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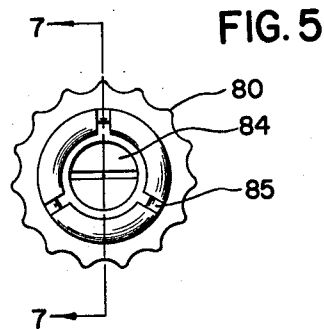
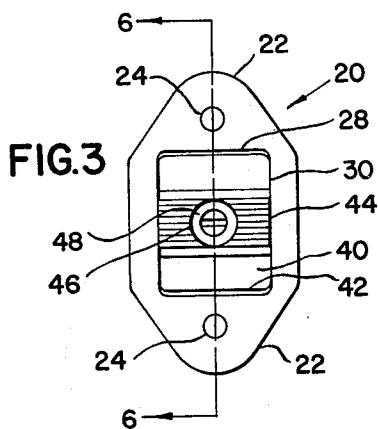
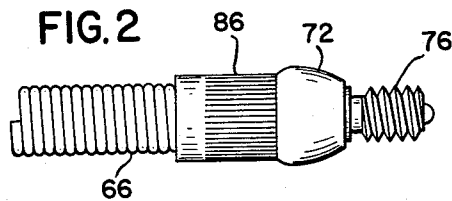
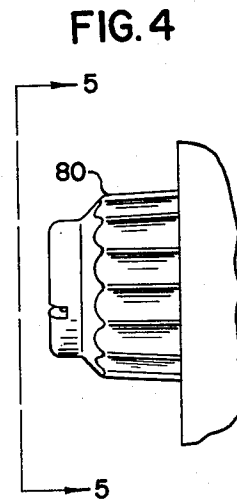
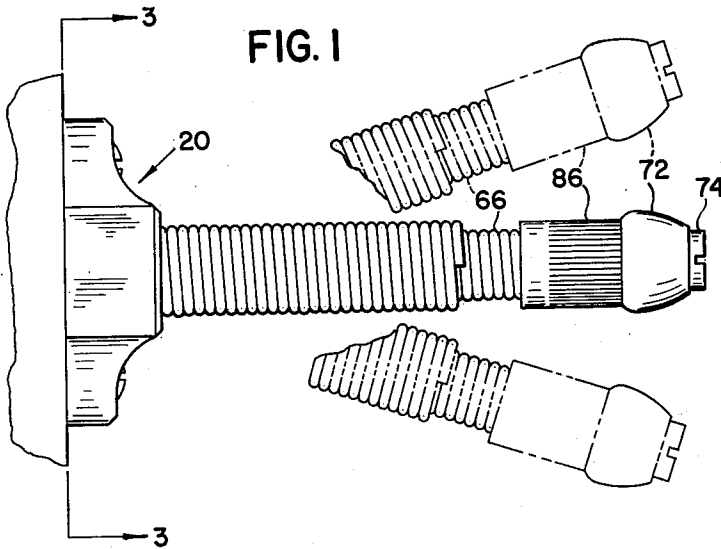
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DOOR STOP

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2 Sheets-Sheet 1



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DOOR STOP

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This invention relates to door stops and to combined door stopping and holding means, one object of the invention being to provide an improved device of this character comprising a laterally flexible coiled spring means for engagement between a door and wall, with means for adjusting and securing the angle of incidence between such spring means and the door or wall into engagement with which it is moved, to thereby insure properly aligned coincident engagement of the parts.

Door hinge axes are offset at varying distances from their frames and so occupy varying angular relations with an adjacent wall when moved to open position. Furthermore, the baseboard of such wall is commonly curved or inclined to the vertical. A further object, more specifically stated, is to provide a swiveling mounting for the spring means of the door stop, to secure its perpendicular incidence with the door or wall into engagement with which it is moved and accurate registry of the respective holding parts which may be employed.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

FIG. 1 is a top plan view of parts of a door stop means for mounting on a wall or door, illustrating the flexibility of the same;

FIG. 2 is a fragmentary view of parts shown in FIG. 1 as adjusted for marking the position of a cooperating part on a door or wall;

FIG. 3 is an end view of parts shown in FIG. 1 as viewed from the left;

FIG. 4 is a top plan view of a holding part for attachment to a door or wall for cooperating with the parts of FIG. 1;

FIG. 5 is an end view of the parts shown in FIG. 4 viewed from the left;

FIG. 6 is a sectional view of the parts shown in FIG. 1 on the line 6-6 in FIG. 3;

FIG. 7 is a sectional view on the line 7-7 in FIG. 5;

FIG. 8 is an end view of parts shown in FIG. 6 for limiting extension of the spring means thereof;

FIG. 9 is a fragmentary side elevation of parts shown in FIG. 8;

FIG. 10 is a section on the line 10-10 of FIG. 9;

FIG. 11 is a partially sectional view of a modification of parts shown in FIG. 6;

FIG. 12 is an enlarged end view of parts shown in FIG. 11 as viewed from the left;

FIG. 13 is an enlarged, sectional view of parts shown in FIG. 11, and

FIG. 14 is an enlarged, fragmentary view of part of the spring means shown in FIG. 6.

The present invention provides a door stop comprising a flexible, coiled wire spring means for attachment to a door or wall and to the combination thereof with means for attachment to a door or wall for releasably holding a door in open position. The embodiment of the invention shown in FIGS. 1 to 6, inclusive, comprises a mounting part 20 having wings or ends 22 formed with openings, as 24, for the reception of screws 26 for securing a flat base of the part to a wall or door, it being understood that the door stop is adapted for mounting

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on either one of a wall or door for cooperation with the other.

Mounting part 20 may be molded of plastic or metal and formed through its base with a recess 28 having an arcuate shape extending endwise of base 20, as shown, the other sides 30 of the recess being perpendicular to the plane of the base. The recess is formed at its bottom with an opening 32 for the extension therethrough of the spring means of the stop and the arcuate walls of the recess are preferably formed with small gripping ridges 34 for a purpose hereafter described.

The laterally flexible coiled spring means comprises a coiled portion 36 wound under tension with adjacent coils in contact with each other. One end of this coil is tightly fitted, as by rotation in the direction of winding, to the outside of the reduced portion 38 of a mounting element 40 having arcuate ends 42, this element having a shape conforming to that of the recess in part 20, so that it has a horizontal swiveling or pivotal adjustment in such recess. Element 40 has a substantially arcuate enlargement 44 formed with small transverse gripping ridges, as shown, for engagement with the wall or door, to lock the part 40 in adjusted position in the recess of part 20 when its screws 26 are tightened home. Enlargement 44 is formed centrally with an opening or bore 46 extending in varying shape through the other end of part 40. The outer end of bore 46 is cylindrical and a sleeve 43 is inserted therein for a purpose hereafter described.

Part 40 is formed inwardly of bore 46 with a portion 50 of hexagonal shape for the sliding reception of a hexagonal head 52 (FIGS. 8, 9 and 10). Head 52 is formed with a slotted end 54 and with a central opening 56 for the reception of one end of a flexible anchoring wire 58 having its extremity looped, as at 60, to fit in slot 54 and hold the wire against turning. Sleeve 43 has an internal diameter smaller than the head and is driven and frictionally secured in the opening 46 of part 40, to limit the movement of head 52 in one direction. The other end of head 52 bears against a short coiled spring 62 between it and an inwardly shouldered portion at the inner end of part 40, to allow a limited movement of the head in its bore and of wire 58, as hereafter referred to. Wire 58 extends from head 52 through spring 62 and an opening in the inner end of part 40, with its other end fixed in a threaded plug 64, hereafter referred to.

The other end of flexible spring 36 is threadedly engaged with a rigid wire coil 66, similarly wound under tension but with its adjoining coils fixed in contact with each other by covering with a metallic coating 68 to secure the same together (FIG. 14). A coating of copper, fused as by a hydrogen braze treatment has been found satisfactory for this purpose. Plug 64 is threadedly engaged in and with the coil 66 for the purpose of limiting the extension of flexible coil 36 under tension produced by pulling or disengagement of its other end from cooperating holding means on a door or wall, as hereafter described.

The outer end of coil 66 has molded or threaded thereon a plastic or metal sleeve 70 (FIG. 6) with an enlarged and cone-shaped end 72 for engagement with a cooperating holding part on a door or wall. A stud 74 has a threaded end 76 adjustably threaded in and with the coils of rigid coil 66. The outer end of stud 74 is slotted, as shown, for engagement by a screwdriver to turn it in coil 66 and so adjust its degree of projection beyond the outer end of sleeve 70, to limit the degree of entry of sleeve cone 72 into the cooperating holding part (FIG. 7) on the door or wall. The inner end of stud 74 is also formed with a small central point 78 adapted to be posi-

tioned outwardly by reversing the position of stud 74 in sleeve 70, as shown in FIG. 2. With the stud in this position, a light impact of the above mounted spring means against a door or wall, leaves a guide mark for the accurately aligned mounting of the cooperating holding part 80 (FIG. 7) on the door or wall.

The holding part 80 is preferably molded of resilient plastic material with a recess 82 having a central hole in its bottom for reception of a screw 84 for securing its flat base against the surface of a door or wall. The part 80 is thus formed with a relatively thin rim indented by spaced slots 85 to afford some yielding expansion during entry of the cone 72 of sleeve 70 of the spring means. Cone 72 terminates at its larger end in a shoulder 86 which engages within the rim of part 80 to releasably hold these parts in engagement with each other and hold the door in open position.

In operation, with one or more of screws 26 loosened to release element 40 from the engagement of its projection 44 with the surface of the wall or door, the parts of the spring means are pivotally adjusted in part 20 to locate the same in horizontal position. Screws 26 are then turned home to engage projection 44 with the surface of the wall or door and thus secure or lock the spring means in such adjusted position. Plug 74 is reversed (FIG. 2) and a slight dent made by engagement with the surface of the door or wall to locate the cooperating part 80.

With the part 80 thus accurately located in mating relation and with plug 74 reversed (FIG. 6), movement of the door brings cone 72 of the spring means into engagement in the recess of part 80 and so holds the door in open position. On movement of the door, to release it for closing, cone 72 is pulled free of part 80, but without extension of spring 36 which is held by anchoring engagement of head 64 in rigid coil 66, except for such yielding of the small spring 62 as desirable to accommodate any bending of coil 36.

In the modification of FIGS. 11 and 12 the part 20 for attachment to the wall or door described above is replaced by a part 90 of circular shape having a plurality of openings for screws 92 for securing its flat bottom to the surface of the wall or door. Part 90 is formed with a recess 94 which, instead of being arcuate as above, is of spherical shape, with a plurality of low circular gripping ridges 96. An opening 98 through the bottom of the recess loosely receives the reduced portion 100 of a mounting element 102 of spherical shape conforming to and fitting in the recess of part 90. Element 102 and its portion 100 have a central opening therethrough enlarged at one end to receive and frictionally retain a button 104 having a projecting outer end formed with small concentric gripping ridges 106 adapted to slightly indent and frictionally grip the surface of the wall or door when the screws 92 are turned home to tighten part 90 against the wall or door surface, thus securing body 102 in adjusted angular position in the recess of part 90, assisted by the frictional resistance afforded by the ridges 96.

The central opening through element 102 is formed adjacent its other end with a hexagonal shape in which a hexagonal head 108 is slidably received and held against rotation, as in the case of the head 52 of the first modification. The opening through element 102 is closed at its inner end except for a small opening for the reception of a flexible wire 110 having one end fixed to the head 108 in mounting element 102. Wire 110 extends through flexible and rigid wire coils as described above in the first modification and has on its other end a plug 112 threadedly engaged in the turns of the rigid coil, these parts being the same as described above in connection with the first modification, including a plug similar to stud 74 of the first modification.

In both modifications, the adjoining wire turns of the rigid coil are fixed together by a coating 68 of copper

or other metal (FIG. 14) fused by the known hydrogen braze process so as to form, in effect, a rigid sleeve with screw threaded inner and outer surfaces as shown. Both modifications may be employed either as a stop, or, in conjunction with a holding part such as part 80 (FIG. 7).

The invention thus provides a stop of flexible coil spring type, adapted to yield under contact with a foot or other object. Such spring means is mounted for swiveling adjustment of its position, laterally in the modification of FIG. 6 or universally in the modification of FIG. 11, as desirable to accommodate mounting on curved base parts of walls or varying distances of door hinge axes from their frames, thus introducing angular variance between a door and the base part of a wall. With the spring means adjusted for perpendicular incidence with the door, the latter is conveniently marked for location of the cooperating holding part, and plug 74 provides adjustment of the degree of releasing resistance of cone 72 with the recess of part 80.

The invention thus provides a stop or stop and holding mechanism convenient to mount for use and conveniently adjustable in its several parts for adaptation to the particular conditions of its installation, as well as for varying the force desired for door holding and release.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of preferred embodiments, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention or the scope of the appended claims.

I claim:

1. A door stop assembly for attachment to a substantially planiform mounting surface of wood material or the like comprising a door stop member including an axially elongated, laterally flexible, coiled wire spring having outer and rear ends to be respectively disposed remote from and adjacent to said surface, a buffer head on said outer end for contacting a relatively movable object to be stopped, and a swivel base formation fixed to the rear end of said spring including surface portions of convex arcuate cross-section substantially centered about the longitudinal axis of said spring facing generally toward said outer end and a rearwardly projecting locking head of substantially semicircular cross-section to engage said surface when said door stop member is mounted thereon, said locking head having a plurality of surface penetrating sharp ridges projecting rearwardly therefrom at positions spaced different radial distances from an extension of said axis, said ridges being formed of a material of sufficient hardness to bite into said surface, a mounting base member having an apertured socket receiving said swivel base formation therein in angularly adjustable relation therewith for adjustment of said stop member to a plurality of angular positions relative to said surface and a rear planiform wall for abutment with said surface having an opening through which a portion of said locking head projects, and fastening means extendable through said base member and into said surface for drawing said rear wall of said base member against said surface and forcing the ridges on said head projecting rearwardly through said opening into said surface to hold said stop member against displacement from its position of angular adjustment.

2. A door stop assembly as defined in claim 1, wherein said rearwardly projecting locking head is of rearwardly facing substantially semi-cylindrical configuration elongated axially along and defined about a reference axis lying perpendicular to said longitudinal axis of said spring, and said ridges extend the axial length of said locking head along rectilinear axes paralleling said reference axis, and said socket of said base member and

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said surface portions being shaped to accommodate angular adjustment of said stop member about an axis paralleling said reference axis.

3. A door stop assembly as defined in claim 1, wherein said surface portions of said swivel base formation define a spherical zone concentric with said longitudinal axis and said locking head is of substantial hemispherical configuration concentric with said longitudinal axis, and wherein said ridges lie in circular paths concentric with an extension of said longitudinal axis, and said socket of said base member and said surface portions coacting to accommodate universal adjustment of said stop member to said plurality of angular positions, relative to said mounting surface.

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