EXTENSIBLE LEAF SUPPORT AND LOCK MEANS FOR AN EXTENDABLE TABLE

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This invention relates to an extendable table construction and, more particularly, to a table construction provided with extension leaves accommodated in retracted position beneath a table top and movable into extended position with their top surfaces flush with the table top surface.

Prior proposed extension tables have included table top members supported by a table frame and extension panels which were movable into the planar zone of the table top member by various means. Such prior means for moving a panel into the planar zone of the table top member usually required movement of the end panel outwardly from beneath the table top member in a horizontal plane, vertically lifting the end panel upwardly into the plane of the top, and then locking the end panel in said plane. Such prior proposed panel-moving means were usually made of metal and were not suitable for table constructions made entirely of wood. Such prior means often did not provide adequate support for an end panel in extended position and imposed limitations in construction on the width or length of the panel.

This invention contemplates an extendable table construction which is particularly adapted for, although not limited to, an all wood table construction. The invention contemplates a table construction in which the extension leaves may be, for example, the same width as a table top and only slightly less than half the length of the table top so as to substantially double the length of a table. The invention contemplates such an extendable table wherein extension leaves are moved in and out of extended position by a simple straight line motion as compared to complex paths for movement provided in prior proposed devices.

It is, therefore, the primary object of this invention to disclose and provide an extendable table construction wherein the length of a table may be virtually doubled and wherein extension leaves are moved to and from retracted and extended positions in novel manner.

An object of this invention is to disclose and provide an extendable table construction wherein extension leaves are movable along an inclined plane to and from retracted and extended position.

Another object of this invention is to disclose and provide an extendable table construction wherein an extension leaf is supported in novel manner.

A further object of this invention is to disclose and provide an extendable table construction including an extension leaf which is tilted about a fulcrum located centrally thereof to position the leaf in the plane of the table top.

A still further object of this invention is to disclose and provide an extendable table construction wherein an extension leaf is slidably supported to permit a straight line motion to extend or retract said leaf and which is also urged by a straight line motion in the plane of the table top into locked position therewith.

Still another object of this invention is to disclose and provide an extendable table construction wherein an extension leaf is supported in extended position by a main extension arm in a stable, steady manner even though the extension leaf may be slightly less than half the length of the table.

The invention contemplates a table construction as mentioned above wherein novel means are provided for securing an extension leaf in extended position so that said leaf is positively restrained from upward, downward, and lateral movement with respect to the table top.

Generally speaking, this invention contemplates an extendable table construction provided with extension leaves for each end of the table. Each extension leaf is accommodated in retracted position beneath a table top having an inclined bottom surface. A table frame is provided with guide means which are parallel to said surface and which cooperate with leaf-supporting means for each extension leaf, said leaf-supporting means including a main extension arm slidably on said guide means for approximately half its length and a leaf-slide bar fixedly carried by each extension leaf and slidable relative to the main extension arm for approximately half the length of the extension leaf. When extended, the extension leaf is supported adjacent its central portion by the main extension arm and may be tilted thereabout so that the leaf may be horizontally pushed inwardly against the table top and into locked position therewith. A wedge means carried by the table frame is positionable between the main extension arm and the inner end of the leaf-slide bar to lock the leaf, said wedge means being readily releasable to permit retraction of the leaf to a position beneath the table top.

Other objects and advantages of this invention will be readily apparent from the following description and drawings.

In the drawings:

Fig. 1 is a perspective view of an extendable table construction embodying this invention, one end leaf being shown in extended position and the opposite end leaf being shown in retracted position.

Fig. 2 is an enlarged, fragmentary, sectional view taken in the plane indicated by line II—II of Fig. 1 and showing an extension leaf retracted.

Fig. 3 is a sectional view taken in the same plane as Fig. 2 showing the extension leaf partially withdrawn.

Fig. 4 is a fragmentary, sectional view taken in the same plane as Fig. 2 showing the extension leaf in position of maximum withdrawal.

Fig. 5 is a sectional view taken in the same plane as Fig. 2 showing the extension leaf moved in final extended position.

Fig. 6 is a fragmentary, enlarged view showing interengagement of the leaf-slide bar with the main extension arm in the relationship shown in Figs. 3 and 5.

Fig. 7 is a transverse, vertical, sectional view taken in the plane indicated by line VII—VII of Fig. 5.

Fig. 8 is a horizontal, transverse, sectional view taken in the plane indicated by line VIII—VIII of Fig. 7.

Fig. 9 is a fragmentary end view partly in section of a modification of the leaf-locking means, the table top and end leaf being omitted from the drawing.

Fig. 10 is a fragmentary, perspective view showing the locking device in detail used in this modification.

Fig. 11 is a fragmentary view taken in a plane indicated by line XI—XI of Fig. 9 but showing the table top and slide bar in locked position.

In Fig. 1 an extendable table construction embodying this invention is generally indicated at 20. The table construction 20 includes a table frame comprising parallel, spaced apart, side frame members 21, end frame members 22, and legs 23. The legs and frame members 21 and 22 may be joined together in well known manner. A table
The table frame including the frame members 21, 22 and legs 23 may be constructed of suitable wood material and the frame may be of selected width, length, and height. Interbracing between side and end frame members 21 and 22 and the legs 23 to provide a rigid table frame is not illustrated because any well-known bracing may be used.

The table top 24 provides a flat, planar, rectangular top surface 28 of uniform width and length sufficient to extend laterally and longitudinally beyond the table frame. The table top 24 is provided with a central, transverse, thickened support section 29 seated on and secured to side frame members 21 adjacent the mid section thereof. Outwardly from support section 29, bottom surfaces 30 of the table top 24 incline upwardly to opposite end portions of the table top. The bottom surfaces 30 are defined by shoulders at the center support section and by transverse edges 31 of the table top. At end edge 31 a relatively thin section of table top material is provided and longitudinal margins of the table top are spaced from the top edges of the side frame members and legs 33.

The extension leaf 26 at each end of the table is preferably of longitudinal tapered section with a thick outer end edge and a thin inner end edge so as to be readily accommodated beneath table top 24 in the space between the side frame members 21 and the top. If desired, each extension leaf 26 may be cut from the table top material by cutting along a transverse inclined plane so as to provide an inclined bottom surface 30 while at the same time providing an extension leaf. The extension leaf 26 may be of the same width as table top 24 and is of a length only slightly less than one half the length of the table top 24. Each leaf 26 may be preferably of a length sufficient to comfortably accommodate a table setting at opposite sides thereof. It may be noted that when the table leaf 26 is in retracted position, the table 20 presents the appearance of having a table top of uniform thickness throughout its length.

An important part of this invention is the manner in which each extension leaf 26 is supported for movement from retracted position to extended position. The support means for each leaf 26 may include guide means comprising guide rails 33 of wood secured to inner faces of side frame members 21 and inclined so as to be virtually parallel with adjacent bottom surface 38 on the top table. Each guide rail 33 includes a rabbed longitudinal top edge 34 which is positioned with respect to the associated side frame member 21 so as to slidably receive and laterally retain a complementary inwardly-facing rabbed bottom longitudinal edge 35 of the leaf 26. Each main extension arm 36 may include an elongated strip of wood of suitable thickness to provide necessary strength and support for an end leaf 26 in extended position. Each main extension arm 36 includes a top inwardly-facing rabbed edge 37 presenting top guide face thereof along slidable cooperation with a complementary downwardly-facing and outwardly-facing rabbed longitudinal bottom edge 28 on a leaf-slide bar 39. The main extension arm 36 extends through a suitable slot 40 provided in end frame member 22 adjacent each leg 23, said slot 40 being open at its top to receive also the leaf-slide bar 39. If desired, outer ends of main extension arms 36 at each end of the table may be chamfered or beveled alternately by a cross member 41. Similarly, the inner ends of each pair of main extension arms may be transversely interconnected by an inner cross member 42 so that the pair of arms 36 at each end of the table may operate simultaneously.

Each extension arm 36 includes an outer upstanding end portion 44 and an inner upstanding end portion 45 to support and engage respectively the leaf 26 and the top 24. Outer end portion 44 is non-rabbeted and provides a stop to limit relative outward movement of leaf 26 with respect to the main arm 36, the outer end face of slide bar 39 abutting at as 46 upstanding portion 44. Interengaging means to releasably connect slide bar 39 with the main extension arm 36 may include an elongated bore 47 in end portion 44 to releasably slidable accommodate therewithin a forwardly extending pin 48 projecting from the opposed outer end of slide bar 39. The bottom face of each end leaf 26 may be provided with a pair of longitudinally extending tapered grooves 59 which slidably accommodate and guide the outer end portions 44 of the main extension arm 36 when leaf 26 is moved relative to the extension arm 36.

The extension leaf 26 of the arm 36 slidably contacts as at 49 the bottom surface 30 of the table top. The central support section 29 may be provided with a downwardly facing groove 50 therein for accommodating end portion 45 when leaf 26 is in retracted position. Intermediate its ends, the main extension arm 36 may be provided with a relatively short, longitudinally extending recess 52 in its uppermost edge portion for cooperatively receiving a leaf-locking wedge element 60.

Outward movement of extension arm 36 may be limited by contact of an inwardly projecting dowel rod 67 carried by arm 36 with the end frame member 22. Rod 67 is positioned inwardly of recess 52 a selected distance so that wedge element 60 is restrained in non-locking position as described hereinafter.

Each leaf-slide bar 39 is fixedly secured to the bottom surface of end leaf 26 adjacent a side thereof and is provided with a downwardly facing, rabbed, longitudinal edge 38 which lies parallel to the inclined bottom surface 30 on table top 24 when the leaf is in retracted position and in cooperative slidable engagement with extension arm 36. Slide bar 39 is provided with an inner end portion 55 which is pivotally received in the inverted recess 52 of the inner end portion 55 of end leaf 26. Inner end portion 55, when the leaf is retracted, is accommodated beneath and cooperates with the adjacent center support section 29 as at 57, Fig. 2. In extended position, the inner end portion 55 of each slide bar cooperates as at 58 with the bottom outer marginal face of the table top 24 to limit tilting of leaf 26.

The top face of portion 55 may be inclined to be complementary to bottom surface 30 of top 24. Means for locking extension leaf 26 in extended position to prevent tilting thereof and to provide a steady and sturdy surface may comprise in this example, wedge element 60 having a top wedge face and pivotally mounted on pin 61 in a recess 62 provided in an inner top portion of a table leg 23 adjacent to and above guide rail 33. The wedge element 60 may be of any suitable shape and is illustrated here as being of generally triangular shape with pivot pin 61 at one of the apexes of the triangle. Each main extension arm 36 has a wedge element 69 provided with a connection at 63 to one end of a biasing spring 64, said biasing spring being turned about the pivot pin 61 and having its other end seated as at 65 against an internal face of recess 62. The spring 64 normally biases the wedge element 60 outwardly. In retracted position of end leaf 26, extension arm 36 may be locked longitudinally extended by bearing against face 66 of the element. In extended position of the leaf 26, recess 62 in arm 36 is opposite element 60 and permits the element to move inwardly.
above arm 36 for ultimate positioning between slide-bar portion 55 and arm 36. This action is described herein-after in more detail.

Operation of the extendable table construction described above is in general accomplished by withdrawing end leaf 26 in a straight line motion slightly upwardly inclined until the end leaf is positioned beyond the transverse end edge of table top 24. The end leaf is then tilted slightly about arm portion 44 of extension bar 36 and then pushed inwardly in a straight line motion in a horizontal plane to position inner slide-bar portions 55 between transverse edge margins of the top table and wedge element 60.

To facilitate outward movement of the end leaf 26, a finger-hold recess 69 may be provided in the outer under surface of the leaf. As the leaf is pulled outwardly, slide bar 39 moves therewith since it is fixed thereto and relative to main arm 36. Slide bar 39 is guided by the cooperable rabbeted edges on the arm 36. When leaf 26 has been withdrawn slightly less than half its length, pin 48 moves into recess 47 in extension arm 36 and the outer end of slide bar 39 contacts the inner face of upward extension portion 45 (Fig. 3). The interlocked slide bar, end leaf and main extension arm are then drawn outwardly until dowel pin 67 on the main extension arm contacts the inner face of end frame member 22 (Fig. 4). At this position, inner edge 56 of the end leaf 26 may be spaced about one inch from edge 31 of the table top 24. As the leaf is pushed inwardly, the inner slide bar portions 55 are positioned beneath the transverse end edge of the recess 47. To retract end leaf 26 from extended position, it may be first grasped and then drawn outwardly to disengage wedge element 60 from the inner slide-bar portion 55. The end leaf 26 is then tilted so that the slide bar engages the guide faces on the main extension arm 36. The end leaf is then pushed inwardly in the same inclined plane in which it was first withdrawn. Upon moving inwardly, the inner end of the slide bar strikes wedge element face 66 and pushes the bladed wedge element about pin 61 into recess 62. The end leaf is moved inwardly until slide-bar portion 55 strikes the upstanding end portion 45 of the main extension arm which then causes the main extension arm to move inwardly along the guide rail 33 until the leaf is fully retracted beneath the table top.

In Figs. 9 to 11 inclusive is illustrated a modification of a leaf-locking means which may be substituted for wedge element 60 described above. The locking means includes a metal locking member 75 having an elongated base portion 76 of uniform width adapted to be secured in any suitable manner to the inner face of the inner slide-bar portion 55. The base portion 76 extends slightly above a top inclined face 55a a selected distance so that when locking member 75 is engaged with table top 24, leaf 26 will be positioned with its top surface flush with the top surface 25 of the table top. The base portion 76 carries at its top a table top engagement lug or hook portion 77 extending inwardly and in a plane normal to base portion 76. The hook portion 77 has a length greater than the width of base portion 76 and may terminate in a beveled end face 78. At the other end of base portion 76 may be provided a frame engagement bottom lug or portion 79, said bottom portion lying parallel to hook portion 77 and having a tapered end face 80.

The table top 24 may be provided with an elongated longitudinal recess 82 in its bottom surface adjacent to the path of travel of slide bar 39. The inner end of said recess 82 may be partially covered by a metal flat plate 83 secured in any suitable manner to top 24 with its bottom surface in the same plane as inclined bottom surface 30 of the table top. The end frame member 22 may be provided with a through slot 84 opening into slot 40 and with a recess 85 thereabove opening sidewardly and outwardly of frame member 22. It may be noted that the end slot 40 in the frame member 22 may be slightly enlarged as at 85 to permit passage therethrough of the end of slide-bar portion 55 with the locking member 75 thereon sliding thereon.

Operation of this modified form of leaf-locking device includes substantially the same movements as described above in the prior embodiment. End leaf 26, when withdrawn to maximum extended position, is disposed with slide bar end portion 55 outwardly spaced from end frame member 22. In this withdrawal, locking member 75 passes through the enlarged upper end of slot 40 in the end frame and the bottom lug portion 79 passes through slot 84. The top hook portion 77 passes over the top of end frame 22. The end leaf may then be tilted so as to bring its top surface flush with the table top surface and in so doing the hook portion 77 is moved into the elongated recess 82 in the bottom surface of the table top. Upon pushing the end leaf inwardly, hook portion 77 engages with plate 83 and is received between the plate 83 and the opposed wall of recess 82. At the same time the bottom lug 79 and locking member 75 are engaged and leaf 26 is retracted to the closed position. It may be noted that the beveled faces 78 and 80 on the portions 77 and 79 respectively are oppositely inclined so that as the locking member is urged into engagement with the plate 83 and the end frame member 22, the portions 77 and 79 tend to be spread apart. The locking member thus firmly engages the end extension leaf 26 with the table frame and table top. The design of the locking member 75 is such that it also assists in the prevention of lateral and tilting displacement of end leaf 26.

The extendable table construction described above thus
provides a means for supporting an end leaf in a novel, stable and steady manner. It is important to note that
the end leaf is firmly supported at its mid portion in extended position by the main extension arms 36. The main
extension arms 36 are firmly supported by interengagement of substantially half the length of the arms
with guide rails 33 and also with the table top through the unlocking portions 45. Thus, vertical displacement
of the main extension arms is positively limited and any tilting force applied to the extension arms as by a load
applied to the outer end of the extension leaf is transmitted to the table top at an area spaced well inwardly from the
top thereof. Loads applied on the end leaf at its inner end
adjacent to the meeting edges of the table top and said
leaf are firmly resisted by the wedging of the locking means which transmit such forces to the table
frame. The provision of an inclined bottom surface on the table top, together with guide means extending
parallel thereto, simplifies withdrawal and retraction of
an end leaf. This design provides a table top of virtually
uniform depth throughout its length when end leaves are
in retracted position.

It is understood that various modifications may be made
in the design of the extendable table construction dis-
closed herein which may come within the spirit of this
invention and all such modifications and changes coming
within the scope of the appended claims are embraced thereby.

I claim:

1. An extendable table construction, the combina-
tion of: a table frame including interconnected side, end
and leg frame members; a table top supported centrally
from said side members and provided with a bottom up-
wardly and outwardly inclined surface spaced from said
members; an extension leaf of tapered section receiv-
able between said top and said members in retracted posi-
tion; leaf-supporting means operable to support said
leaf in extended position and including a guide rail on
each side member parallel to said inclined surface, an
extension arm slidably on said rail and provided with
upstanging end portions slidably engaging said leaf
and leaf respectively, a slide bar on said leaf slidably
on said arm and limited in movement relative thereto by
selective engagement with said arm end portions, said
slide bar having an inner portion engageable with the
table top in leaf-extended position; and means to lock
the leaf in extended position.

2. A table construction as stated in claim 1 including
stop means on said extension arm engageable with the
end frame member to limit movement of the arm dur-
ing extension of the leaf.

3. A table construction as stated in claim 1 including
interengaging means on said slide bar and on one of
said upstanging end portions.

4. A table construction as claimed in claim 1 wherein
said lock means includes a biased wedge element position-
able between said slide bar and said extension arm.

5. In an extendable table construction, the combina-
tion of: a table frame including side, end and leg frame
members; a table top supported centrally from said frame
members and provided with a bottom upwardly and out-
wardly inclined surface spaced from said members; an
extension leaf of tapered section receiv-
able between said top and said members in retracted posi-
tion; leaf-supporting means operable to support said
leaf in extended position and including guide means on
each side member parallel to said inclined surface and
including guide means on each side member
engaged in said slide bar to lock the leaf in extended
position; and means on said frame members to lock the leaf in extended
position.

6. In an extendable table construction, the combina-
tion of: a table frame including side, end and leg frame
members; a table top supported centrally from said side
members and provided with a bottom surface spaced from
said members; an extension leaf of retracted position
and said top and said members in retracted position; leaf-sup-
porting means operable to support said leaf in extended
position and including guide means on each side member,
a movable main extension arm slidably mounted on
said guide means, said leaf being provided with means
slidably engageable on said arm and having an inner portion en-
gageable with said slide bar; interengagement means on
said arm and on said slide bar means on said leaf to position
the arm in supporting relation to the leaf outwardly
of the table top; and means on said inner portion and
on said frame members to lock the leaf in extended
position.

7. In an extendable table construction, the combina-
tion of: a table frame; a table top supported centrally
from said frame and provided with a bottom upwardly
and outwardly inclined surface spaced from said frame;
an extension leaf of tapered section receiv-
able between said slide bar and said members in retracted position; leaf-supporting means operable to support
said leaf in extended position and including guide means
on said slide bar and slide bar on said arm and having an
inner portion engageable with said slide bar; interengagement means on said slide bar and on said slide bar
means on said leaf to position the leaf in supporting relation to the leaf outwardly of the table top; and means on said inner portion and on said frame members to lock the leaf in extended
position.

8. In an extendable table construction, the combina-
tion of: a table frame; a table top supported centrally
from said frame and provided with a bottom upwardly
and outwardly inclined surface spaced from said frame;
an extension leaf of tapered section receiv-
able between said slide bar and said members in retracted position; leaf-supporting means operable to support
said leaf in extended position and including guide means
on said slide bar and slide bar on said arm and having an
inner portion engageable with said slide bar; interengagement means on said slide bar and on said slide bar
means on said leaf to position the leaf in supporting relation to the leaf outwardly of the table top; and means on said inner portion and on said frame members to lock the leaf in extended
position.
engagement means on said members to position one member in supporting relation to the leaf outwardly of the table top, the other of said members having an inner portion extending inwardly of the leaf; and means to lock the leaf in extended position including a locking member on the inner portion, and means on the table top and frame cooperatorably engageable with the locking member.

11. A table construction as claimed in claim 10 wherein said locking member includes a hook portion extending above said inner portion, said table top being provided with a recess to lockably receive the hook portion when the leaf is urged into final extended position.

12. A locking member for an extendable table construction comprising: an elongated base portion; parallel engagement lug portions at each end of said base portion and lying in planes normal to the plane of the base portion, one of said lug portions projecting beyond an edge of said base portion; said lug portions being provided at corresponding ends with beveled edge faces.

13. A locking means for an extension leaf for an extendable table construction having a table top, table frame members and slidably extendable relatively movable leaf-supporting members, comprising in combination: a locking member carried at the inner end of one of said slidably members, said locking member having a table top engagement portion and frame member engagement portion, said table top being provided with a recess to cooperably receive said top engagement portion, said end frame member having a recess to cooperably receive said frame engagement portion.

14. An extendable table construction including in combination therewith: a table top provided with a central, transverse, thickened support section, said top having upwardly and outwardly inclined bottom surfaces extending in opposite directions from said support section; and extension leaves positionable beneath said inclined bottom surfaces, each extension leaf having a tapered section with relatively thick outer portions and relatively thin inner portions, each leaf having a top surface lying in an inclined plane virtually parallel to said bottom surface when said leaf is in retracted position beneath said table top, each leaf being extendable by sliding movement parallel to the inclined plane defined by the bottom surfaces of the table top, and movable support means engageable by each leaf for movement in a path parallel to said inclined plane for positioning in supporting relation to the leaf outwardly of the table top.

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