

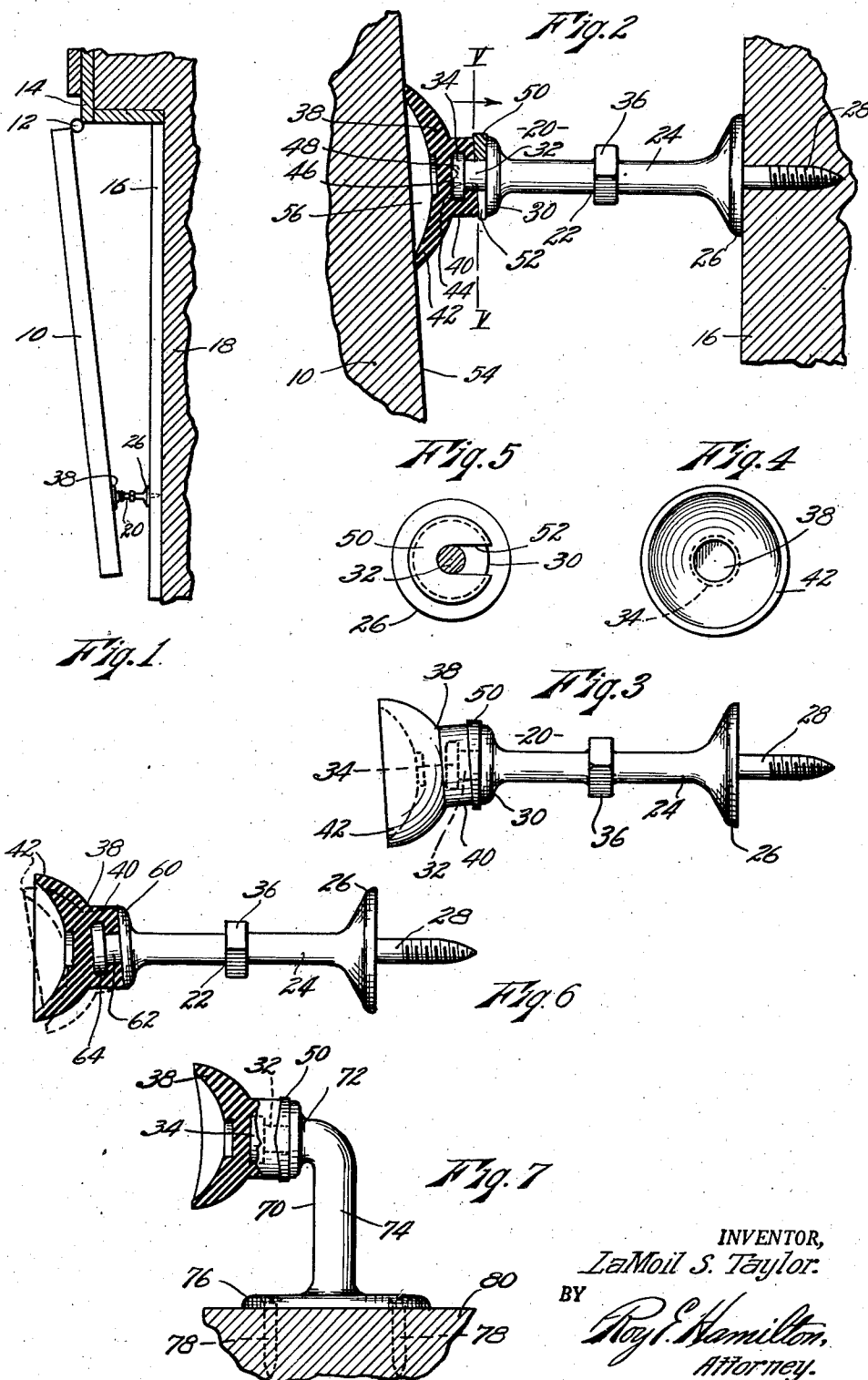
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DOORSTOP AND RETAINER

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DOORSTOP AND RETAINER

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This invention relates to improvements in door stops and retainers and more particularly to a device having a suction cup for stopping and engaging the door in the open position.

The principal object of the present invention is the provision of a door stop and retainer provided with a door engaging vacuum cup removably and adjustably carried by a fixed base member.

Another object of the invention is the provision of a door stop and retainer including a fixed base and a rubber vacuum cup member adjustably mounted on said base whereby the planar face of said vacuum cup may be disposed at various angles to the major axis of said base member.

Other objects are simplicity and economy of construction, efficiency of operation and adaptability for attachment to the wall structure to the floor or to the door itself.

With these objects in view as well as other objects which will appear during the course of the specification, reference will now be had to the drawing, wherein:

Fig. 1 is a plan view of a hinged door showing a portion of the building structure and including a door stop and retainer embodying this invention.

Fig. 2 is an enlarged view of the door stop and retainer with portions of the associated building structure shown in Fig. 1 and with parts in section.

Fig. 3 is a plan view of the door stop and retainer shown in its normal position.

Fig. 4 is an end elevation of the stop and retainer showing the face of the vacuum cup.

Fig. 5 is a sectional view taken on line V—V of Fig. 2.

Fig. 6 is a modified form of the door stop and retainer wherein the cup receiving end of the body of the stop is canted for adjusting the planar face of the suction cup relative to the surface of the member to be stopped and retained.

Fig. 7 is a further modification of the door stop and retainer wherein the body of the door stop is angled for attachment to the floor.

Throughout the various views like reference characters refer to similar parts and the numeral 10 designates a door hinged at 12 to the door jamb 14 which is a part of the building structure including the baseboard 16. This door mounting is typical of the majority of installations in residences and it will be noted that when the door is fully opened, it is positioned adjacent the side wall 18 which carries the baseboard 16.

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Due to the variation of the distance of the hinge 12 to the side wall 18, the angle of the door relative to the side wall varies, thus requiring an adjustment of the door engaging vacuum cup as hereinafter described.

The door stop and retainer 20 comprises a base or standard 22 having an elongated body 24 provided adjacent its attaching end with a flange 26 which rests against the baseboard 16 when the base screw 28, disposed in axial alignment with the body 24, is embedded therein. This screw 28 may be made integral with the body 24 of the base or may be previously formed and then moulded therein. The body member 24 is made sufficiently long to stop the door before the knob or other projections thereon strike the wall 18 and is provided adjacent its outer end with an annular flange 30 from which extends a forwardly projecting shank 32 which terminates in a flange or button 34. For convenience in driving screw 28 to position, the central portion of the base 22 is squared at 36 to receive a wrench or pliers. A suction cup 38 made of a pliable elastic material such as rubber, is provided with a base 40 carrying an outwardly flanged cup 42 having its outer edges in a plane substantially parallel with the end wall of the base 40 so as to engage a planar surface of a door and form a sealed pocket therebetween whereby to secure the door thereto.

Base 40 is recessed at 44 with an under-cut at 46 to form a pocket 48 for the reception of the button 34 and the shank 32 whereby the suction cup is removably and adjustably attached to base 22. The elastic qualities of the rubber suction cup permits the buttoning of the cup over the button 34 and the parts are so proportioned that when the cup is so positioned on the base, the parts will be snugly fitted together to prevent accidental relative movement thereof. Since in most instances the position of the door 10 to the wall 18 is not parallel, it is found necessary to adjust the rubber suction cup 38 relative to base 20 in order to position the plane of the face of the cup substantially parallel with the face of the door. By actual testing, it has been found that when the base of the door and the plane of the suction cup are disposed at too great an angle relative to each other, unequal stresses are set up in the flanged portion of the cup which will tend to release its grip on the door surface more quickly than when the parts are in substantially parallel relation.

The preferred form of means for adjusting the suction cup is shown in Figs. 1 to 5 inclusive and

also in Fig. 7, and comprises a wedge shaped washer 50 slotted at 52 inwardly from its thinner edge to fit about shank 32 between the rubber suction cup 38 and the base member flange 30. This washer 50, when forced to position, will cause a tilting of the vacuum cup to a position such as shown in Figs. 2 and 3 and when so positioned, the plane of the contacting surface of the suction cup will be substantially parallel with the planar face 54 of door 10. When the washer is so positioned, the portion of the suction cup adjacent the washer will be under compression and will exert sufficient force against said washer to maintain it in position against accidental removal. Furthermore, it will be noted that the washer 50 extends slightly beyond the base 40 of the suction cup and the outer periphery of flange 30 whereby it may be engaged and rotated to vary the angle of the working face of the suction cup.

It is quite apparent that with this structure the plane of the working face of the suction cup may be varied not only along a horizontal line, as shown in Fig. 2, and also from a vertical line, together with combinations of these two extremes which may be present in different degrees in actual use of the device.

It is quite apparent that when the door is swung to position, the suction cup will engage the door to stop the same and in so doing will cause a compression of the suction cup sufficient to create a vacuum in the pocket 56 formed between the suction cup and the door surface to secure the door against hinging movement except when sufficient force is applied to the door to overcome the suction cup action.

The modified view, shown in Fig. 6, contemplates the elimination of the wedge-shaped washer 50 by simply canting or tilting the outer flange 60, and also the shank 62 and button 64 of the base 22 to the major axis thereof. The vacuum cup member is made identically as that shown in the preferred form, except that the base surface thereof contacting flange 60 is formed at a non-perpendicular angle to the axis of said cup member, and said cup member may be rotated relative to the base member 22 to vary the angle of the planar face thereof relative to its supporting base.

A further modified form, shown in Fig. 7, provides for a base member 70 having a horizontally disposed head portion 72 and a vertically disposed body portion 74 provided with a horizontally disposed flange 76 suitable for receiving screws 78 by means of which the device is secured to the floor 80. It is quite apparent that when setting the door, the face of the suction cup may be adjusted substantially in parallel relation with the face of the door. However, to obtain more accurate positioning of these parts, the washer 50, constructed as described above, is positioned so as to hold the suction cup in proper relation. In using the door stop and retainer as shown in the preferred form and in Fig. 7, it is quite apparent that in cases where the fully open position of the door is in parallel relation with the wall 18, the washer 50 can be removed from the structure and the working face of the suction cup will then be at right angles to the base 22.

Having thus described my invention, what I claim as new and desire to be secured by Letters Patent is:

1. A door stop and retainer including a one-piece base member having means whereby it may

be fixed to a building structure carrying a hinged door; and a suction cup, having an engaging face, removably and adjustably carried by said base member, whereby the angle of said engaging face to the base member may be set to conform to the face of the door to be stopped.

2. A door stop and retainer including a one-piece base member adapted for fixed attachment to a building structure carrying a hinged door; a suction cup removably secured to the outer end portion of said base member; and means adjustable whereby the angle of the plane of the engaging face of said suction cup may be set at a predetermined angle relative to said base member.

3. A door stop and retainer including an elongated one-piece base member having integral means whereby it may be fixed to a baseboard; a suction cup removably engaging the outer end portion of said base member; and means adjustable on said base member whereby the plane of the working face of said suction cup to said base member may be set at a predetermined angle.

4. A door stop and retainer including an elongated base member having means whereby it may be fixed to a building structure carrying a hinged door; a button formed on the outer extremity of said base member; a suction cup recessed at its base to receive said button therein to secure the suction cup to said base; and a slotted wedge-shaped washer adjustable on said base member to engage and vary the angle of said suction cup relative to said base member.

5. A door stop and retainer including an elongated base member having means whereby it may be fixed to a building structure carrying a hinged door; a button formed on the outer extremity of said base member; a flange on said base member adjacent said button; a suction cup recessed at its base to receive said button therein to secure the suction cup to the base; and a wedge-shaped washer adjustable on said base member between said flange and suction cup to vary the angle of said suction cup relative to said base member whereby it is positioned to meet the face of the door being stopped.

6. A door stop and retainer including an elongated base member having means whereby it may be fixed to a building structure carrying a hinged door; a button formed on the outer extremity of said base member and disposed at an angle to said base member; a flange on said base member adjacent said button with its outer face at a right angle to the axis of said button; a suction cup recessed at its base to receive said button therein against said flange, the surface of said cup contacting said flange being formed at a non-perpendicular angle to the axis of said cup, whereby the angle of said cup relative to said base may be varied.

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