United States Patent

Hansen et al.

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[45] **July 11, 1972**

[54] DOOR HOLDER

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 6,808, Jan. 29, 1970, abandoned.

[52] **U.S. Cl.**.....**292/70,** 292/DIG. 19, 292/DIG. 38

[51] **Int. Cl.**.....**E05c 19/02**

[58] **Field of Search**.....292/14, 16, 17, 70, 74, 76, 292/DIG. 15, DIG. 19, DIG. 38; 16/86 A

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[57] **ABSTRACT**

A door holder including a receptacle unit adapted to be mounted on a wall and having a plastic body member with an outwardly opening central axial cavity, and a plunger unit adapted to be mounted on a door and having an elongated shank with an outer end releasably interengageable in the cavity of the body member.

6 Claims, 6 Drawing Figures

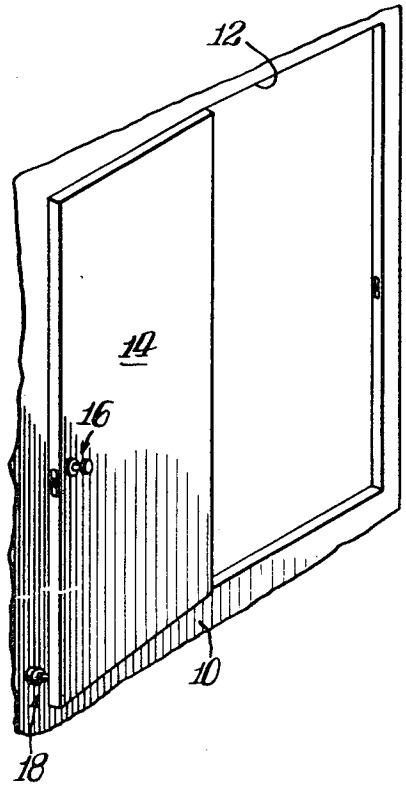

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Fig. 1.

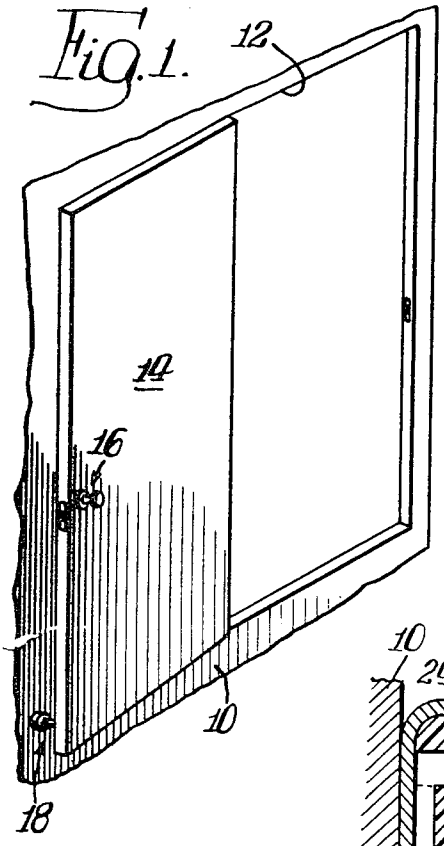


Fig. 2.

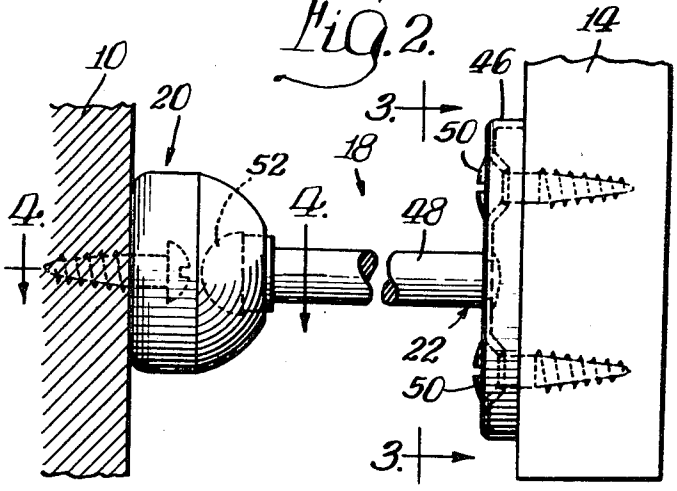


Fig. 6.

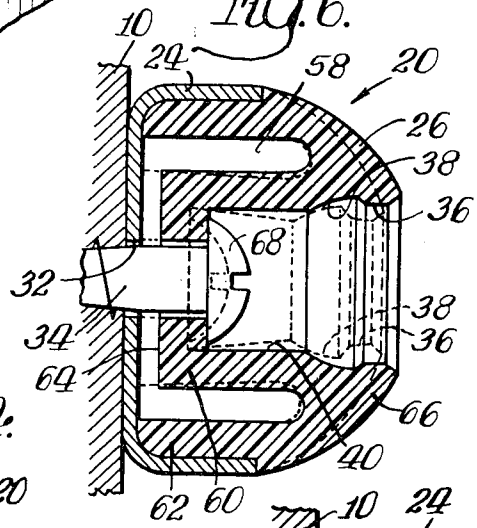


Fig. 3.

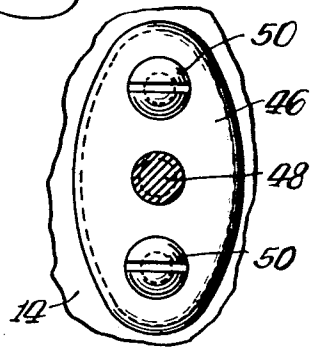


Fig. 4.

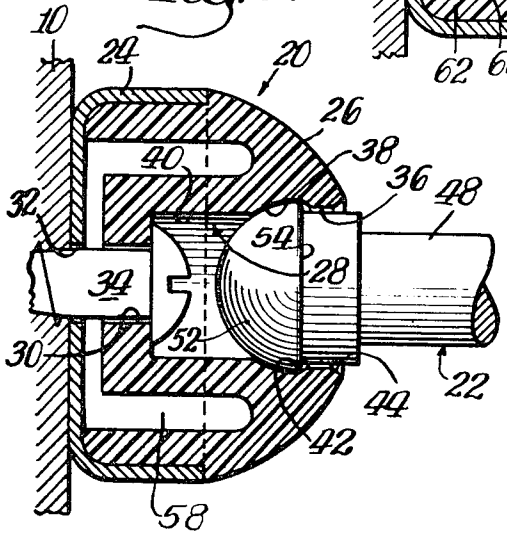
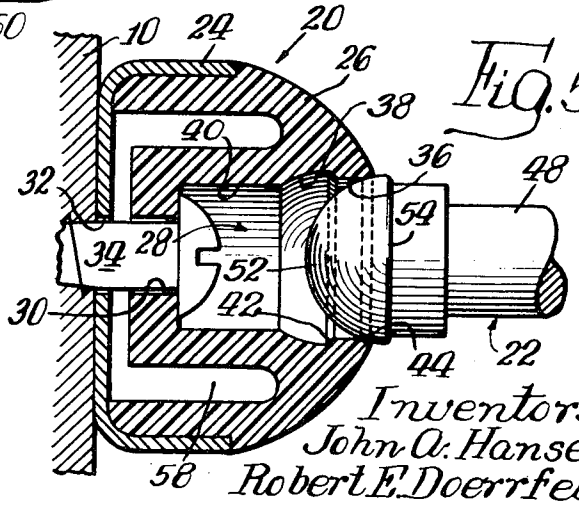


Fig. 5.



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DOOR HOLDER

This application is a continuation-in-part application of U. S. Serial No. 6808, and now abandoned which was filed Jan. 29, 1970.

FIELD OF THE INVENTION

The present invention relates generally to a door holder for releasably and selectively maintaining an open swingable door in spaced relation along a wall.

SUMMARY OF THE INVENTION

The door holder of the present invention comprises a receptacle unit and a plunger unit. The receptacle unit includes a metal cup member in which is seated a plastic body member having a cavity formed with an outer annular throat zone, an inner cylindrical zone, and an intermediate spherical zone. The plunger unit includes a mounting flange and an elongated shank having an outer semi-spherical end.

The receptacle unit is adapted to be mounted on a wall by means of a single fastener having a head disposed in the cylindrical zone. The plunger unit is adapted to be mounted on a door by means of fasteners disposed through the mounting flange. The outer end of the shank is movable through the deformable throat zone to effect interengagement of the plunger and receptacle units whereby to selectively maintain the door in open position in spaced relation to the wall. During interengagement, the outer shank end is conformably received in the spherical zone; with this arrangement, the outer shank end is maintained out of contact with the head of the fastener of the receptacle unit and the door is properly spaced from the wall to accommodate the door handle.

When the door is to be closed, the outer shank end is removable from the receptacle through the deformable throat zone. The door holder of the present invention is thus adapted to selectively and releasably hold a door in spaced relation along a wall, and has particular utility in association with the door and wall of a mobile home or the like.

One of the important features of this invention is that the receptacle unit is constructed to selectively adjust the holding force on the outer end of the shank. The holding force is selected by means of varying the degree of pressure exerted by the head of the fastener on the plastic body member.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a portion of a wall and of a door maintained open in spaced relation along the wall by means of the door holder of the present invention;

FIG. 2 is an enlarged side elevational view of the door holder of FIG. 1, showing the plunger unit inter-engaged with the receptacle unit;

FIG. 3 is a sectional view, taken substantially along the line 3—3 in FIG. 2, looking in the direction indicated by the arrows;

FIG. 4 is a median axial sectional view of the receptacle unit of the door holder of FIG. 2, and an elevational view of the outer end portion of the plunger unit interengaged with the receptacle unit; and

FIG. 5 is a view corresponding generally to FIG. 4, but shows the outer end portion of the plunger unit out of interengagement with the receptacle unit; and

FIG. 6 is a median axial sectional view of the receptacle unit of FIG. 1, showing the fastener in its mounting position, with the dotted lines illustrating the displacement of the body member when the fastener is tightened to increase the holding force of the receptacle unit.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, there is identified by the reference numeral 10 a fragmentary portion of a wall of a mobile home or the like. The wall 10 is provided with an opening 12 at one side of which is hingedly mounted a door 14 having a conventional door knob assembly 16 on each side of the door. The door 14 is swingable between a closed position within the opening 12 and an open position along the wall 10. The door 14 is adapted to be selectively maintained in open position in spaced relation to the wall 10 by means of a door holder indicated generally by the reference numeral 18.

As shown in FIG. 2, the door holder 18 of the present invention comprises a receptacle unit 20 on the wall 10, and a plunger unit 22 on the door 14.

The receptacle unit 20 (FIGS. 4 and 5) includes a circular metal cup member 24, and a body member 26 press fitted or otherwise seated in the cup member 24. The body member 26, which is fabricated of a temporarily elastically deformable plastic, such as nylon or Plaskon 8252 marketed by Allied Chemical Corporation, is provided with an outwardly opening central axial cavity 28 and a coaxial mounting hole 20 which is aligned with an aperture 32 in the cup member 24. A fastener in the form of a wood screw 34, extends through the mounting hole 30 and aperture 32 and is engaged or threaded in the wall 10 for securing the receptacle unit 20 to the wall. The cavity 28 of the body member 26 is formed with an annular throat zone 36 adjacent the outer end thereof, a spherical zone 38 immediately inwardly of the throat zone 36, and a cylindrical zone 40 which serves to accommodate the head of the fastener 34. Additionally, the throat zone 36 is suitably beveled at its inner and outer ends as at 42 and 44.

The plunger unit 22 (FIGS. 2, 3 and 5) includes a base mounting flange 46 and an elongated shank 48. The base flange 46 is mounted on the door 14 by means of fasteners such as wood screws 50, while the inner end of the shank 48 projects through an aperture in the base flange 46 and is peened or flared over for securing the shank in the base flange. The outer end 52 of the shank 48 is semi-spherical with a diameter slightly greater than the diameter of the adjacent section of the shank 48 whereby an annular shoulder 54 is defined. The diameter of the outer shank end 52 is also slightly greater than the diameter of the throat zone 36.

As the door 14 is swung open and approaches a full open position, the outer end 52 of the shank 48 first contacts the beveled outer end 44 of the throat zone 36 (FIG. 6), and is then urged through the throat zone into the spherical zone 38 (FIG. 5). With the plunger unit 22 thus interengaged with the receptacle unit 20 and the shank shoulder 54 releasably engaged behind the throat zone 36, the door 14 is selectively maintained in open position in spaced relation to the wall 10 to accommodate the door knob assembly 16 on the side of the door adjacent the wall. The length of the shank 48 is proportional to the extent of projection of the door knob assembly. When the door 14 is pulled away from the wall 10, the shank shoulder 54 initially contacts and slides along the beveled inner end 42 of the throat zone 36, and the outer shank end 52 is then moved through the throat zone from the position shown in FIG. 5 to the position shown in FIG. 6 whereby to release the door for closing.

As will be appreciated, the throat zone 36 is deformed or enlarged radially outwardly as the outer shank end 52 passes through the zone in either direction, and thereafter immediately returns to its normal position shown in FIGS. 5 and 6. Also, when the outer shank end 52 is interengaged in the cavity 28, it is conformably received in the spherical zone 38 and is thereby maintained out of contact with the head of the fastener 34. Furthermore, the receptacle unit 20 is mounted on the wall 10 with a single fastener 34, and the arrangement between the receptacle and plunger units 20 and 22 is such as to facilitate accurate alignment therebetween during installation of the door holder. In this connection, the plunger unit 22 is first mounted on the door 14. Next, chalk or other marking media is applied to the outer shank end 52, and the door 14 is swung open so that the chalk places a mark on the wall 10. Then, the fastener 34 is inserted through the receptacle unit 20 and secured in the wall 10 at the chalk mark whereby the cavity 20 is located in line with the shank 48 when the latter is at the position of interengagement.

One of the important features of this invention is the ability to selectively vary the holding force on the plunger unit **22** by the receptacle unit **20**. This feature is provided by virtue of the design of the inner end of body member **26**. As illustrated in FIG. **6**, the inner end of body member **26** is formed with an annular recess **58** to define an inner ring **60** and an outer concentric ring **62**. The outer ring **62** is press fitted or otherwise seated in the cup member **24**. The inner face **64** of the inner ring **60** is spaced away from the cup member.

Due to the flexible nature of the body member **26**, any inward displacement of inner face **64** causes a proportional radially inward draw on the outer end **66** of body member **26**. This inward displacement is effected by the pushing force exerted by the head **68** of fastener **34** as the same is being screwed inwardly. The radial inward or outward movement of the outer end **66** results in changing the diameter of the throat and spherical zones **36**, **38** to vary the tolerances with a proportional variation in the holding force of receptacle unit **20** on plunger unit **22**.

From the foregoing description of the inner end of body member **26**, it will be appreciated that the holding force of the receptacle unit **20** can be varied through an infinite range by displacing the inner ring **60** of body member **26** by means of turning the head of fastener **34**.

Referring to FIG. **6**, there is depicted in dotted lines the resulting inward draw or displacement of the outer end **66** of body member **26** when the fastener is completely tightened. It will be understood that due to the firmness of the body member **26**, the receptacle unit **20** will be held rigidly in place when the fastener **34** is in the solid line position of FIG. **6** as well as the dotted line position.

One major advantage of this adjustable feature is that it will greatly increase the useful life of the door holder **18**, for as the body member **26** loses some of its elasticity after a long period of use, the fastener **34** can be tightened until the desired holding force is obtained.

While there has been shown and described a preferred embodiment of the present invention, it will be understood by those skilled in the art that various rearrangements and modifications may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. A door holder for releasably and selectively maintaining an open swingable door in spaced relation along a wall comprising a receptacle unit including a metal cup member and an elastic body member having formed in its inner end an annular recess to define an outer ring portion and a concentric inner ring portion, where the inner face of said inner ring portion is disposed inwardly of the inner face of said outer ring portion, said outer ring portion is seated in said cup member, an outwardly opening central axial cavity formed in said body member and extending through a substantial part of the length of said inner ring portion, an axial opening formed from the inner end of said cavity to said inner face of said inner ring portion and in registry with an aperture formed in said cup member, and a fastener having a head engaging the inner end of said cavity and extending through said axial opening and said aperture for mounting said receptacle unit on one of said wall or door, and a plunger unit adapted to be mounted on the other of said wall or door and including an elongated shank having an outer end releasably interengageable in said cavity of said body member.

2. The door holder of claim **1** wherein said cavity of said body member is formed with an annular throat zone adjacent the outer end thereof, and wherein said outer end of said shank is semi-spherical with a diameter slightly greater than the diameter of said throat.

3. The door holder of claim **1** wherein said cavity of said body member is formed with a spherical zone immediately inwardly of said throat zone for conformably receiving said outer end of said shank, and wherein the section of said shank adjacent said outer end thereof has a smaller diameter than that of said outer end of said shank whereby an annular shoulder is defined for releasable engagement behind said throat zone.

4. A door holder for releasably and selectively maintaining an open swingable door in spaced relation along a wall comprising a receptacle unit including a metal cup member and an elastic body member having formed in its inner end an annular recess to define an outer ring portion and a concentric inner ring portion, where the inner face of said inner ring portion is disposed inwardly of the inner face of said outer ring portion, said outer ring portion is seated in said cup member, an outwardly opening central axial cavity formed in said body member and extending through a substantial part of the length of said inner ring portion, an axial opening formed from the inner end of said cavity to said inner face of said inner ring portion and in registry with an aperture formed in said cup member, and a fastener having a head engaging the inner end of said cavity and extending through said axial opening and said aperture for mounting said receptacle unit on one of said wall or door, where the diameter of the outer end of said cavity decreases as said fastener is tightened to proportionally increase the holding force of said receptacle unit, and a plunger unit adapted to be mounted on the other of said wall or door and including an elongated shank having an outer end releasably interengageable in said cavity of said body member.

5. The door holder of claim **4** wherein said cavity of said body member is formed with an annular throat zone adjacent the outer end thereof, and wherein said outer end of said shank is semi-spherical with a diameter slightly greater than the diameter of said throat.

6. The door holder of claim **5** wherein said cavity of said body member is formed with a spherical zone immediately inwardly of said throat zone for conformably receiving said outer end of said shank, and wherein the section of said shank adjacent said outer end thereof has a smaller diameter than that of said outer end of said shank whereby an annular shoulder is defined for releasable engagement behind said throat zone.

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