Nov. 12, 1957 H. B. HYAMS ET AL 2,812,599

SELF-LEVELING SUPPORT STRUCTURE FOR IRONING TABLES

Filed Sept. 17, 1954

FIG. 1

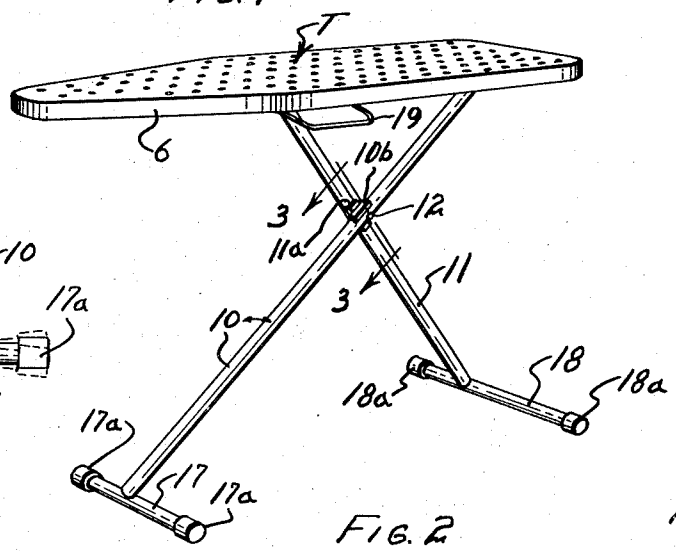


FIG. 5

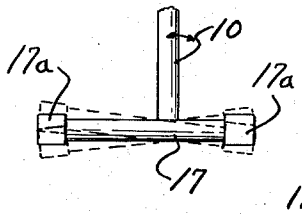


FIG. 2

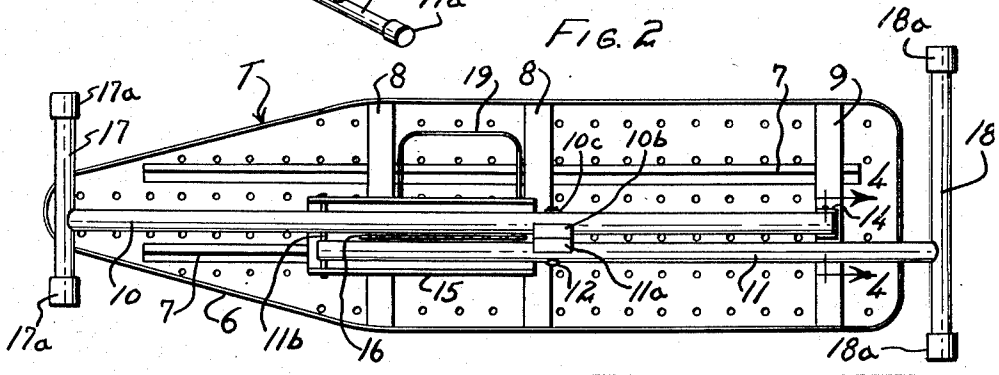
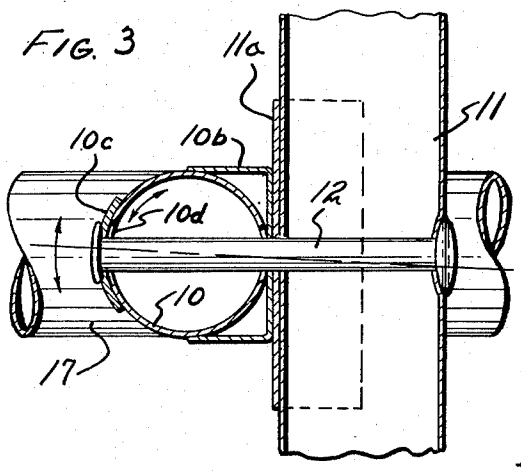


FIG. 3



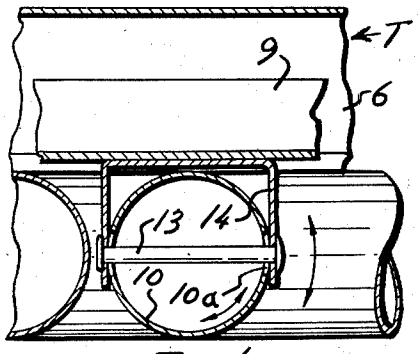


FIG. 4

INVENTOR
HERBERT B. HYAMS
HOWARD E. KERR

BY Williamson, Williamson, Schroeder & Adams
ATTORNEYS

United States Patent Office 2,812,599
Patented Nov. 12, 1957

2,812,599

SELF-LEVELING SUPPORT STRUCTURE FOR IRONING TABLES

Herbert B. Hyams and Howard E. Kerr, St. Paul, Minn., assignors to Atlas Manufacturing Company, St. Paul, Minn., a corporation of Minnesota

Application September 17, 1954, Serial No. 456,759

6 Claims. (Cl. 38—121)

This invention relates to ironing tables and the like where the horizontal top of the table is supported by collapsible leg structure adapted for storage or shipment to be compactly retracted against the table top.

It is an object of our invention to provide a very simple, inexpensive but highly efficient support structure for such a table having base elements for engagement with the floor which define a relatively large area in the form of a four sided figure and providing widely spaced, four-point support for the table, but nevertheless being self-adjustable for unevenness in the floor upon which the table is supported to eliminate the wobble or shakiness usually resulting from table-leg structures which provide a four-point support.

A further object is the provision of collapsible, intermediately pivoted, crossed leg, supporting structure which is readily adjustable for supporting the table top at a multiplicity of different heights; which provides for leg clearance of the user of the table while seated; and which further provides a very stable, rigid and highly efficient four-point support for the table, with provision of self-adjustment of the floor-engaging elements for unevenness or irregularity of the floor on which the table is supported.

A further and more specific object is the provision of supporting structure for an ironing table or the like wherein a minimum number of parts are employed to provide stable and rigid support employing only two intermediately pivoted and crossed leg members with transverse base bars fixed to the lower ends thereof for providing widely spaced, four-point support and in addition, having associated with at least one of said leg members, a simple mechanism to render the floor-engaging elements arranged in the corners of a four sided figure, self-adjusting to conform to unevenness in the supporting floor, thereby eliminating wobble and shakiness of the supporting structure and table.

These and other objects and advantages of our invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a perspective view of an embodiment of our invention set up in a desired elevation of the top, for use;

Fig. 2 is a bottom plan view of the same with the supporting structure collapsed and retracted flush against the bottom of the table top;

Fig. 3 is a cross section taken on the line 3—3 of Fig. 1, showing our novel and simplified mechanism for providing for longitudinal oscillation of one of the legs to render the transverse floor-enaging member at the lower end thereof, self-adjustable for irregularities or unevenness in the floor or other supporting surface for the table;

Fig. 4 is a cross section taken on the line 4—4 of our Fig. 2 showing our simple mechanism for providing at the hinged upper end of the forward leg, freedom for longitudinal oscillation of the entire leg to furnish a self-adjusting, four-point support for the table; and

Fig. 5 is a detail or fragmentary perspective view of the lower end of the forward leg showing the self-adjusting features of the transverse base member thereof.

In the drawings, an embodiment of our invention in the form of an ironing table, is illustrated having an elongated top T of conventional structure made from sheet metal material provided with a multiplicity of perforations or apertures and tapered at its forward end and reinforced at its longitudinal edges by a depending, narrow metal band or flange **6**. The top T is further reinforced at its underside by a pair of spaced, longitudinal ribs **7** equally spaced from the longitudinal center line of the top and welded or otherwise rigidly affixed to the top together with a series of widely spaced, transverse channel bars **8** and **9**, two of said bars **8** being positioned at the intermediate portion of top T and a rear channel bar **9** being spaced forwardly a short distance from the rear edge of the top.

Collapsible, supporting leg structure is attached to the bottom of the board, preferably to the transverse channel bars **8** and **9**, which consists in its simplest form in a pair of leg elements **10** and **11** intermediately pivoted by a heavy pin **12** in crossed relationship, said leg elements in the simplest form, comprising a pair of metal pipes or tubes **10** and **11** although of course, each leg element may comprise two or more members if desired. One of said leg elements (as shown, the front leg **10**) at its upper end is hinged to the underside of the top on a fixed hinge axis provided as shown in Fig. 4 by the hinge pin or pintle **13**. Hinge pin **13** extends transversely of top T and is carried by the lower ends of a depending U-bracket **14** which is welded or otherwise affixed as shown to an intermediate portion of the transverse bracing channel **9**. This hinge pin passes through diametrically opposed apertures provided in the upper end of leg **10**. With such hinge structure, the forward leg **10** may freely swing relative to the top T from various diagonally disposed positions as shown in Fig. 1 to a collapsed position flush against the bottom of the top as shown in Fig. 2.

In addition to said hinged relation of the forward leg **10** to the top of the table, we provide for an oscillatory relationship of leg **10** longitudinally of the leg and upon the hinge pin **13**. To this end, the tubular leg **10** is provided at its upper hinged end, as shown in Fig. 4, with at least one circumferential slot **10***a* where the hinge pin **13** passes through transversely of the upper end of leg **10**. Diametrically opposed slots **10***a* may be provided if desired although one slot is all that is necessary if a tubular leg of relatively thin gauge is employed since there is sufficient play in the aperture drilled on one side of the upper end of the leg for receiving the hinge pin to enable oscillation longitudinally of the leg to occur when necessary for self-adjustment of the base or foot portion of the leg.

As shown in Fig. 3, the heavy pivot pin **12** at the intermediate and crossed pivotal connection of legs **10** and **11** extends transversely through both of the legs and has headed extremities which prevent its displacement. A short channel shaped bearing plate **11***a* is welded or otherwise affixed to the inner side of leg **11** at the pivotal joint having its intermediate web in bearing contact with a short channel shaped bearing member **10***b* welded or otherwise affixed to the inner side of the tubular leg **10** as shown in Fig. 3. An outer bearing cap **10***c* in the form of an arcuate plate may embrace a fragment of the outer longitudinal surface of leg **10** beneath an adjacent head of the heavy pivot pin **14**. The pivot pin of course passes through diametrically opposed apertures formed in the appropriate portions of the crossed tubular legs **11** and **10**. However, in the case of forward leg **10**, one or more of these pin-receiving apertures is constructed in the

form of a circumferential slot **10***d* (see Fig. 3) to provide, in conjunction with the slot **10***a* in the upper end of leg **10**, for longitudinal oscillation of the entire tubular leg relative to its pivoted portions and connections. While as shown, only one slot is provided in each of said pivotal connections whereby the slight oscillation provided of the leg **10**, is substantially on an axis adjacent the aperture on the opposite side of the leg, it will be definitely understood that opposed, similar slots may be provided to facilitate even greater oscillation wherein the oscillation will occur along substantially the axis of the tubular leg **10** itself rather than along a longitudinal line at one side of the leg.

The other support leg (in the form shown, the rear leg **11**) may comprise a rigid metal tube or pipe having its upper end provided with a fixed hinge pin **11***b* which as shown is guided for slidable adjustment longitudinally of the bottom of the top T by a guide plate **15** having downturned, longitudinal flanges wherein the ends of the hinge pin **11***b* are received. The guide plate **15** as shown, is welded or otherwise rigidly secured to the bottom of the transverse channel braces **8**. The guide plate is provided with a retractible, elongated, rack plate **16** which carries forwardly extended or curved teeth adapted to selectively engage the intermediate exposed portion of the hinge pin **11***b*. The rack plate **16** is urged downwardly by spring or gravity and may be retracted readily by a U-shaped or bale handle **19** which as shown, is made of a rod and the loop of the U extends laterally outward to a point adjacent one of the longitudinal edges of the top T, normally being inclined downwardly to facilitate ready engagement by the hand of the user for lifting to disengage the teeth of plate **16** from the hinge pin **11***b*, thus enabling the table to be adjusted for height or to enable the legs **10** and **11** to be retracted or collapsed inwardly flush aginst the top for storage or shipment in the position shown in Fig. 2.

Each of the legs **10** and **11** has rigidly affixed to the outer end, a transverse base bar or foot **17** and **18** respectively, the forward bar **17** as shown, being of a length slightly less than the maximum width of the top T while the foot **18** as shown secured to the rear leg **11**, is of a length slightly wider than the over-all width of top T. It will of course be understood that these proportions may be changed but in general, it is desirable to provide the rear leg with a wider base and narrowing the base of the forward leg for collapse against the board, facilitates the guiding of the collapsed table into a shallow envelope or container. Each of the base bars or feet **17** and **18** at its extremities, is provided with floor-engaging collars **17***a* and **18***a* respectively, which are preferably constructed of heavy rubber or other slightly compressible and frictional material. The actual engagement of the supporting structure of the table therefore with the floor, is made through contact of the collars **17***a* and **18***a* with the floor, the points of contact it will be noted, being arranged in very widely spaced relation and defining the corners of a four sided figure of considerable area.

From the foregoing description, it will be clearly understood that the entire rigid, tubular leg **10** is mounted for freedom to longitudinally oscillate to a limited degree upon its pivotal connection with pin **13** at its upper end and upon its pivotal connection with the heavy pivot pin **12** connecting the two legs together at their point of crossing. With such provision when the table is set up as shown in Fig. 1, in any desired elevated position of the top within the range provided for, the two collars **17***a* at the outer ends of the rigid base bar **17** will engage the floor-supporting surface at spaced points and if there is any unevenness or irregularity in the floor, the entire leg **10** will automatically oscillate to the extent needed for compensation and make contact of the collars **17***a* with the floor. Thus, with our structure, a very firm four-point support of wide configuration or area is always assured preventing wobbling or shaking of the structure as is often present with tables having fixed four-point support.

The self-adjustment of the contact collars **17***a* of one of the legs is well illustrated in Fig. 5, the dotted lines indicating the variance possible in positioning of the contact collars **17***a* through longitudinal oscillation of the tubular leg **10** within the range provided by the circumferential slots **10***a* and **10***d* in the upper hinged end and intermediately pivoted portions of that leg.

The self-adjustment of the floor contact collars **17***a* to conform to unevenness of a supporting floor is brought about through the combination of a diagonally disposed (as contrasted from a vertical) supporting leg with the oscillatory mounting of that diagonal leg and the transverse affixation of the base bar **17**. It will, of course, be understood that the structure of leg **10** and its oscillatory connections with the hinge beneath the table top as well as at the intermediate pivotal crossing of the legs may be applied to the rear leg of the ironing table shown or to various supporting leg structures to obtain a four-point support where the oscillatory leg is disposed diagonally of the floor or other supporting surface.

The crossed supporting legs **10** and **11** are preferably positioned at one side of the longitudinal center line of the board (although this feature is not novel), to make provision for knee and leg room on the part of the user if the user is seated in a chair facing the board.

The slide adjustment and interconnection at a multiplicity of various points longitudinally of the underside of the top on the part of the rear leg **11** makes provision for variations in the elevation of the supported top above the floor for users in seated or standing positions and for various heights. This feature is also old in the art.

The self-adjustment or compensating features of the supporting leg structure, through the inherent combination of elements described and illustrated in our drawings, produces a natural rolling action of the transverse base support **17** with attendant oscillation of leg **10** as the table is set up upon a somewhat uneven or irregular floor surface. The floor elements **17** and the ends of the leg roll like a roller truck to properly position the element **17***a* firmly against the floor, thereby cooperating with the elements **18***a* on leg **11** to furnish stable four-point support.

In the appended claims and specification, where the terms "slotted" or "transversely slotted" or "slot and pin structure" are used, the word "slot" is employed in its broad general meaning to include an enlargement or aperture of dimensions permissible of twisting or oscillation of the attached leg along a longitudinal axis.

From the foregoing description, it will be seen that we have provided simple, inexpensive and highly efficient support structure and four-point leg support for tables and other furniture wherein compensation or self-adjustability is made for unevenness in the supporting floor providing always four-point support and eliminating the wobble or shakiness usually resulting from a table leg structure giving four-point support.

It will, of course, be understood that various changes may be made in the form, detail, arrangement and proportion of the parts without departing from the scope of our invention.

What we claim is:

1. Self-adjustable supporting structure for a table having ends comprising leg structure connected to the table top and underlying in general one end of the table and having two widely spaced floor-engagement elements disposed transversely of the table and a second leg structure comprising an elongated leg element having a longitudinally oscillatable connection at its upper end to the table top at a point widely spaced from the connection of said first leg structure with the table top and extending diagonally downward and outwardly with its outer end disposed in widely spaced relation to the floor-engagement elements of said first leg structure, the connection

between said leg element and the table comprising slot and pin elements related to provide for limited longitudinal oscillation of said leg element to said top, and a base bar affixed to the lower end of said leg element substantially perpendicular thereof and transversely of the table and having at its two extremities depending floor-engaging elements for furnishing two widely spaced points of support for the table whereby with said diagonally disposed leg element compensation is made for stable, four-point support of the table from a floor through attendant oscillation of said leg element and the swingable shifting of said floor-engaging elements as required by an uneven floor surface.

2. The structure set forth in claim 1 wherein said first mentioned leg structure is disposed in cross-bracing relation with said leg element and interconnected therewith at the point of crossing and wherein the connection includes slot and pin structure transversely of said leg and also permitting limited longitudinal oscillation of said leg relative to the table and to the interconnected first leg structure.

3. A table having a table top and a supporting structure therefor, said supporting structure comprising a pair of crossed table-supporting leg elements connected at their upper ends at longitudinally spaced points to the bottom of the table top, said leg elements each having at its lower end a pair of widely spaced floor-engaging elements disposed transversely thereof, means connecting the leg elements at their juncture of crossing whereby one leg element will be oscillatable substantially on its longitudinal axis relative to the other leg element, the connection of said one leg element to the table top including means whereby said one leg element will be oscillatable relative to the table top and on a longitudinal axis in substantial alignment with the other oscillation axis, whereby to provide stable four-point support which compensates for unevenness in the floor surface.

4. A table having a table top and a collapsible supporting structure therefor, said supporting structure comprising a pair of crossed table-supporting leg elements swingably connected at their upper ends at longitudinally spaced points to the bottom of the table, said leg elements each having at its lower end and rigid therewith a pair of widely spaced floor-engaging elements disposed transversely thereof, the connection of one of the legs to the table top including means permitting the leg to swing and to move longitudinally outwardly of the under side of

the table to allow the legs to be collapsed into a position of substantial parallelism with the under side of the table top, means connecting the leg elements at their juncture of crossing whereby the leg elements are swingable on a transverse axis relative to each other and whereby one leg element will be oscillatable on a longitudinal axis relative to the other leg element, the connection of said one oscillatable leg element to the table top including means whereby said one leg element will be oscillatable relative to the table top and on a longitudinal axis in substantial alignment with the other oscillation axis, whereby the legs provide stable four-point support which compensates for unevenness in the floor surface.

5. The invention set forth in claim 4 wherein the connection of the juncture of the crossed leg elements and the connection at the upper end of said one oscillatable leg element to the table top being in the form of pins and slots.

6. A table having a table top and a supporting structure therefor, said supporting structure comprising a pair of crossed table-supporting leg elements connected at their upper ends at longitudinally spaced points to the bottom of the table top, a pair of cross bars each rigidly connected to the lower end of a respective leg element and extending transversely thereof, each of said cross bars having floor engaging elements at the opposite ends thereof, the point of connection between one cross bar and the corresponding leg element being spaced from the longitudinal center point of the bar, means connecting the leg elements at their juncture of crossing whereby one leg element will be oscillatable substantially on its longitudinal axis relative to the other leg element, the connection of said one leg element to the table top including means whereby said one leg element will be oscillatable relative to the table top and on a longitudinal axis in substantial alignment with the other oscillation axis, whereby to provide stable four-point support which compensates for unevenness in the floor surface.

References Cited in the file of this patent

UNITED STATES PATENTS

1,801,151	Gomber	Apr. 14, 1931
1,821,259	Davis et al.	Sept. 1, 1931
2,546,097	Hild	Mar. 20, 1951
2,661,554	Siczkiewicz et al.	Dec. 8, 1953
2,663,101	Olander	Dec. 22, 1953