with a hinge pin receiving aperture at one end thereof, a resilient adjustable shoe mounted on the other end thereof for engaging a door mounted to swing on the hinge pin, and an arm extending laterally from the midpoint between the ends of the leg portion, a bolt having a head providing a convex end surface adjustably connected to said arm at the free end thereof, and a resilient bumper having a cavity for receiving the bolt head, said cavity having a throat portion of lesser lateral dimension than said head for removably retaining the bumper mounted on the head, and an enlarged inner portion of greater lateral dimension than said head to accommodate the lateral and universal movement of the bumper relative to the bolthead.

4. A hinge pin mounted door stop comprising a leg portion having a hinge pin receiving aperture at one end thereof and a shoe on the other end thereof for engaging a door mounted by the hinge pin, an arm projecting laterally from the leg portion generally at the midpoint between the ends thereof and a bolt adjustably connected to the end of said arm and having an enlarged knob on one end thereof, a resilient cup-shaped bumper having a narrow throat portion expandable to insert the knob therein and having an inner cavity of greater lateral diameter than said knob to provide universal and lateral movement of the bumper relative to the knob whereby the bumper is self-adjusting in all directions to accommodate the variations in the doorway frame.

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