Oct. 19, 1965 T. H. WARDLAW ETAL 3,212,815

TABLE AND CHAIR STRUCTURE

Filed July 23, 1962 2 Sheets-Sheet 1

Fig. 1.

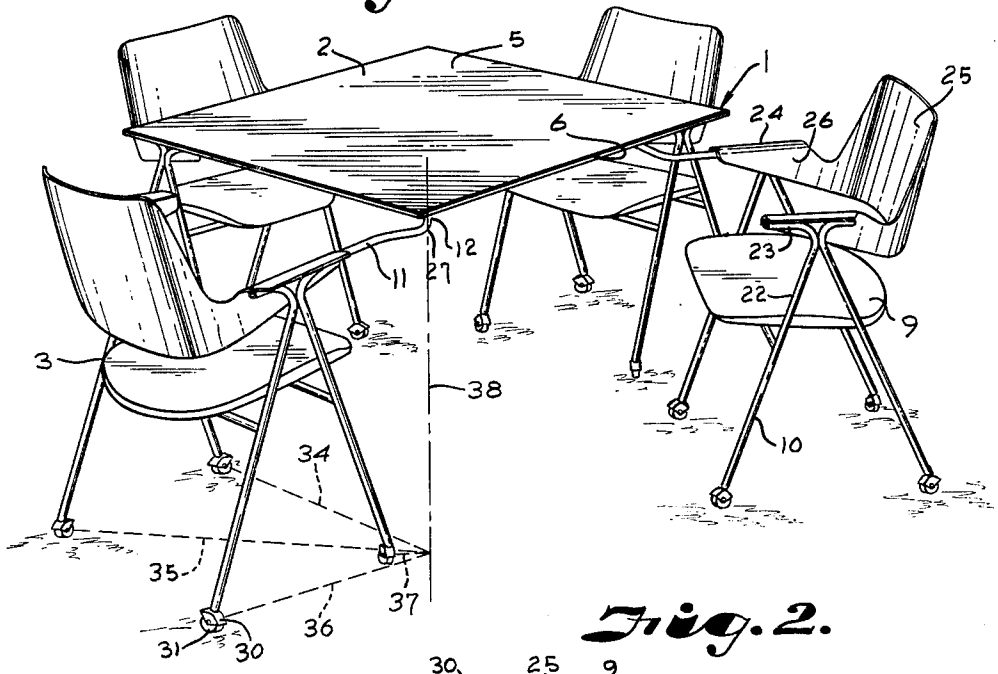


Fig. 2.

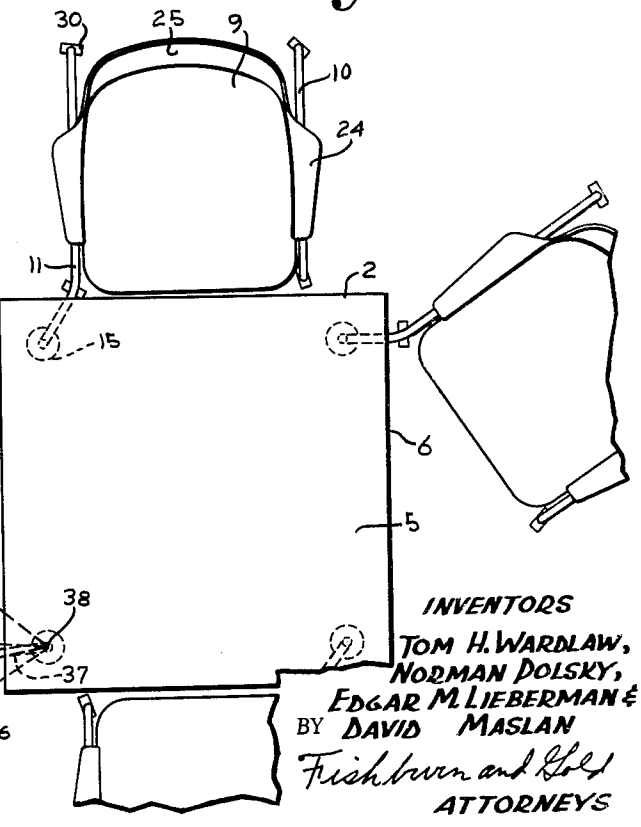
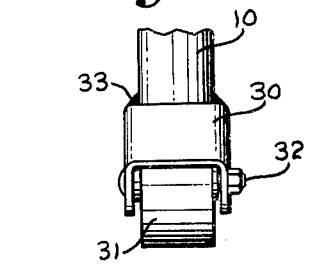


Fig. 5.



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Filed July 23, 1962 2 Sheets-Sheet 2

Fig. 3.

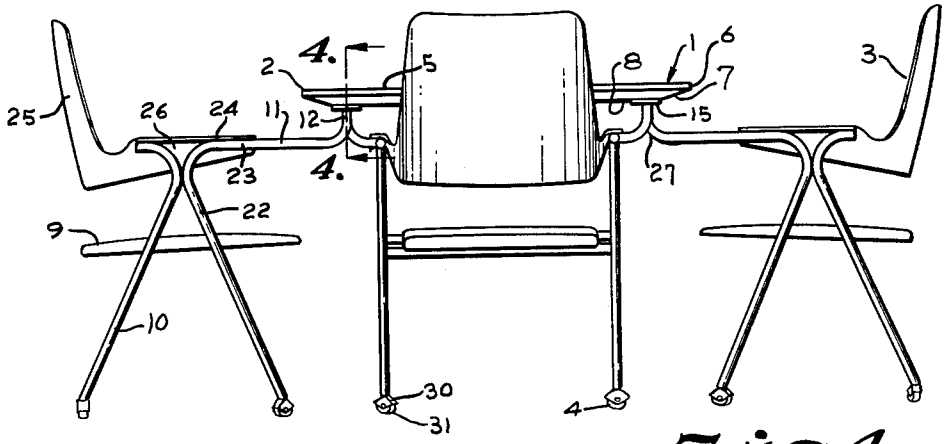


Fig. 6.

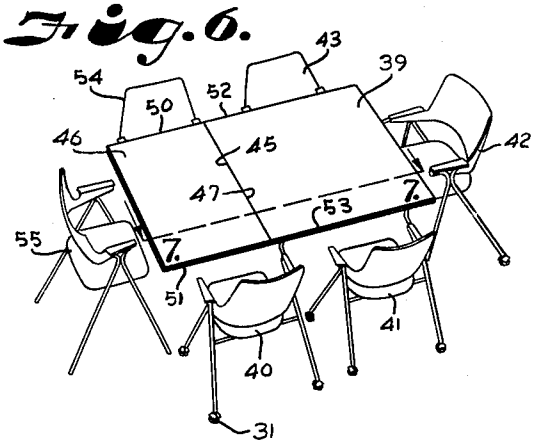


Fig. 4.

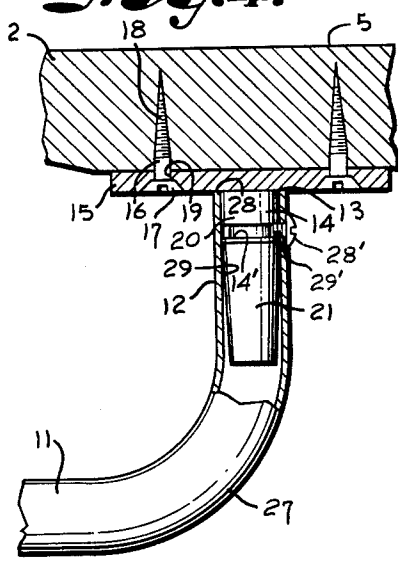
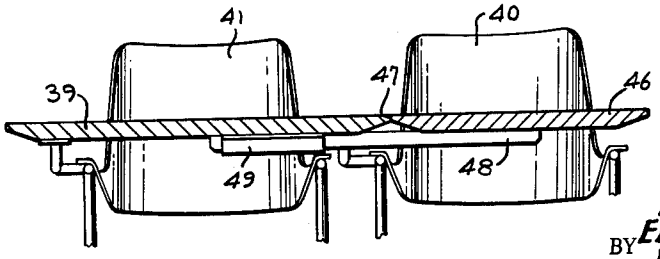


Fig. 7.



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TABLE AND CHAIR STRUCTURE

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This invention relates to articles of furniture, and more particularly to a table and chair structure.

The principal objects of the present invention are to provide a table and plurality of chairs combination in which the chairs are supported on rollers for movement of the chairs in a defined arcuate path relative to the table with a substantial absence of force tending to move the table position as the result of such chair movement; to provide a chair structure with supporting rollers having axes fixed relative to the chair and said axes extending through a vertical axis spaced from the chair whereby the chair moves on the rollers in an arc about said vertical axis; to provide a table and chair combination wherein a plurality of such chairs are spaced around the table with rigid means extending from the respective chairs and pivotally connected to the table on a respective vertical axis for swinging movement of the chair relative to the table; to provide such a structure wherein the respective vertical axis of the pivotal connection with the table intersects each of the axes of the rollers of the respective chair; to provide such a structure wherein the chairs serve as the sole supporting means for the table; to provide such a structure wherein the chairs are detachable to enable the chairs to be used separately; to provide such a table and chair combination with an extension table top with the chairs positioned whereby the chair normally positioned at the table edge adjacent the extension will swing to a position at an adjacent side edge of the table and corresponding edge of the extension; to provide a table and chair combination wherein the chairs have arms and the connections of the chairs to the table top are by rigid extensions from one of the chair arms with the pivotal connections of the chairs equally spaced inwardly from the table edges and the chairs spaced around said table; and to provide such a table and chair combination that is economical to manufacture, easily assembled and disassembled, that presents a structure having movable portions whereby it is easy to clean the supporting surfaces thereunder.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a perspective view of a table and chair combination constructed in accordance with the present invention and in assembled relation.

FIG. 2 is a plan view of the table and chair structure with the axes of the rollers of one chair indicated by broken lines that intersect with the vertical axis of swinging movement of the respective chair.

FIG. 3 is a side elevation of the table and chair structure.

FIG. 4 is a fragmentary vertical sectional view through the pivotal connection between the chair and table taken on the line 4–4, FIG. 3.

FIG. 5 is an elevational view of a roller carrier secured to a chair leg.

FIG. 6 is a perspective view of a table and chair combination and a table extension with the chairs positioned therearound.

FIG. 7 is a vertical sectional view through the table and extension taken on the line 7—7, FIG. 6.

Referring more in detail to the drawings:

The reference numeral 1 generally designates a table and chair structure which includes a table top 2 and a plurality of chairs 3 pivotally connected to the table top for swinging movement relative thereto with said chairs movably supported on roller assemblies 4 arranged with the axes of the rollers fixed relative to the respective chair. The table top can be made of any desired material and is not restricted as to shape. In the structure illustrated, the table top is polygonal and has an upper surface 5, side edges 6 and the bottom surface of said table top is preferably inclined downwardly and inwardly as at 7 terminating in a preferably flat bottom surface 8. In the structure illustrated, the table top is supported by the chairs and the chairs are spaced around said table top.

The chairs 3 include seat portions 9 and preferably have a plurality of spaced legs or support members 10 in supporting relationship thereto. Each of the chairs have a rigid member or extension 11 suitably fixed thereto and extending therefrom terminating in an end or bearing portion 12 pivotally mounted on a member 13 fixed to the table whereby the chair is adapted for swinging movement on a vertical axis through the bearing member 12. In the structure illustrated, the member 13 consists of a post or pin 14 suitably secured to the table top in depending relation thereto. The post is fixed to a plate 15 that is secured to the table top by suitable fastening devices such as screws 16 that have heads 17 engaging the plate 15 and threaded shanks 18 extending through apertures 19 therein. In the structure illustrated, the post 14 has a cylindrical portion 20 terminating in a downwardly extending tapered portion 21. The posts 14 are preferably spaced equidistantly around the table and equally spaced inwardly from the edges 6 thereof with the axes of the posts spaced laterally outwardly from one side of the respective chair when in its normal position for a person seated at the table.

In the structure illustrated, the chairs 3 have portions 22 extending above the seats 9 terminating in oppositely directed arm portions 23 supporting arm rests 24. The illustrated chairs have backs 25 with forwardly extending members 26 that include the arm rests 24 on the chair arms. The rigid member 11 is an extension of one of the arm portions 23 that extends from the chair arm toward the table and curves laterally outwardly to a position under the respective post 14. In the structure illustrated, the rigid portions 11 are tubular with the portion under the table curving upwardly as at 27 and terminating in a face 28 having supporting engagement with the plate 15. The tubular portion has a bearing portion 12 with an upwardly opening bore 29 that rotatably receives the post 14, whereby the rigid member 11 is spaced downwardly from the bottom surface 8 of the table top sufficiently that there is no danger of a person's hand positioned on the member 11 being pinched or scuffed on movement of the respective chair. In the illustrated structure, a fastening structure retains the post 14 in the bearing portion 12, said structure being a screw 28' threaded into a threaded bore 29' with an inner end positioned in a groove 14' in the post 14 whereby the rigid member is rotative on the post 14.

The chair legs or support members 10 have rigidly secured to the lower ends thereof roller carriers 30 which rotatably mount rollers 31 on axles 32 having axes fixed relative to the respective chair. In the structure illustrated, the carriers 30 are rigidly secured to the support members 10 as by welding as at 33. The rollers are arranged on the respective legs or supports 10 to engage the floor or supporting surface and support the respec-

tive chair movably as permitted by the rollers. The axes of the rollers are each in fixed relationship to the respective chair whereby each of the axes **34**, **35**, **36** and **37** of a chair, as illustrated in FIG. 2, intersects the vertical axis **38** of a respective post **14** on the table about which the respective chair is movable.

In the structure illustrated, the table top is supported solely by the chairs and their pivotal connections with said table top and the fixed arrangements of the axes of the rollers **31** relative to the vertical axes **38** is such that the chair may move toward and away from the sitting position at the table with each of said rollers tending to move in a defined path about said vertical axes whereby movement of the individual chair does not exert any lateral force on the table top and thereby does not alter the selected position of the table top. Also, the arrangement of the rollers on the respective chairs is such that if a lateral force is applied to a side of the table tending to change the table position, that force is resisted by the rollers on various chairs wherein the axes of the rollers are not perpendicular to the line of that force as such a force tends to move such rollers axially for any movement of the table top position. It is to be understood that while in the illustrated structure the table top is solely supported by the chairs, said table top can have independent support and, with the chairs rotatably connected to the table structure for movement about vertical axes with said vertical axes extending through common points of all of the axes of the rollers of the respective chairs, the chairs will have the relationships and movement relative to the table, as above described. It is also to be understood that the chair and roller structure as described may be connected to other furniture or members for captive movement relative thereto, and that the chair can be used separately and, with the arrangement of the axes of the rollers extending through a common vertical axis, movement of the chair on said rollers will be in an arc about that vertical axis. It is further to be understood that the rigid member **11** may be fixed relative to any rigid portion of the chair and extend under the table and have the pivotal connection therewith on the vertical axis **38** as heretofore described.

In assembling and using a table and chair structure, with the posts **14** secured to the table top in depending relation to the bottom surface **8** thereof and spaced around the table in the desired chair positions, the chairs may be provided in a similar arrangement and the table top lifted over the extensions **11** and the bearing members **12** aligned with the depending posts and then the table top lowered whereby the posts enter the bores **29**. Then the screw **28'** is tightened and the structure is then ready for use. A person desiring to sit at the table may grasp a chair **3** and pull same whereby the chair swings and/or rolls outwardly from the table edge, the swinging movement being about the vertical axis of the post for the respective chair. When the chair is swung out from the table edge, a person may be seated in the chair and then move toward the table whereby the chair moves on the rollers **31** in an arcuate path to swing back to the normal seating position for a person at the table edge. The table top is supported by the chairs and remains in position regardless of whether the chairs are at the seating position alongside the table or whether one or all of the chairs are swung outwardly from the table edge. The table top as illustrated will also be supported from the chairs even if two of the chairs are swung to a position alongside of the next adjacent chair whereby the chairs are in pairs arranged in side by side relationship at opposed sides of the table top.

In the structure illustrated in FIGS. 6 and 7, the table top **39** has chairs **40**, **41**, **42** and **43** of the structure corresponding to that described relative to the chair **3**, with each of said chairs rollingly mounted on rollers **31** having their axes fixed relative to the respective chair. Each of said chairs are mounted relative to the table top but the chair **40** which normally would be positioned at the side edge **45** of the table is swung about its respective vertical axis to a side by side position with the chair **41**. A table top extension **46** is mounted with its edge **47** abutting the edge **45** of the table top **39** and, in the illustrated structure, said table top extension **46** is supported by arms **48** that extend in sockets **49** fixed under the table top **39**. However, it is to be understood that the extension may be otherwise suitably supported in the abutting relationship to the table top **39** whereby the side edges **50** and **51** of the extension are in alignment with corresponding side edges **52** and **53** respectively of the table top **39**, as illustrated in FIG. 6. With this arrangement, the chair **40** is swingably connected to the table top **39** and is positioned in seating position along the edge **51** of the extension. The table top **39** is supported by the chairs **40**, **41**, **42** and **43**. Additional chairs **54** and **55** may be arranged at other places at the table extension as illustrated in FIG. 6. The chairs **54** and **55** may be separate chairs or they may be arranged with rollers and swingably mounted to the extension if desired. It is also to be understood that a similar extension may be arranged on the opposite side of the table top **39** and additional chairs supplied if desired. It is to be understood that with this arrangement the size of the table top and the number and arrangement of chairs is adapted for small tables or for large tables according to the number of people desired to be seated at the table and, also, due to the arrangement of the captive swinging movement of the chairs, the table and chair structures may be arranged with suitable spacing from adjacent table and chairs with a desired aisle space therebetween substantially maintained and, furthermore, that the floor surface under the table and chair combinations can be easily cleaned due to the unobstructed area under the table top and the movable relationship of the chairs.

It is to be understood that while we have illustrated and described certain forms of our invention, it is not to be limited to the specific forms or arrangements of parts herein described and shown except insofar as such limitations are included in the claims.

What we claim and desire to secure by Letters Patent is:

1. A table and chair combination comprising,

(a) a table top,

(b) a plurality of chairs spaced around said table top,

(c) means extending from each of said chairs and pivotally connected relative to said table top for swinging movement of said chairs about respective vertical axes,

(d) and a plurality of spaced floor-engaging rollers on said chairs for rollingly supporting same independently of the connection with the table top with the rolling axes of the rollers of the respective chair being fixed relative thereto with said axes on respective lines intersecting the vertical axis of movement of the respective chair so that the roller positions define an arc on which said chair rolls about said respective vertical axis with an absence of responsive movement of the table top and independently of swinging movement of the other chairs about their respective axes.

2. A table and chair combination comprising,

(a) a table top,

(b) a plurality of chairs spaced around said table top,

(c) rigid means extending from each of said chairs under the table top and pivotally connected relative to said table top for swinging movement of said chairs about respective vertical axes,

(d) and a plurality of spaced floor-engaging rollers on said chairs for rollingly supporting same independently of the connection with the table top with the rolling axes of the rollers of the respective chair being fixed relative thereto with said rolling axes on respective lines intersecting the vertical axis of move-

ment of the respective chair so that the roller positions define an arc on which said chair is rollable about its respective vertical axis with an absence of responsive lateral force on said table top due to such rolling movement.

3. A table and chair combination of claim 2 wherein:
(a) the chairs and the extending means thereon form the sole support for the table top and the combination is characterized by said table top remaining in selection position during rolling movement of the chairs about the respective vertical axes of their connection with the table top.

4. A table and chair combination comprising:
(a) a table top,
(b) a plurality of chairs spaced around said table top,
(c) said chairs each having a plurality of legs,
(d) rigid means connected to each of said chairs and terminating in an end spaced from the respective chair,
(e) means connecting the respective ends of said rigid means to the table top in supporting engagement therewith, said connecting means permitting swinging movement of said chair relative thereto about a vertical axis whereby said respective rigid means and chair will move about said vertical axis,
(f) and a plurality of spacer means including floor-engaging rollers movably supporting said chairs for rolling movement on a floor independently of the connection with the table with said means for each chair fixed to the legs thereof and the rollers thereof having their respective rolling axes fixed relative to the respective chair and on lines intersecting the vertical axis about which the respective chair is movable so that the roller positions define an arc on which said chair is rollable about its respective vertical axis and the rollers of all of the chairs cooperate in retaining the table top in selected position by resisting lateral movement thereof.

5. A chair structure comprising:
(a) a seat member,
(b) a plurality of spaced legs connected to said seat member in supporting relation thereto,
(c) a roller carrier fixed to each of said legs,
(d) and a floor-engaging roller on each carrier and rotatable on an axis with the rolling axes of the rollers all being fixed relative to said seat member and intersecting at a single point spaced from said legs so that the roller positions define an arc of movement of the chair in rolling of the rollers on a floor with said arc being about a vertical axis extending through said single point, said chair being characterized by its movement in said arc about said vertical axis and the absence of any connection with any fixed pivot on the floor.

6. A chair structure as set forth in claim 5 wherein:
(a) an extension is fixed relative to said seat member and has a bearing portion on said vertical axis in vertically spaced relation to the point thereon intersected by said roller axes, said bearing portion being adapted for connection to a member relative to which the chair is movable, said chair being movable in an arc about said vertical axis with an absence of any lateral force on said connection member due to such chair movement.

7. A table and chair combination comprising:
(a) a table top,
(b) a plurality of chairs spaced around said table top,
(c) said chairs each having a plurality of legs,
(d) rigid means connected to each of said chairs and terminating in an end spaced from the respective chair and adapted to be positioned under said table top with the respective chair arranged for a person to sit at said table,
(e) means pivotally connecting the respective ends of said rigid means to the table top in supporting engagement therewith, said pivotal connecting means permitting swinging movement of said chair relative thereto on a vertical axis whereby said respective rigid means and chair will move about said vertical axis,
(f) and means including floor-engaging rollers movably supporting said chairs for rolling movement on a floor with said means for each chair fixed one to each leg thereof and the rollers thereof having their respective rollings axes fixed relative to the respective chair and on lines intersecting the vertical axis about which the respective chair is movable,
(g) said chairs being the sole support of the table top with each of the chairs rollable in an arc about its respective vertical axis,
(h) said roller axes of the rollers on the chairs being arranged whereby in all positions of said chairs lateral movement of the table top is resisted by rollers having their axes substantially in the direction thereof.

8. A table top and chair combination comprising:
(a) a table top of generally polygonal shape,
(b) said table top having side edges with adjacent edges intersecting in corners,
(c) a plurality of chairs spaced around said table top with said chairs adapted to be positioned one to a side edge for a person to sit at said table,
(d) said chairs each having a plurality of legs,
(e) said chairs each having arms,
(f) rigid means connected to each of said chairs as an extension of one of said arms of a respective chair and extending therefrom under the table top and terminating in an end,
(g) means adjacent each of the corners of the table for pivotally connecting an end of said rigid means of a respective chair to the table top in supporting engagement therewith, said pivotal connecting means permitting swinging movement of said chair relative thereto on a vertical axis whereby said respective rigid means and chair will move about said vertical axis,
(h) and floor-engaging roller carrier means fixed on each of said chair legs whereby the rollers support said chairs for rolling movement on a floor with each of said rollers of a chair having its respective rolling axis fixed on a line intersecting the vertical axis about which the respective chair is movable, said table top and chair assembly being characterized by the table top being wholly supported by said movable chairs and remaining stationary during movement of a chair in its respective arc about its respective vertical axis.

9. A table top and chair combination comprising:
(a) a table top of generally rectangular shape,
(b) said table top having side edges with adjacent edges intersecting in corners,
(c) a plurality of chairs spaced around said table top with said chairs adapted to be positioned one to a side edge for a person to sit at said table,
(d) said chairs each having a plurality of legs,
(e) said chairs each having arms,
(f) rigid means connected to each of said chairs as an extension of one of said arms of a respective chair and extending therefrom under the table top and terminating in an end,
(g) means adjacent each of the corners of the table for pivotally connecting an end of said rigid means of an adjacent chair to the table top in supporting engagement therewith, said pivotal connecting means permitting swinging movement of said chair relative thereto on a vertical axis whereby said respective rigid means and chair will move about said vertical axis and said table top is wholly supported by said chairs,
(h) floor-engaging roller carrier means fixed on each

of said chair legs whereby the rollers movably support said chairs for rolling movement on a floor with each of said rollers of a chair having its respective rolling axis fixed on a line intersecting the vertical axis about which the respective chair is movable whereby each chair rolls in an arc about its respective vertical axis with an absence of responsive movement of the table top and independently of swinging movement of the other chairs about their respective axes,

(i) and an extension table top arranged at a side edge of said table top and adapted to be fixed relative thereto, said chair normally arranged at the side edge of the table top in which the extension table top is positioned being rollable in an arc about its respective vertical axis to a sitting position at a side edge of the table top and extension table adjacent to the pivotal mounting of said rigid means of the respective chair.

10. A chair and table combination comprising:

(a) a table top having an upper surface and a bottom surface,

(b) a plurality of chairs spaced around the table top,

(c) said chairs each having a plurality of spaced legs,

(d) said chairs each having at least one arm,

(e) an extension for each chair and rigid with an arm thereof, said extension extending under the table top in vertically spaced relation to the bottom surface thereof,

(f) a bearing member for each chair fixed to the table top, said bearing members being equi-distantly spaced from adjacent bearing members and having equal spacing inwardly from the table edge at which a respective chair is positioned for seating of a person at the table,

(g) means pivotally connecting an extension of a chair to a respective bearing member in table top supporting relation, said pivotal connecting means permitting relative movement about a vertical axis extending therethrough whereby said chair is movable

relative to the table top about said respective vertical axis,

(h) a roller carrier fixed to each of said legs of the chairs for supporting the respective chairs for rolling movement on a floor,

(i) and a floor-engaging roller on each carrier and rotatable on a horizontal axis with the rolling axes of the rollers of a chair all having a fixed relationship and intersecting substantially at a common point, the respective vertical axis about which the respective chair is rollable,

(j) said chairs and their connection with the table top being the sole support of the table top with the structure being characterized by the table top remaining in selected position during movement of the chairs which are individually rollable relative to the table top in an arc toward and away from a table edge at which the chair is adapted to be positioned for seating of a person at the table.

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