DOOR HINGE PIN MOUNTED ADJUSTABLE DOOR STOP

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A pair of abutment arms are provided including first and second pairs of corresponding ends. The first pair of corresponding ends are provided with resilient members and the second pair of corresponding ends include transverse splined sleeve and shank portions which are removably axially slidably engageable with each other in predetermined adjusted relative angular positions of the arms. The door stop further includes a hinge pin extending axially of and supported from one of the second pair of corresponding ends of the arms for telescopic reception within the series of axially aligned interdigitated hinge barrels provided on conventional hinges. With the abutment-equipped arms thus mounted relative to the hinge barrels of a hinge, one of the abutment-equipped first pair of ends of the arms may be positioned to engage an adjacent wall surface while the other abutment-equipped arm end of the first pair of corresponding arm ends may be positioned to engage the associated door to limit opening of the latter relative to the aforementioned wall surface.

7 Claims, 11 Drawing Figures
DOOR HINGE PIN MOUNTED ADJUSTABLE DOOR STOP

BACKGROUND OF THE INVENTION

Various forms of hinge pin mounted door stops have been heretofore designed and have been equipped with various means to adjust the extent to which an associated door may be opened. However, these various adjustment structures have required the utilization of various forms of tools and are therefore difficult for a person unskilled with tools to adjust. Examples of previously patented adjustable door stops including some of the basic components of the instant invention are disclosed in U.S. Pat. Nos. 2,055,743, 2,660,750, 3,135,012, 3,157,906 and 3,174,179.

BRIEF DESCRIPTION OF THE INVENTION

The door stop construction of the instant invention utilizes a pair of arm members including first and second pairs of corresponding ends. The first pair of corresponding ends of the arms are equipped with adjustable resilient abutments for engagement with an associated door and an associated wall structure and the second pair of corresponding ends of the arms include axially engageable and disengageable splined sleeve and shank portions which extend transversely of the arms and are readily engageable with each other with the arms in predetermined adjusted positions relative to each other. Furthermore, the door stop includes a hinge pin portion which is supported from at least one of the second pair of corresponding ends of the arms and may be utilized as the hinge pin of a hinge construction having a series of axially aligned interdigitated hinge barrels.

The main object of this invention is to provide an adjustable door stop construction whose structural features enable ready adjustment of the door stop merely by removal of the associated hinge pin.

Another object of this invention, in accordance with the immediately preceding object, is to provide a door stop construction which may be utilized on substantially any door hingedly supported by means of a hinge assembly which will accept an axially removable hinge pin.

Still another object of this invention is to provide a door stop which is fully adjustable to provide an infinite number of stop positions of the corresponding door.

A final object of this invention to be specifically enumerated herein is to provide a door stop construction in accordance with the preceding objects and which will conform to conventional forms of manufacture, be of simple construction and easy to install so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view of the lower portion of a conventional door construction and the wall structure from which the door is hinged with a door stop constructed in accordance with the present invention operatively associated with the lower door hinge and the adjacent wall and door portions;

FIG. 2 is a horizontal sectional view taken substantially upon a plane spaced above the door stop construction illustrated in FIG. 1 and with the door in its full open position as determined by the door stop;

FIG. 3 is a horizontal sectional view similar to FIG. 2 but with the door stop construction having various components thereof in different positions of adjustment;

FIG. 4 is a fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 4—4 of FIG. 2;

FIG. 5 is a horizontal sectional view taken substantially upon the plane indicated by the section line 5—5 of FIG. 4;

FIG. 6 is an exploded perspective view of the door stop construction illustrated in FIGS. 1 through 5;

FIG. 7 is a horizontal sectional view similar to FIG. 2 but illustrating a modified form of door stop construction;

FIG. 8 is a fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 8—8 of FIG. 7;

FIG. 9 is a fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 9—9 of FIG. 8;

FIG. 10 is an exploded perspective view of the door stop construction illustrated in FIGS. 7, 8 and 9; and

FIG. 11 is an enlarged fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 11—11 of FIG. 10.

Referring now more specifically to the drawings, the numeral 10 generally designates a wall construction having a door opening 12 formed therein, one vertical edge of the wall construction defining one edge of the door opening 12 being equipped with a trim or molding strip 14.

A horizontally swingable door 16 is supported from the wall construction 10 by means of a plurality of vertically spaced conventional hinge assemblies 18 equipped with axially aligned interdigitated hinge barrels 20 and 22. In order to secure the hinge barrels 20 and 22 in their relative positions and for relative angular displacement a vertical hinge pin 24 is usually removably telescoped downwardly through the hinge barrels 20 and 22.

The door stop of the instant invention is referred to in general by the reference numeral 24 and includes a pair of rod-like arms 26 and 28 including a first pair of corresponding widened ends 30 and 32. The ends 30 and 32 have transverse threaded bores 34 and 36 formed therethrough and threaded shank members 38 and 40 equipped with resilient abutment heads 42 and 44 are adjustably threaded engaged in the bores 34 and 36.

The arms 26 and 28 include a second pair of corresponding ends 46 and 48, the end 46 including a transversely enlarged cylindrical head portion 50 equipped with a diametrically reduced coaxial splined shank 52 at one end. The end 46 is provided with an axial blind bore 54 which opens outwardly through the free end of the shank 52 and has its inner end extending into the head 50, a hinge pin 56 having one end thereof suitably anchored in the blind bore 54.

The end 48 defines a transverse sleeve having a splined through bore 58 formed therethrough and in
which the shank 52 is slidingly receivable in a plurality of relatively angularly adjusted positions of the arms 26 and 28 with the shank 52 keyed to the end 48 by means of the splines on the shank 52 and the splines in the bore 58.

When it is desired to mount the door stop 24, the conventional hinge pin is removed from the hinge barrels 20 and 22 and the hinge pin 56 has its lower free end downwardly inserted through the splined bore 58 and the sleeve 52 is slidingly engaged in the bore 58 after the correct relative positions of the arms 26 and 28 have been determined. Then, that portion of the hinge pin 56 which projects downwardly from the end 48 is telescoped downwardly into the hinge barrels 20 and 22. Of course, it is to be noted that ready adjustment of the door stop 24 may be accomplished by exerting an upward pull on the arm 26 so as to withdraw the shank 52 from the bore 58, angularly displacing the arm 26 relative to the arm 28 as desired thereafter downwardly displacing the arm 26 so as to again engage the splined shank 52 in the splined bore 58.

Furthermore, slight adjustments may be accomplished by variably adjusting the shank members 38 and 40; note the different adjusted positions thereof illustrated in FIGS. 2 and 3.

Referring now more specifically to FIGS. 7 through 11 of the drawings, there may be seen a modified form of door stop referred to in general by the reference numeral 124. Inasmuch as various of the components of the door stop 124 find substantial counterparts in the door stop 24, corresponding reference numerals in the 100 series are utilized to designate the components of the door stop 124 finding their substantial equivalents in the door stop 24. One of the differences of the door stop 124 as opposed to the door stop 24 is that the end portions 130 and 132 are slightly angularly displaced, see FIG. 11, relative to the longitudinal centerline of the corresponding ends 146 and 148. Further, with the door stop 124, the conventional headed hinge pin 156 is retained. In addition, the end 146 of the arm 126 is substantially identical to the end 46, except that the end 146 does not include a blind bore corresponding to the blind bore 54 or a hinge pin portion corresponding to the hinge pin portion 56. Furthermore, while the end 148 defines a transverse sleeve, the sleeve 148 defines a smooth bore 149 equipped with a counterbore 158 corresponding to the splined bore 58.

When installing the door stop 124, the conventional hinge pin 156 is removed from the hinge barrels 20 and 22 and the end 148 is thereafter placed over the uppermost hinge barrel 20 with the bore 149 registered with the bore formed through the upper hinge barrel 20. Then, the conventional hinge pin 156, which is equipped with a diametrically enlarged head 157, is inserted downwardly through the bore 149 and into the hinge barrels 20 and 22. The axial extent of the head 157 is negligible and the shank 152 corresponding to the splined shank 52 is thereafter downwardly inserted into the splined counterbore 158 after the desired relative angulation of the arms 126 and 128 is achieved. Thus, when it is necessary to readjust the door stop 124, it is merely necessary to exert an upward force on the arm 126 to axially withdraw the shank 152 from the counterbore 158 and to thereafter adjust the arm 126 to the desired position before again downwardly displacing the splined shank 152 into the splined counterbore 158 in the new position of adjustment.

By slightly angulating the ends 130 and 132, the ends 146 and 148 tend to be slightly cocked relative to each other when the associated door is swung to a position with the abutment 144 engaged with the door and the abutment 142 engaged with the trim strip or molding 14.

Of course, inasmuch as each form of door stop includes threadedly adjustable resilient abutment members and the range of adjustment of the abutment members is greater than the effective change in relative adjustment thereof which may be effected by displacing the corresponding splined sleeve and shank portions to the next position of relative adjustment thereof, both disclosed forms of door stop are capable of an infinite range of adjustment.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. In combination with a hinge construction having a series of axially aligned interdigitated hinge leaf supported hinge barrels provided with aligned bores for receiving an axially insertable and removable hinge pin therethrough, a pair of support arms including first and second pairs of corresponding ends, one pair of corresponding ends of said arms including axially disengageable externally and internally splined transversely extending shank and sleeve portions telescopically engaged with each other, the other pair of ends of said arms including oppositely laterally facing abutment surface means and a hinge pin member carried by one of said first pair of end portions at least substantially coaxial therewith projecting outwardly of one end of said portions axially removably telescoped into said series of hinge barrels from one end thereof, said shank and sleeve portions being removably telescopically engageable with each other with said arms disposed in a plurality of predetermined relatively angularly displaced positions.

2. The combination of claim 1 wherein at least one of said abutment surface means is supported from said other end of the corresponding arm for adjustable positioning laterally of the latter.

3. The combination of claim 2 wherein said abutment surface means comprise outer resilient abutment heads carried by the outer ends of a pair of threaded shank members threadedly engaged with said arm members.

4. The combination of claim 1 wherein said hinge pin member is carried by said shank portion, said shank portion projecting endwise laterally outwardly of one side of the corresponding arm, said hinge pin member being of a smaller diameter than said shank portion and projecting endwise outwardly of the outer end of said shank portion.

5. The combination of claim 1 wherein said sleeve portion includes an axial bore formed therethrough including a counterbore at one end, said counterbore being splined and said shank portion being telescoped into and meshed with the splines in said counterbore, said pin member including an enlarged head on one end seated in said counterbore between the inner end thereof and said shank portion with the remainder of
said pin projecting through said bore outwardly of the end thereof remote from said counterbore.

6. The combination of claim 1 wherein said abutment surface means are supported from said other pair of ends of said arms for adjustable positioning laterally of the latter, said abutment surface means comprising outer resilient abutment heads carried by the outer ends of a pair of threaded shank members threadedly engaged with said arm members, said threaded shank members being slightly angularly displaced about axes generally paralleling the longitudinal centerlines of said arms relative to the center axes of said shank and sleeve portions.

7. The combination of claim 6 wherein said sleeve portion includes an axial bore formed therethrough including a counterbore at one end, said counterbore being splined and said shank portion being telescoped into and meshed with the splines in said counterbore, said pin member including an enlarged head on one end in said counterbore between the inner end thereof and said shank portion with the remainder of said pin projecting through said bore and outwardly of the end thereof remote from said counterbore. * * * * *