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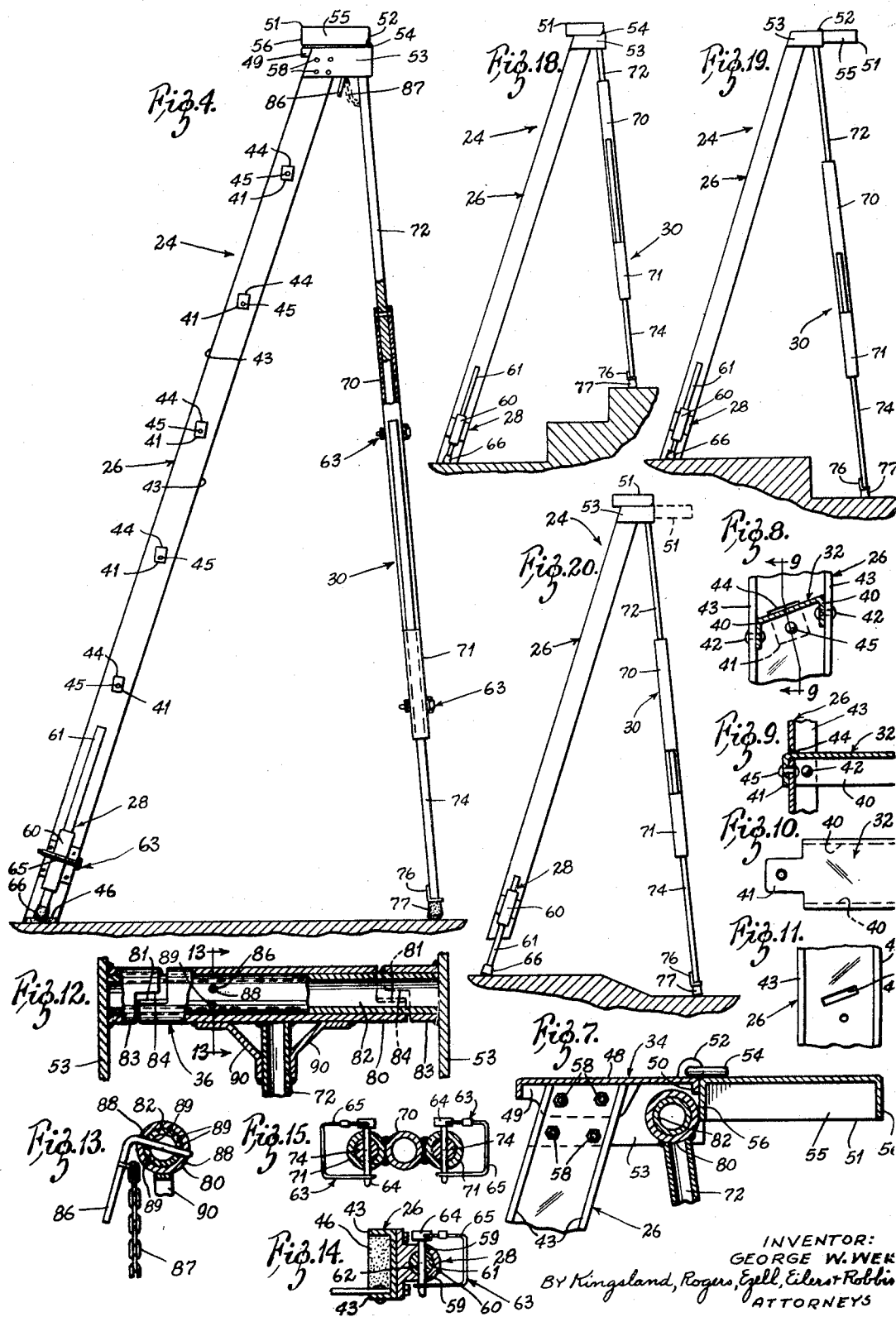
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MULTI-ADJUSTABLE STEPLADDER AND THE LIKE

Filed Aug. 14, 1967

3 Sheets-Sheet 2



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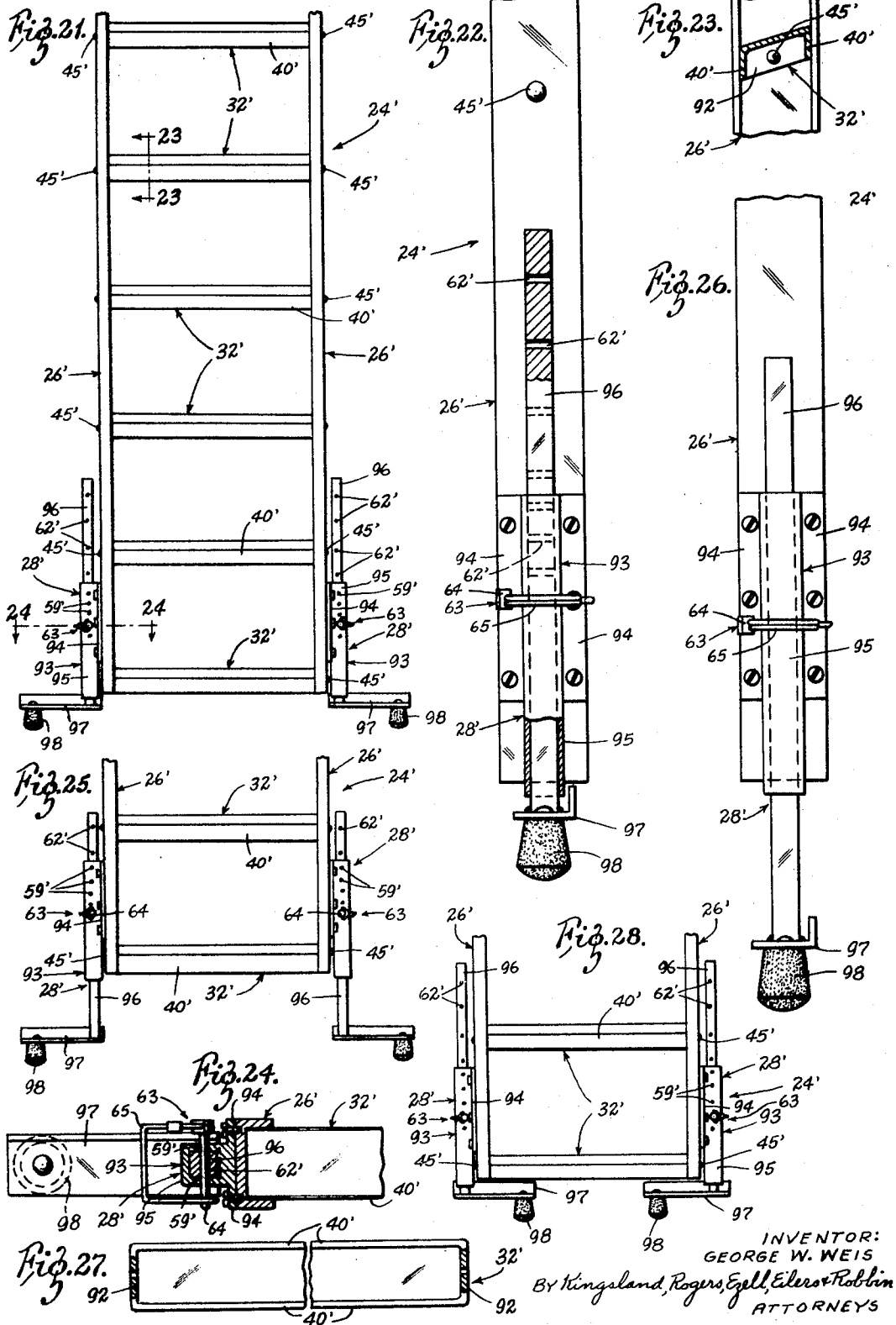
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MULTI-ADJUSTABLE STEPLADDER AND THE LIKE

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7 Claims

ABSTRACT OF THE DISCLOSURE

A multi-adjustable sturdy stepladder, and the like, to provide level placement thereof on rough or multi-level terrain including two main legs which may converge upwardly or be parallel, steps engaging said legs, an adjustable auxiliary leg for each main leg, and two individually and simultaneously adjustable rear legs, a pivoted top platform, and a pivoted lockable construction at the top of the rear legs adjacent the tops of the main legs.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates generally to the ladder art, and more particularly to a novel multi-adjustable stepladder, and the like.

Description of the prior art

Heretofore, many stepladders have been devised of various configurations and for various purposes. However, the building construction trade and others have long required, and the present device supplies, a sturdy stepladder multi-adjustable for leveling purposes incorporating a sturdy juncture for the front and rear legs.

SMUMARY OF THE INVENTION

In brief, the present novel stepladder includes two main legs, each being provided with an adjustable auxiliary leg for leveling purposes, sturdy individually and together adjustable rear legs, a juncture structure for the front and rear legs including a sturdy platform having a pivotal section for increasing the size thereof, and a sturdy mounting structure for the upper end of the rear legs including stop and blocking means for maintaining the ladder in fully open and closed positions.

Objects of the present invention are to provide a novel multi-adjustable stepladder which supplies the long felt need of the ladder art, which incorporates individual adjustable construction for each leg so that the ladder can be placed level on rough or multi-level terrain, which is of rugged and sturdy construction throughout, which can be locked in use and nonuse positions, and which otherwise fulfills the objects and advantages sought therefor.

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is a front elevational view of an embodiment of the present novel stepladder in folded or inoperative position;

FIGURE 2 is a side or end elevational view of the ladder of FIGURE 1;

FIGURE 3 is a rear elevational view thereof;

FIGURE 4 is a side elevational view thereof in fully expanded operational position on a level surface;

FIGURE 5 is an enlarged transverse vertical cross-sectional view taken on substantially the line 5—5 of FIGURE 1;

FIGURE 6 is a view similar to FIGURE 5, but with the ladder in the position of FIGURE 4;

FIGURE 7 is a view similar to FIGURE 6, but with the platform pivoted to open position;

FIGURE 8 is an enlarged fragmentary vertical transverse cross-sectional view taken on substantially the line 8—8 of FIGURE 1;

FIGURE 9 is a vertical cross-sectional view taken on substantially the line 9—9 of FIGURES 2 and 8;

FIGURE 10 is a plan view of one end of a step prior to bending over of the end mounting tab;

FIGURE 11 is a view similar to FIGURE 8, but with the step and mounting elements removed to illustrate the slot and aperture;

FIGURE 12 is an enlarged vertical longitudinal cross-sectional view, partly in elevation, through the mounting construction between the upper end of the rear legs construction and the platform;

FIGURE 13 is a fragmentary vertical transverse cross-sectional view taken on substantially the line 13—13 of FIGURE 12;

FIGURE 14 is an enlarged horizontal cross-sectional view taken on substantially the line 14—14 of FIGURE 1;

FIGURE 15 is an enlarged horizontal cross-sectional view taken on substantially the line 15—15 of FIGURE 1;

FIGURE 16 is an enlarged plan view of a latching element;

FIGURE 17 is an end view thereof, looking upward in FIGURE 16;

FIGURES 18—20 schematically illustrate the ladder of FIGURES 1—17 in various positions of adjustment to obtain level positions;

FIGURE 21 is a front elevational view of a modification of the present invention, the upper portion of the rear legs being omitted;

FIGURE 22 is an enlarged side or end elevational view, partly in section, of the structure of FIGURE 21;

FIGURE 23 is an enlarged vertical cross-sectional view taken on substantially the line 23—23 of FIGURE 21;

FIGURE 24 is an enlarged horizontal cross-sectional view taken on substantially the line 24—24 of FIGURE 21;

FIGURE 25 is a view similar to FIGURE 21 showing the auxiliary legs lowered;

FIGURE 26 is a view similar to FIGURE 22, but with the rear auxiliary leg lowered and showing further details;

FIGURE 27 is a bottom plan view of a step, partly in section, broken away centrally for conservation of space;

FIGURE 28 is a view similar to FIGURE 21 with the auxiliary legs rotated to carry or storage positions.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGURES 1—20 of the drawings more particularly by reference numerals, 24 indicates generally a stepladder constructed in accordance with the teachings of the present invention. Broadly, the stepladder 24 includes main front legs 26, auxiliary front leg units 28, a rear legs unit 30, steps 32, a platform 34, and a mounting construction 36 for pivotally attaching the rear legs unit 30 to the platform 34.

The main front legs 26 are of channel cross section and support the steps 32, which are of decreasing length from bottom to top, as illustrated, although for some structures, the steps 32 may be of the same length, see FIGURES 21—28 described below. A step 32 may be provided at the lower ends of the legs 26, if desired, as illustrated in FIGURE 32. Each step 21 includes side flanges 40 and a tab 41 at each end. The flanges 40 are secured by rivets 42, or the like, to side flanges 43 of the main legs 26. The tabs 41 extend through slots 44 in the main legs 26 and are bent over and secured in position by rivets 45, or the like. A strong, sturdy construction is thus provided for the steps 32. At the bottom, each leg 26 is provided with a rubber foot element 46.

The platform 34 includes a base section 48 having end flanges 49 and a rear flange 50. A secondary section 51 is pivotally connected to the base section 48 through ear elements 52 integral with side plates 53, or otherwise secured to the base section 48 and rod segments 54, welded or otherwise secured to the secondary section 51 (FIGS. 5-7). The secondary section 51 has end flanges 55 and side flanges 56 which prevent paint cans, tools, and the like, from sliding off the top of the ladder 24. When it is desired to stand on top of the ladder 24, the secondary section 51 is moved to the position of FIGURE 7. This position also provides a greater working space for paint, and the like, if necessary. The upper ends of the main legs 26 are secured by nut and bolt assemblies 58 to the end flanges 49 of the base section 48 of the platform 34, and to the side plates 53.

An auxiliary front leg unit 28 is secured to the outer face of each main leg 26 near the bottom thereof (FIGS 1-3 and 14). Each unit 28 includes a mounting bracket 60 secured by suitable screws or bolts to the main leg 26 and having spaced aligned apertures 59. An auxiliary leg 61 having a plurality of spaced apertures 62 therethrough is slidable in the bracket 60 and is maintained in selected position by a latching element 63 incorporating a headed pin 64 and a U-shaped spring loop 65 pivotally mounted in the head of the pin 64 at one end and looped over the free end of the pin 64 at the other end, as is clear from FIGURES 16 and 17. A rubber foot 66 covers the lower end of the leg 61. It is clear that the leg 61 may be adjusted downwardly from the position of FIGURE 1 of the drawings to that of FIGURE 20, for example.

The rear legs unit 30 includes a main sleeve 70 and two secondary sleeves 71 which are secured together by welding, or the like, in the relationship as is clearly shown in FIGURES 1, 3 and 15. The main sleeve 70 is elongated upwardly from the secondary sleeves 71 and receives a leg member 72 therein, each having apertures therethrough for receiving a latching element 63 to maintain them in selected positions. Independently slidably mounted in each secondary sleeve 71 is a leg member 74, both of which have apertures therethrough for receiving a latching element 63. The apertures in the secondary sleeve 71 are close together to permit closer adjustment to ground requirements in leveling. To the lower end of each leg 74 is secured a horizontal member 76, a foot element 77 of rubber, or the like, being secured to the outer end of each in depending relation. It is manifest that the relationship of the lower ends of the main legs 26 and the feet 77 provide a firm base for the ladder 24.

The upper end of the leg 72 is welded to a sleeve 80 which is similarly notched at each end to provide shoulders 81. The sleeve 80 is rotatably mounted on a second sleeve or rod 82 which is mounted at its ends in and fixed to cups 83 welded or otherwise secured to the inner surfaces of the side plates 53. Each cup 83 is also notched to provide shoulders 84 which are alternately engageable by the shoulders 81 of the sleeve 80. This alternate engagement provides the two positions of movement of the ladder 24, namely, the closed position of FIGURE 2 and the fully open position of FIGURE 4. A pin 86 and suitable alignable apertures 88 and 89 in the sleeve 80 and the sleeve 82 are provided for selectively locking the ladder 24 at a fully open or fully closed position (FIG. 13). A safety chain 87 is provided for the pin 86. Reinforcing brackets 90 may be provided between the upper end of the leg 72 and the sleeve 80.

In FIGURES 21-28 is shown a modified step ladder 24' having a rear legs unit, a platform and a mounting construction, which are the same as unit 30, platform 34, and mounting construction 36 shown in the drawings and described above. Hence, these parts have been omitted for conservation of drawings and specification. Main front legs 26', auxiliary front leg units 28' and steps 32' of modified construction are described below.

The main front legs 26' are in parallel relation and of channel cross section, supporting the steps 32', which are of the same length. Each step 32' is of the form shown in FIGURES 23 and 27, including side flanges 40' and end flanges 92. Each step 32' is secured to the legs 26' by rivets 45', as shown, or by bolts, welding at the corners, and the like. A step 32' is provided at the lower ends of the legs 26' to render use of the auxiliary front leg units 28' more convenient.

An auxiliary front leg unit 28' is secured to the outer face of each main leg 26' near the bottom. Each unit 28' includes a sleeve bracket 93 having mounting flanges 94 in a common plane, the sleeve portion 95 being of square cross-section and having aligned spaced apertures 59'. An auxiliary leg 96 of square cross section having aligned spaced apertures 62' is vertically slidable in the sleeve portion 95 and is maintained in selected position by a latching element described above. Welded or otherwise secured to the bottom of the leg 96 in a relation thereto for parallel position to the step 32' is a strong extension member 97, as of angle cross section, to the free end of which is connected a rubber foot 98 by a suitable screw, cement, or otherwise. The legs 96 may be disposed in the positions of FIGURES 21 and 25 for normal use and in the positions of FIGURE 28 for carrying or storage. The extension members 97 lend greater stability to the ladder 24', the feet 98 supporting the ladder 24' at all normal times.

The multi-adjustability of the ladders 24 and 24' is clear from the foregoing descriptions thereof and the drawings. The ladders 24 and 24' can be substantially leveled for use on any terrain, arrangement of steps, and the like. The ladders 24 and 24' are extremely sturdy in respect to step construction, juncture of the main legs 26 and the rear legs unit 34, the front auxiliary legs, and in other areas. Thus, a highly practical ladder formed to stand the abuse of commercial and construction work has been provided.

It is manifest that the disclosed structures fulfill the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawings have been given by way of illustration and example. It is also to be understood that changes in form of the elements, rearrangement of parts, and substitution of equivalent elements, which will be obvious to those skilled in the art, are contemplated as within the scope of the present invention which is limited only by the claims which follow.

What is claimed is:

1. In combination, a sturdy stepladder, and the like, comprising a front portion, a rear portion, and a juncture portion pivotally connecting said front and rear portions; said front portion including spaced main legs, steps supported by said main legs, and an auxiliary adjustable leg unit mounted on each main leg providing individual height adjustment thereof; said rear portion including spaced feet, and means for independently adjusting the height positions of said feet, and additional means for simultaneously and conjointly adjusting the height positions of said feet.

2. The combination of claim 1 in which said front portion includes spaced main legs of channel cross section, and steps supported by said main legs, each step having side flanges and a tab at each end, spaced slots in the main legs receiving said tabs, means securing said tabs to said main legs, and means securing the side flanges of the steps to the sides of the main legs.

3. The combination of claim 1 in which each auxiliary leg unit includes an elongated mounting sleeve having its opening of square cross section and an auxiliary leg of square cross section adapted to slide non-rotatably in the square opening of the sleeve, and means for securing the auxiliary leg in any of a plurality of positions axially of said sleeve.

4. The combination of claim 1 wherein the rear portion comprises a medial vertical member, a first sleeve adjust-

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able vertically along the medial member with means to secure it in any of a plurality of selectable vertical positions, a pair of additional sleeves on opposite sides of the first sleeve, the feet on the rear portion being mounted in the additional sleeves for vertical adjustment therein and means to secure each of said feet individually in pre-selected position in its sleeve.

5. The combination of claim 3 and including an extension member secured to the lower end of each auxiliary leg for increasing the stability of the ladder, the extension members being movable to positions between the spaced main legs.

6. In combination, a sturdy stepladder, and the like, comprising a front portion, a rear portion, and a juncture portion pivotally connecting said front and rear portions, said juncture portion pivotally connecting said front and rear portions including a platform, said front portion being fixed to said platform, and means pivotally connecting said rear portion to said platform and including a sleeve, said rear portion being fixed to said sleeve, and means mounting said sleeve on said platform for limited rotation including opposed mounting cups and interengaging portions on said mounting cups and said sleeves.

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7. The combination of claim 6 in which said platform includes a base portion connecting said front and rear portions, and a secondary portion pivotally connected to said base portion adapted to overlie the base portion in one extreme position of movement and to extend the supporting area of the base portion in the other extreme position of movement.

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