United States Patent

Walker et al.

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[45] **Sept. 26, 1972**

[54] **LADDER STABILIZER**

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[52] **U.S. Cl.** **182/129,** 182/111, 182/129

[51] **Int. Cl.** **E06c 7/14,** E06c 7/48

[58] **Field of Search**.....182/214, 107, 108, 111, 129, 182/229

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[57] **ABSTRACT**

A stabilizer for supporting a ladder formed of a U-shaped frame of extruded tubing of diamond shaped cross section providing a flat clamping surface cocked at an angle to the plane of the frame and which is clamped to the upright members of a ladder so as to be automatically oriented in horizontal position to press at right angles against the wall of the building when the ladder is in its normal working position. Pivoted feet are provided at the ends of the frame held resiliently in a centered, wall engaging, position but capable of rocking movement for self alinement with angled wall surfaces. Each foot is fitted with a rubber pad surfaced to prevent slipping in any direction. The diamond cross section provides an adjacent clamping surface which is parallel to the plane of the frame for permitting the frame to be clamped parallel to the upright members of the ladder to provide lateral outboard support. The frame is fitted with a pair of parallel rods for slidable reception of a rectangular tray.

7 Claims, 8 Drawing Figures

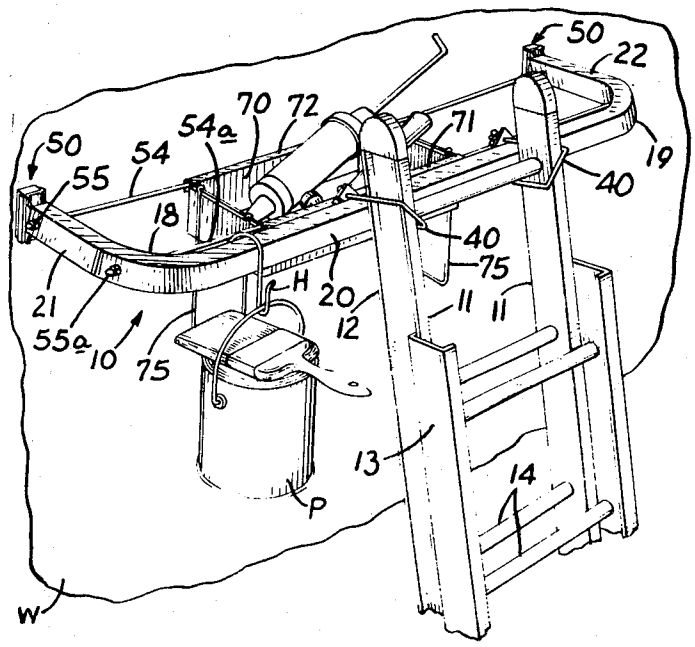


FIG. 1

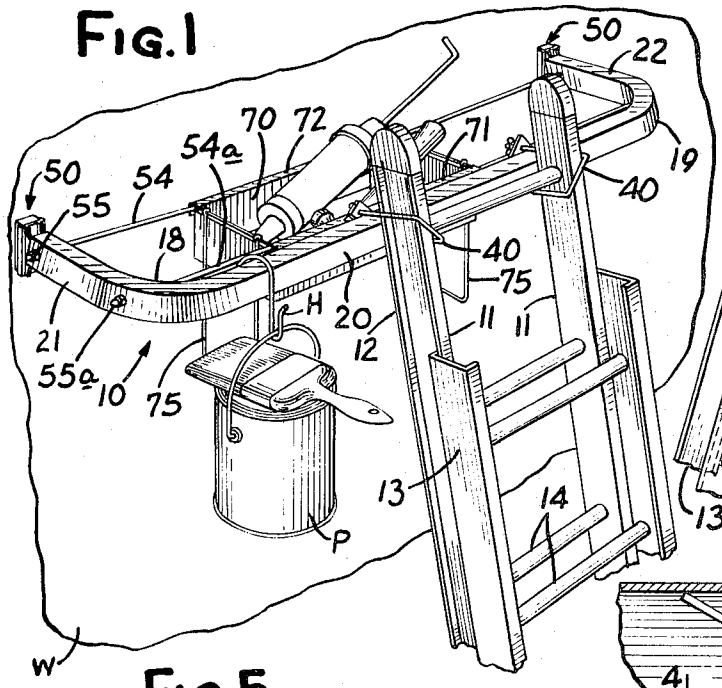


FIG. 2

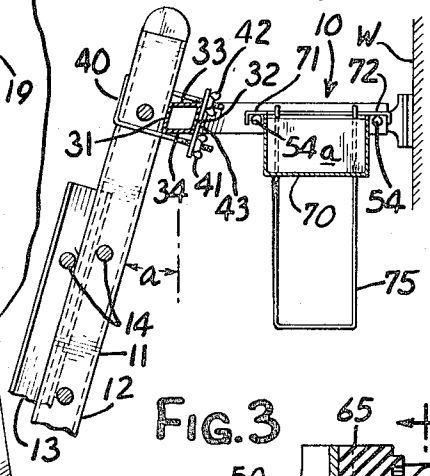


FIG. 3

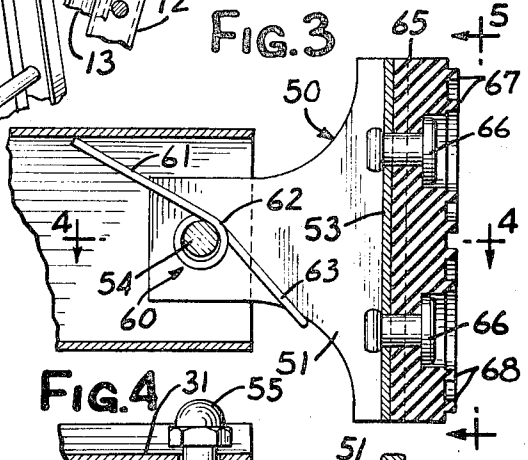


FIG. 5

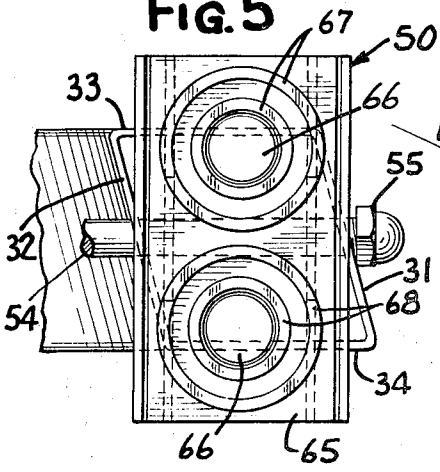


FIG. 7

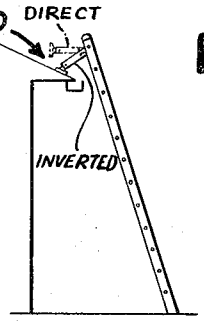


FIG. 4

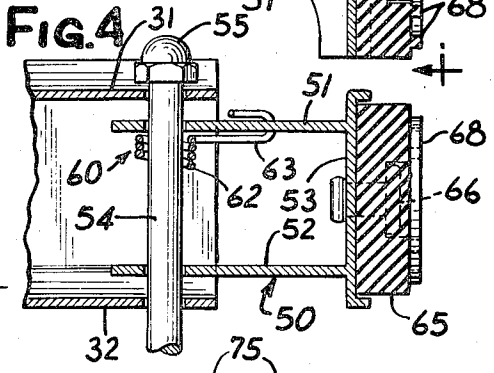


FIG. 8

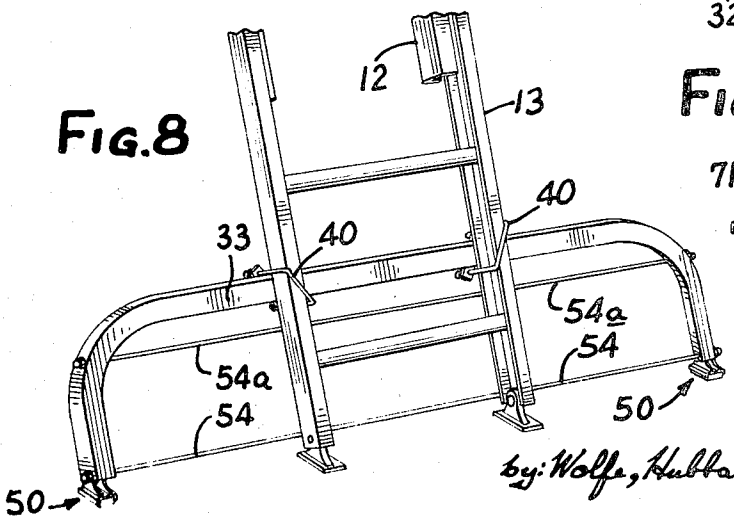
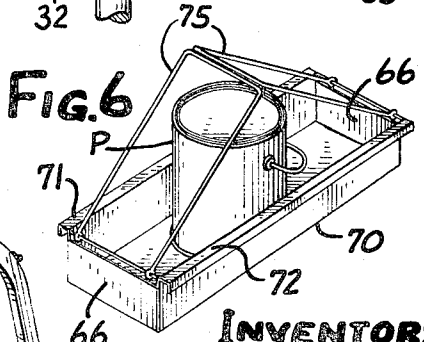


FIG. 6



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LADDER STABILIZER

It is an object of the present invention to provide a stabilizer which is safer and more convenient than conventional devices, which assumes proper orientation on the ladder simply by clamping in place without exercise of any particular care or attention on the part of the user, and which is easily and quickly installed and removed. More specifically it is an object of the present invention to provide a ladder stabilizer which is formed of a single length of extruded tubing of special cross section which provides a clamping surface along the length thereof cocked at a predetermined angle to insure horizontal projection and which provides a convenient supporting surface for materials used by a painter, tuckpointer or other artisan.

It is a related object of the present invention to provide a ladder stabilizer formed of a length of extruded tubing which has an auxiliary clamping surface which lies parallel to the plane of the device permitting the stabilizer to be positioned parallel to the plane of the ladder to provide outboard lateral support.

It is an object of the invention, in one of its detailed aspects, to provide a stabilizer having a tray or carrier for convenient support of tools and materials at any point along the length of the stabilizer.

It is a general object to provide a ladder stabilizer which may be manufactured at a cost sufficiently low as to extend its market to householders and others requiring safety in occasional usage.

Other objects and advantages of the invention will become apparent upon reading the attached detailed description and upon reference to the drawing in which:

FIG. 1 is a perspective view showing the stabilizer secured to the upper end of a ladder in working position.

FIG. 2 is a vertical section taken through the structure shown in FIG. 1.

FIG. 3 is a fragmentary cross section taken through one of the legs of the stabilizer and showing a supporting foot.

FIG. 4 is a fragmentary section looking along the line 4—4 in FIG. 3.

FIG. 5 is a face view of the foot looking along the line 5—5 in FIG. 3.

FIG. 6 is a perspective view showing the tray construction.

FIG. 7 is a diagram, at reduced scale, showing inverted mounting of the stabilizer for roof engagement.

FIG. 8 shows the stabilizer employed for outboard support at the foot of the ladder.

While the invention has been described in connection with a preferred embodiment, it will be understood that I do not intend to limit the invention to the particular embodiment shown but intend to cover the various alternative and equivalent constructions included within the spirit and scope of the appended claims.

Turning now to the drawing, FIGS. 1 and 2 show a stabilizer **10** secured to the upright members **11** of an extension ladder having extensible sections **12**, **13** fitted with the usual rungs **14**. Suitable locking means (not shown) are provided for keeping the sections **12**, **13** of the ladder locked in any desired extended position.

In accordance with the present invention the stabilizer is formed of an extruded tube of aluminum or the like bent into U-shape and with the cross section of the tube being such as to provide a flat mounting face, or clamping surface, which is cocked at an angle with respect to the plane of the stabilizer so that when the stabilizer is clamped to the upright members of the ladder, the stabilizer will, when the ladder is in its inclined working position, automatically assume horizontal orientation for pressing against the wall of a building and to serve simultaneously as a horizontal support for the tools and materials of the workman. As shown in the drawing the extruded tube is formed into a frame by bending at **18**, **19** to define a cross member **20**, having a length which substantially exceeds the width of the ladder, as well as projecting legs **21**, **22**. The legs occupy a common plane and are parallel to one another, but the legs may be slightly divergent, if desired, without departing from the present invention.

More specifically in accordance with the invention the tubing of which the device is formed is diamond-shaped in cross section, as shown in FIG. **2**, with a total of four surfaces. The first surface **31**, which serves as a presented clamping face, is cocked at an angle to the plane of the device, an angle which is on the order of 75°. The angle may be conveniently related, as at *a*, to a line which is perpendicular to the frame and which corresponds to the normal tilting of the ladder from the vertical, an angle of about **15** degrees when the ladder is in its working position, thereby insuring that the stabilizer extends at right angles into engagement with the building wall indicated at W. Arranged parallel to the clamping surface **31** is an oppositely facing surface **32** which is parallel thereto. The remaining surfaces of the extrusion, indicated at **33**, **34** are arranged parallel to the plane of the device.

For the purpose of clamping the stabilizer to the ladder, a pair of U-bolts **40** are used, having wing nuts **41**, **42** which press upon a registering clamping plate **43**. To assemble the device it is a simple matter to slip the U-bolts over the upright members of the ladder, in angled position so that they extend beyond the cross members **20**, after which the plate **43** and nuts **41**, **42** are assembled and turned tight. Finger tightness is adequate to prevent slippage. The uprights of the ladder are preferably centered with respect to the cross member **20** but may be offset to one side or the other as desired.

In carrying out the invention the feet of the stabilizer are provided with shoes which are resiliently held in a vertical position for engagement with a vertical wall surface but which are free to rock in one direction or the other for self-accomodation to angled surfaces such as overlapped siding, shingles, or shakes. Referring to FIGS. **3** and **4**, a shoe, indicated at **50**, is made up of a short length of extrusion having a bracket in the form of walls **51**, **52** spaced parallel to one another and which are integral with a sole **53**. For the purpose of pivoting the shoe a rod **54** extends (see FIG. **4**) through mated openings in the walls **31**, **32** and **51**, **52**, the rod being made captive by a nut **55** threaded to the end of the rod. The shoe is supported in horizontal position (FIG. **3**) by a length of spring **60** having a first end **61**, a series of convolutions **62** which surround the rod **54**, and a lower or hooked end **63** which is hooked under the member **51**. The spring **60** is strong enough to support the weight of the shoe in the position shown while

permitting the shoe to rock either upwardly or downwardly as it conformingly engages the building wall.

To inhibit sliding movement of the shoe with respect to the wall surface in any direction, and to protect the surface, the shoe **50** is provided with a pad **65** of soft rubber or rubber-like material secured to the sole **53** by recessed rivets **66** and which has sets of circular ridges **67, 68** integrally molded therein. It is found that the circular nature of the ridges tends to inhibit slippage in all directions, either upwardly or downwardly or to the side, on the wall surface.

It is one of the further features of the construction that rods are provided extending between the legs **21, 22**, and arranged parallel to one another, for the purpose of slidably supporting a tray having rod-engaging flanges formed along its lateral edges. The rods, indicated at **54, 54*a***, and held in place by nuts **55, 55*a*** at the ends, support a tray **70** of rectangular configuration having integrally formed and downwardly-turned supporting flanges **71, 72** along the lateral edges, the tray **70** being dimensioned to fit more or less snugly between the rods. As shown in FIG. **1** the tray may be employed to hold tools such as caulking guns or a quantity of sand paper or any other material needed by the user. The tray may be centered with respect to the ladder and pushed to one side or the other as convenient.

Also, as convenient, a bucket of paint P may be suspended by a hook H at any point along the cross member **20**. For transport the bucket may be supported in the tray well as shown in FIG. **6**. To facilitate single handed transport of the tray, particularly when ascending the ladder, the tray is provided with two bails **75**, of rectangular configuration, which are pivoted to the ends of the tray and which, folded together, form an arch as shown in FIG. **6**. When grasped by the bails, the tray is well balanced, with the centering action of the bails tending to crowd the load, typically a gallon bucket of paint, into centered position, and hence secure, as the ladder is ascended. The bails are tailored, in width, so that they may be swung outwardly and downwardly between the rods **54, 54*a*** to a suspended, out-of-the-way position adjacent the ends of the tray.

While the ladder stabilizer is shown, in FIG. **1**, as mounted at the top of an extension type ladder, it will be apparent that in painting a low building a single ladder section having uprights **11** will suffice. In such circumstances the stabilizer may be mounted at the top of the ladder for the initial pass and then secured at a somewhat lower level on the ladder for the second or successive passes. Since the paint bucket and tools or equipment may be used first at one end of the stabilizer and then at the other simply by sliding the tray along the rods, a wider vertical strip may be safely covered at a single position of the ladder than is possible where no stabilizer is used or where a stabilizer of conventional design is employed.

The projection of the legs **21, 22** may in many cases be sufficient to permit the stabilizer to rest against the side of the building even though the ladder may project upwardly beyond the gutter level. However, it is one of the features and advantages of the construction that it may be clamped to the ladder either in direct position, as described, or in inverted position as shown in FIG. **7**, with the stabilizer angling downwardly into engagement with the roof of the building and with the ladder arching over the gutter. This is particularly desirable where the gutters are formed of extremely light metal, such as thin aluminum, or where the gutters are poorly supported. The non-slip pads **65**, in such usage, again tend to insure against relative slippage. While it is true that in the inverted usage shown in FIG. **7** there may be a strain upon the stabilizer as, for example, where the lower end of the ladder sinks into soft ground, it is found that the diamond cross section of the stabilizer tubing provides a solid seat combined with a high degree of torsional rigidity so that the stabilizer does not tend to become deformed at the region of engagement with the ladder uprights nor tend to twist bodily out of its normal plane.

As stated, it is one of the further features of the construction that it may be rotated parallel to the plane of the ladder and then secured to the upright members to provide lateral outboard support against tipping of the ladder sideways in one direction or the other. For example, the stabilizer **10** may be mounted at the foot of the ladder with the surface **33** of the cross member in clamping engagement and with the shoes **50** at each end of the stabilizer in contact with the ground or in contact with a suitable upraised support or platform which is, in turn, supported at ground level. This is particularly advantagous to prevent slippage of the ladder under conditions of poor ground support, where the upper end of the ladder cannot be securely positioned, and especially where the ladder is extended to nearly its full length. Indeed, use of the stabilizer in the manner shown in FIG. **8** makes it unnecessary to have an assistant where an assistant might otherwise be considered necessary to hold the ladder stationary while the work is being done aloft. The rods **54, 54*a*** perform a useful bracing function preventing the stabilizer from being bent or spread when subjected to severe loading, as, for example, where the ladder must be supported by the feet of the stabilizer acting alone.

The present design of the stabilizer, in spite of its versatility and operating features, is nevertheless cheaper to manufacture than conventional stabilizers. The frame is essentially of one piece construction, and it involves no more expense to extrude the tubing in a diamond-shaped cross section than it does to extrude the tubing in a square or circular form. The structure thus takes inherent advantage of the angle of cocking which characterizes the diamond shape. The only other parts required are the feet which are pinned to the legs by the same rod **54** which performs the tray supporting function, with the structure being additionally braced by the second supporting rod **54*a***. The U-bolts which clamp the stabilizer in place form a negligible element of cost. Consequently the stabilizer unit may be priced at a level which permits purchase by householders and other casual users of a ladder who are generally inclined to feel that they cannot afford a device of this kind but who, because of lack of experience, have need of the safety features which the structure provides.

While a flat clamping surface **31** is preferred, it will be understood that such surface need not be perfectly smooth as long as it establishes a plane of clamping which is cocked with respect to the frame.

The term "tubular" while generally referring to a completely enclosed tube is not necessarily limited thereto and includes within its scope hollow structural members which may be at least partially open sided.

It is one of the features of the stabilizer construction that self-leveling results in a level tray which is important in working with paint cans of less than gallon size which, lacking a bail, require flat and level support.

What I claim is:

1. A ladder stabilizer intended for clamping to the upper or lower portions of the upright members of a ladder comprising, in combination, a tubular frame formed into U-shape to define two projecting legs and an integral cross member, the latter substantially exceeding the width of the ladder, feet at the ends of the respective legs each having a non-skid surface for presentation to the wall of a building, the tubular frame being shaped in cross section to define a flat clamping surface extending along the length thereof for face to face engagement with the upper portion of said upright members, which clamping surface is cocked at an angle to the plane of the frame so that when the ladder is in its normal inclined working position the frame extends horizontally therefrom for engagement with the wall or roof of the building, said tubular frame having an auxiliary flat clamping surface extending along the length of at least the cross member and lying parallel to the plane of the frame for clamping in face to face engagement with the lower portion of said upright members to provide lateral outboard support when the ladder is in its normally inclined working position, and means for clamping either of said clamping surfaces to the upright members of the ladder.

2. A ladder stabilizer as claimed in claim 7 in which the feet are pivoted to the ends of the legs for limited rocking movement about a horizontal axis and in which each foot has an associated spring for maintaining the same resiliently centered with respect to the associated leg and positioned to engage a supporting wall surface at right angles to the plane of the frame while permitting self-accommodation to an angled wall surface.

3. The ladder stabilizer as claimed in claim 7 in which the feet at the ends of the respective legs are fitted with rubber pads having a circularly ridged surface for inhibiting skidding movement in any direction along the wall of the building.

4. A ladder stabilizer intended for clamping to the upright members of a ladder comprising, in combination, a frame of tubular cross section formed into U-shape to define two projecting legs and an integral cross member which substantially exceeds the width of the ladder, feet at the ends of the respective legs each having a surface for presentation to the wall of a building, means for clamping the cross member of the frame to the vertical members of the ladder, the cross member having a flat clamping surface extending along the length thereof for face to face engagement with the upright members and which is cocked at an angle to the plane of the frame so that when the ladder is in its normally inclined working position the frame extends horizontally therefrom for engagement with the wall of the building, the cross member further having an adjacent auxiliary clamping surface which is parallel to the plane of the frame so that when the frame is clamped to the lower end of the ladder with the auxiliary clamping surface in engagement with the upright members and with the feet in engagement with the ground, outboard lateral support is provided, in the plane of the ladder, against sidewise movement of the ladder in either direction.

5. A ladder stabilizer intended for clamping to the upright members of a ladder comprising, in combination, a frame of tubular cross section formed into U-shape to define two projecting legs and an integral cross member which substantially exceeds the width of the ladder, feet at the ends of the respective legs each having a surface for presentation to the wall of a building, means for clamping the cross member of the frame to the vertical members of the ladder, the cross member having a flat clamping surface extending along the length thereof for face to face engagement with the upright members and which is cocked at an angle to the plane of the frame so that when the ladder is in its normally inclined working position the frame extends horizontally therefrom for engagement with the wall of the building, the frame further including a pair of spaced reinforcing rods extending parallel to one another from one of the legs to the other and in which a shallow rectangular tray is provided having means on its lateral edges for registering with the rods for sliding of the tray horizontally from one end of the frame to the other.

6. The combination as claimed in claim 5 in which the tray is provided with a pair of bails secured to the tray at the opposite ends thereof and having a length such that they meet at the middle of the tray in arching configuration for single handed gripping to hold a can of paint in the tray for transport, the bails having a width which is less than the spacing between the rods so that the bails may be swung outwardly and downwardly to an out of the way position when the tray is mounded on the rods.

7. A ladder stabilizer intended for clamping to the upright members of a ladder comprising, in combination, a tubular frame formed into U-shape to define two projecting legs and an integral cross member, the latter substantially exceeding the width of the ladder, feet at the ends of the respective legs each having a surface for presentation to the wall of a building, means for clamping the cross member of the frame to the upright members of the ladder, a shallow tray, means for slidably mounting the tray upon the frame, said mounting means extending from one leg to the other whereby said tray may be moved from one leg of the frame to the other, the cross member having a flat clamping surface extending along the length thereof for engagement with the upright members of the ladder and which is cocked at an angle to the plane of the frame so that when the ladder is in its normal working position inclined from the vertical the frame extends horizontally therefrom for engagement with the wall of the building, thereby holding the tray horizontal for support of open cans of paint or the like.

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