United States Patent

Barecki et al.

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[54] CONNECTOR ASSEMBLY FOR CHAIRS

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[52] **U.S. Cl.**.....**297/248,** 297/239

[51] **Int. Cl.**.....**A47c 1/124**

[58] **Field of Search** 297/248, 249; 108/64

[56] **References Cited**

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[57] **ABSTRACT**

A connector assembly for releasably connecting a pair of adjacent chairs includes a male connector and a female connector, each of the connectors including an elongated generally channel-shaped body adapted to be secured to a tubular supporting base of the chair. The female connector includes an elongated slotted flange which extends laterally outwardly and upwardly from one of the sides of the connector and a second flange which extends laterally outwardly from the bottom of that side. The male connector includes a flange which extends laterally outwardly and upwardly from one side thereof and which can be inserted into the slotted flange of the female connector. The side of the male connector from which the flange extends is shorter than the other side of the connector, and the short side abuts the female connector and is supported by the second flange thereof when the connectors are interlocked.

10 Claims, 8 Drawing Figures

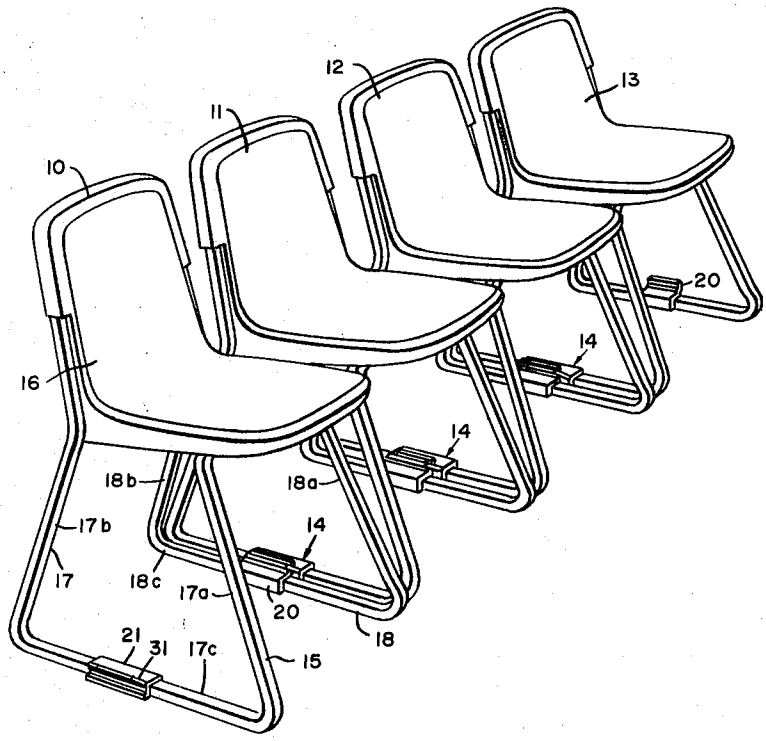

FIG. 1

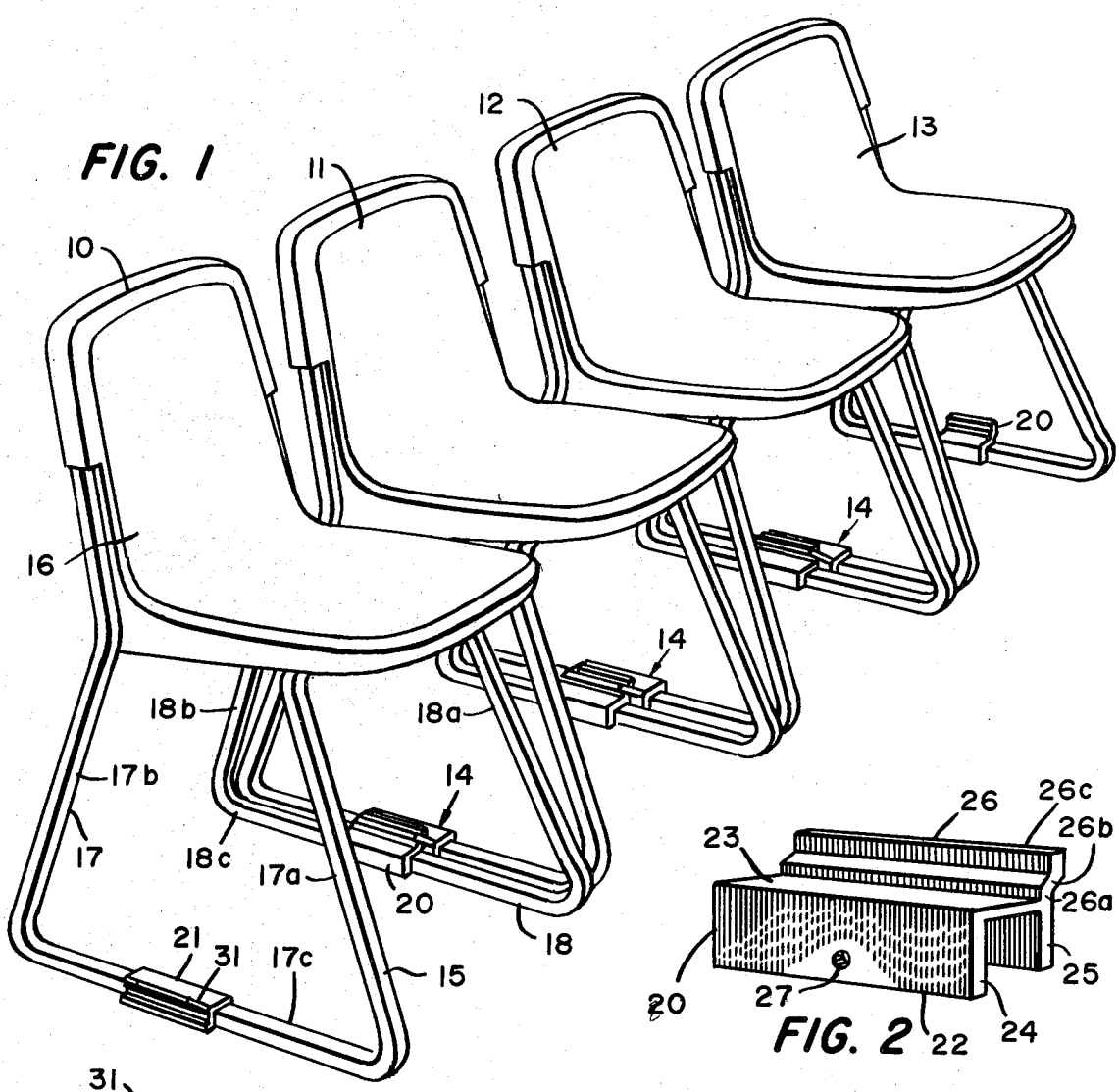

FIG. 2

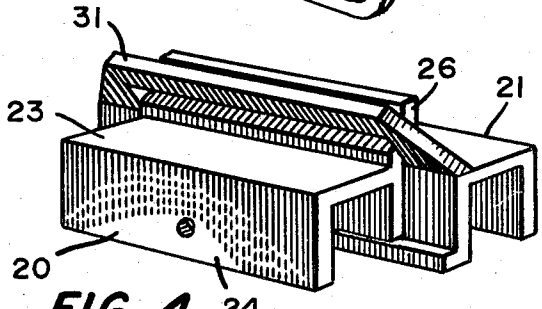

FIG. 4

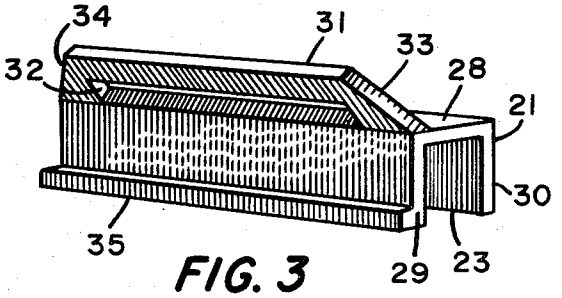

FIG. 3

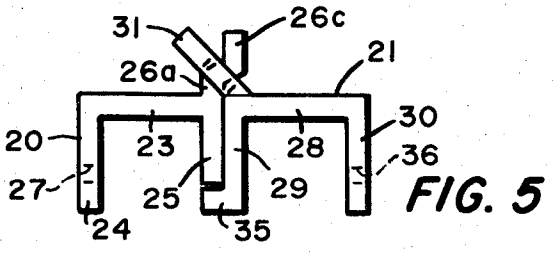

FIG. 5

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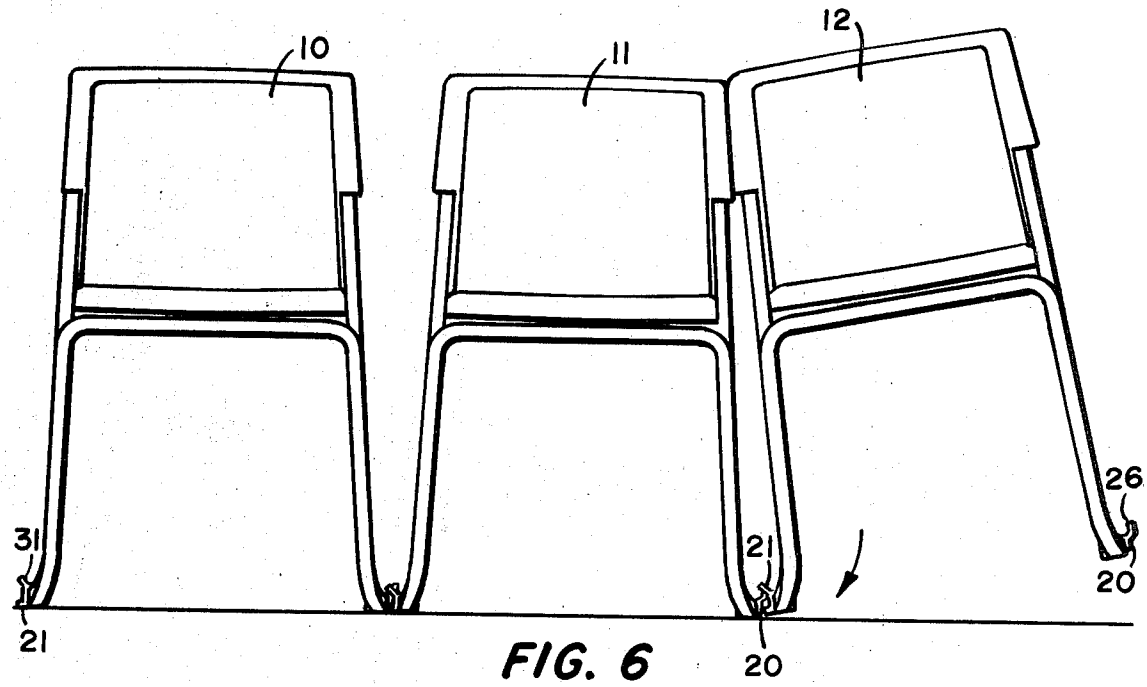

FIG. 6

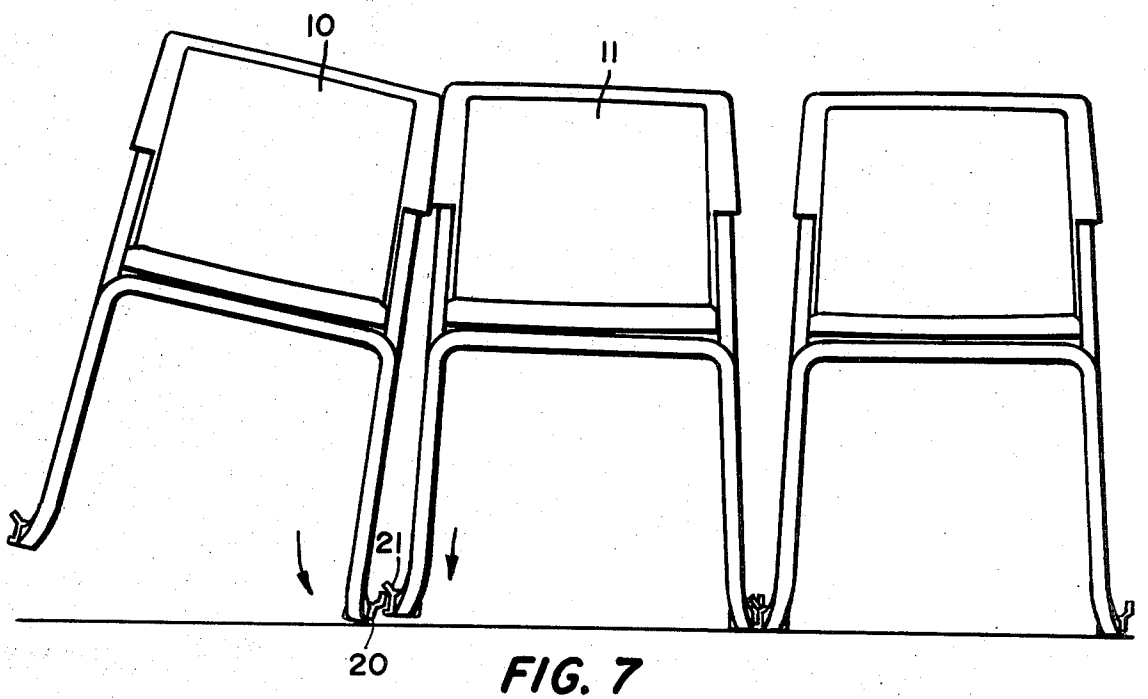

FIG. 7

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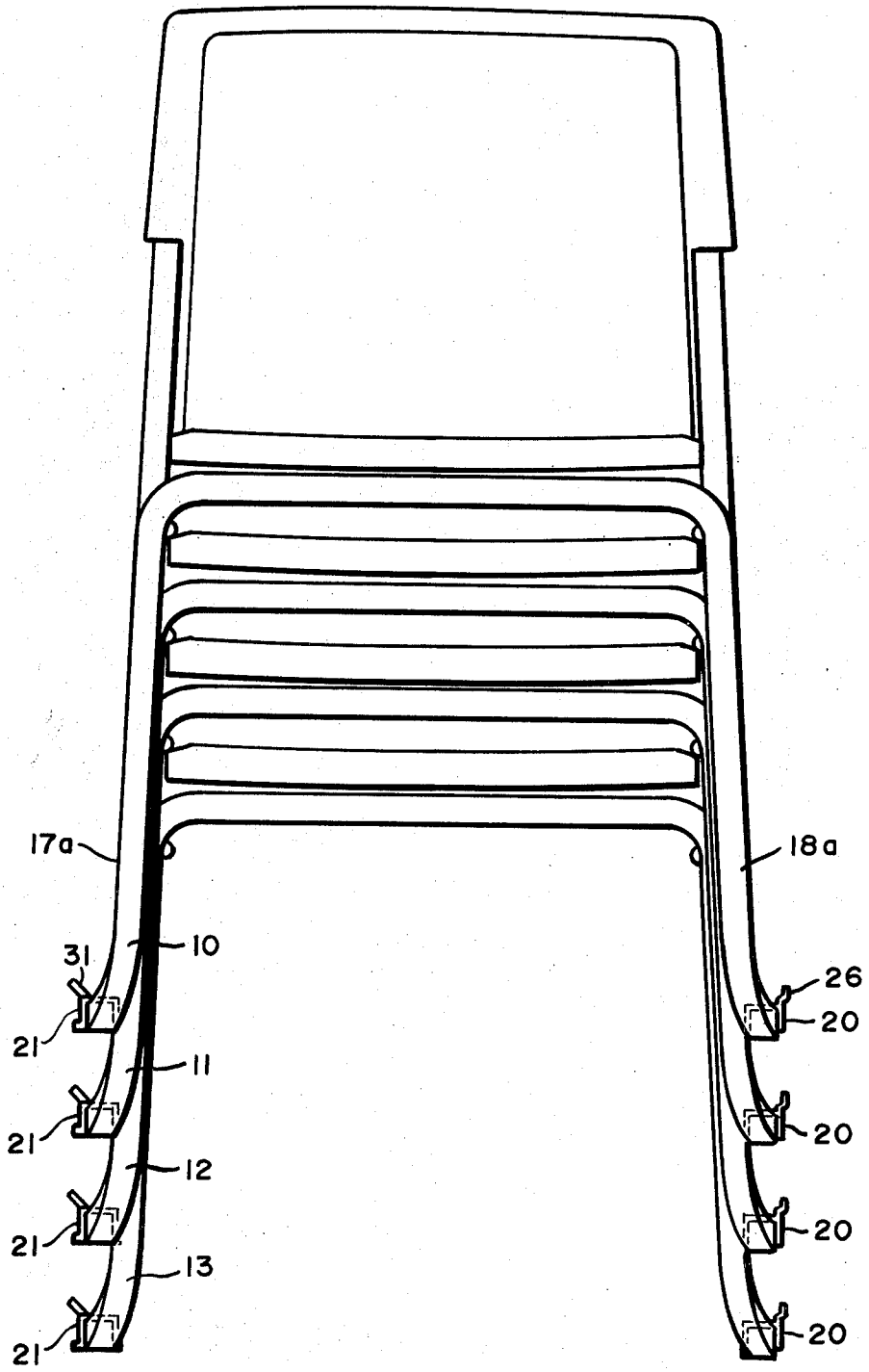

FIG. 8

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CONNECTOR ASSEMBLY FOR CHAIRS

BACKGROUND AND SUMMARY

This invention relates to chair connectors, and, more particularly, to a connector assembly which is particularly suitable for use with stacking chairs.

Stacking chairs, i.e., chairs having supporting bases which permit a plurality of chairs to be stacked one upon the other, are commonly used and are particularly desirable when chairs are to be alternately stored and used. When the chairs are to be used, each chair is lifted from the stack and arranged as desired. Frequently, it is desired to arrange the chairs in rows and to interconnect adjacent chairs to provide a relatively rigid assembly. Heretofore, however, when connecting means were attached to stacking chairs, the ability to stack the chairs without removing the connecting means was generally lost or reduced.

The invention provides connecting means which can be secured to stacking chairs for permitting adjacent chairs to be releasably interconnected but which do not interfere with the stackability of the chairs. Each of the connectors include a tubular body which can be readily fitted over the tubular frame of the chair, and the interlockable flanges thereof extend laterally outwardly from the chair so that the flanges do not hinder stacking. The male and female connectors can be used interchangeably on the right or left side of the chair, and when the connectors are interlocked, adjacent chairs are substantially secured against movement in any direction.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of four sled-base chairs arranged in a row and joined with chair connector assemblies formed in accordance with the invention;

FIG. 2 is a perspective view of the male connector;

FIG. 3 is a perspective view of the female connector;

FIG. 4 is a perspective view of the interlocked connectors;

FIG. 5 is an end view of the interlocked connectors;

FIG. 6 is a front view of three chairs showing the right chair being connected to the middle chair;

FIG. 7 is a view illustrating a different manner of connecting adjacent chairs; and

FIG. 8 is a front view of a plurality of chairs stacked in the storage position.

DESCRIPTION OF SPECIFIC EMBODIMENT

Referring to FIG. 1, four stacking chairs, **10, 11, 12** and **13** are arranged in a row, and each pair of adjacent chairs is releasably connected by a connecting assembly designated generally by the numeral **14**. The stacking chairs are conventional, and each chair includes a tubular metal supporting frame **15** which supports a molded plastic seat **16**.

The supporting frame or base **15** is of the sled-base type and includes generally trapezoidally shaped right and left hand legs **17** and **18**, respectively, which are formed by inclined front and rear braces and a bottom runner. The right hand leg **17** includes upwardly converging braces **17*a*** and **17*b*** and an elongated straight runner **17*c***, and the left hand leg includes converging braces **18*a*** and **18*b*** and runner **18*c***. As can be seen best in FIG. **8**, the supporting braces **17*a***, **17*b***, **18*a*** and **18*b*** curve laterally outwardly adjacent the runners to permit the runners of each chair to be positioned laterally outwardly of the supporting braces of the chairs therebelow so that the chairs **10–13** can be nested or stacked for storing in a compact manner. When the chairs are stacked, the generally L-shaped seat of each chair receives and supports the seat of the chair immediately thereabove.

Referring now to FIGS. **2–5**, each connector assembly **14** includes a male connector **20** and a female connector **21**. The particular tubular runners **17*c*** and **18*c*** illustrated are generally rectangular in transverse cross section, and the male and female connectors include generally channel-shaped body portions **22** and **23**, respectively, which are sized to fit relatively snugly over the runners. The elongated body **22** of the male connector is generally U-shaped in transverse cross section and includes a top wall or web **23** and a pair of spaced-apart generally parallel side walls **24** and **25** which extend downwardly from the top wall. A connecting flange **26** extends laterally outwardly and upwardly from the corner or juncture between the top wall **23** and the side wall **25**, and the connecting flange includes a first portion **26*a*** which extends upwardly from the top wall in alignment with the side wall **25**, an inclined intermediate portion **26*b*** which extends laterally outwardly and upwardly from the first portion at an angle of about 135° thereto, and an outer portion **26*c*** which extends parallel to the first portion to form a somewhat S-shaped connecting flange. As will be explained more fully hereinafter, the side wall **25** is shorter than the side wall **24**, and the side wall **24** is provided with a central opening **27** for receiving a screw for attaching the connector to the chair runner.

The channel-shaped body **23** of the female connector **21** is also generally U-shaped in transverse cross section and includes a top wall or web **28** and a pair of spaced-apart parallel side walls **29** and **30**. A connecting flange **31** extends laterally outwardly and upwardly from the corner or juncture between the side wall **29** and the top wall **28** and is provided with a longitudinally extending slot **32** therethrough. The flange **31** extends at an obtuse angle with respect to both the top wall **28** and the side wall **29**, and in the connector illustrated this angle is 135°. If desired, the longitudinal ends of the flange can be provided with tapered edges **33** and **34**. The side walls **29** and **30** are of equal length in the vertical direction as viewed in FIG. **5**, and a second flange **35** extends laterally outwardly from the bottom of the wall **29** generally perpendicularly thereto. The female connector is also provided with an attachment opening **36** through central portion of the side wall **30** for securing the connector to the chair runner.

A male and female connector is secured to the base of each chair, and the male and female connectors can be used interchangeably on either the right or left hand runners of a chair. However, once a particular connector is placed on a particular side of a chair, the same type of connector should be secured to the same side of the other chairs. Each connector is secured to the chair runners so that the connecting flange thereof extends laterally away from the chair, and the connectors are advantageously secured in about the central portion of the runners. Referring to FIG. **1**, a female connector **21**

is secured to the right hand runner 17c with the connecting flange 31 thereof extending laterally away from, or to the right of, the chair, and a male connector 20 is secured to the left hand runner 18c with the connecting flange thereof extending laterally away from, or to the left of, the chair. Similarly, female connectors are secured to the right hand runners of the other chairs 11–13, and male connectors are secured to the left hand runners thereof.

The connecting flange on the male connector is slightly shorter than the longitudinal dimension of the slot 32 in the female connecting flange, and the male flange can be inserted through the slot to releasably interconnect the male and female connectors and the chairs to which they are attached. Referring to FIG. 6, the chair 12 can be connected to the chair 11 by tilting the chair 12 to permit the slot of the connecting flange of the female connector attached to the right runner of chair 12 to be positioned over the connecting flange of the male connector 20 attached to the left runner of chair 11. As can be seen best in FIG. 5, the width of the slot is slightly greater than the thickness of the male connecting flange, and the slotted female flange can be inserted first over the outer portion 26c of the male flange and then, by returning the chair 12 to the upright position, over the intermediate portion 26b of the male flange. The side wall 25 of the male connector terminates above the lower end of the side wall 24 a distance approximately equal to the thickness of the flange 35 of the female connector, and as the chair 12 is returned to the upright position, the flange 35 snaps into place below the side wall 25. The length of the intermediate portion 26b of the male flange between the portions 26a and 26c is approximately equal to the dept of the slot 32, and when the connectors are interlocked as shown in FIG. 5, the side wall 25 abuts the side wall 29 and is supported by the flange 35. The intermediate portion 26b of the male flange extends through the slot of the female flange generally perpendicularly to the female flange, and the vertically extending portions of the male flange substantially prevent horizontal or vertical separation of the connectors. The longitudinal dimention of the male flange is just slightly less than the longitudinal dimension of the slot 32, and relative fore-and-aft movement of the connectors is also substantially prevented. Separation of the connectors can be accomplished only by tilting one of the chairs relative to the other to permit the female flange to be slipped upwardly over the outer portion 26c of the male flange.

Another method of interconnecting adjacent chairs is shown in FIG. 7, in which chair 10 having a male connector on the left side thereof is to be interconnected to chair 11 having a female connector on the right side thereof. The chair 10 is tilted to its left side to permit the male connecting flange to be positioned below the female connecting flange on the chair 11. When the chair 10 is returned toward its upright position, the right leg of the chair 11 will be raised sufficiently to permit the male connecting flange to be inserted into the slotted female connecting flange. As the two chairs return to the upright position, the intermediate portion of the male flange slips into the slot and the bottom flange 35 of the female connector snaps into place below the short side wall of the male connector.

Adjacent chairs can be quickly disconnected merely by following the reverse procedure. The chair carrying the female connector need merely be tilted toward the adjacent chair to permit the female connecting flange to be lifted over the outer portion 26c of the male connecting flange on the adjacent chair. If the end chair is connected to the adjacent chair by a male connector, the end chair can be tilted toward the adjacent chair while the adjacent chair is raised slightly to permit the male connecting flange to be withdrawn from the female connecting flange of the adjacent chair.

After the chairs have been disconnected, they can be stacked as shown in FIG. 8 without removing the connectors therefrom. The male connectors are secured to the right side of each chair and the female chairs are secured to the left side of each chair. Since the connecting flanges thereof extend laterally away from the chairs, the supporting base of each chair can be inserted over the supporting base of the chairs therebelow without interference from the connectors.

The male and female connectors can be manufactured economically from extruded plastic which is cut to length to form the individual connectors, and very little machine work is required.

While in the foregoing specifications a detailed description of a specific embodiment of the invention was set forth for the purpose of illustration, it is to be understood that many of the details herein given may be varied considerably by those skilled in the art without departing from the spirit and scope of the invention.

We claim:

1. A connector assembly for releasably connecting a pair of adjacent chairs having tubular base members comprising a pair of interlockable connectors, each of the connectors having an elongated generally channel-shaped body adapted to be secured to the base member of a chair, one of the connectors having a longitudinally slotted flange extending generally laterally away from the channel-shaped body thereof, said one connector adapted to be secured to a chair so that the flange thereof extends generally laterally away from the chair, the other connector having a flange extending from the channel-shaped body thereof, the flange of the other connector having a length less than the length of the slot in the slotted flange and being receivable therein whereby the connectors can be releasably interlocked.

2. The connector assembly of claim 1 in which the body of each of the connectors is generally U-shaped in transverse cross section and includes a web portion and a pair of generally spaced-apart side walls extending generally perpendicularly from the web portion.

3. The connector assembly of claim 2 in which the slotted flange of said one connector extends from the juncture of one of the side walls with the web portion at an obtuse angle with respect to both said one side wall and the web portion.

4. The connector assembly of claim 2 in which the flange of said other connector extends from the juncture of one of the side walls with the web portion and includes a first portion extending generally parallel to said one side wall, a second portion extending angularly from the first portion away from said one side wall, and a third portion extending from the second portion generally parallel to said one side wall.

5. The connector assembly of claim 1 in which the body of each of the connectors is generally U-shaped in transverse cross section and includes a web portion and a pair of generally parallel spaced-apart side walls extending generally perpendicularly from the web portion, the slotted flange of said one connector extending from the body thereof at the juncture of one of the side walls with the web portion at an obtuse angle with respect to both said one side wall and the web portion, the flange of said other connector extending from the body thereof at the juncture of one of the side walls with the web portion and including a first portion extending generally parallel to said one side wall of the other connector, a second portion extending angularly from the first portion away from said one side wall of the other connector, and a third portion extending from the second portion generally parallel to said one side wall of the connector.

6. The connector assembly of claim 5 in which the length of the second portion is substantially the same as the depth of the slot and the thickness of the second portion is substantially the same as the width of the slot whereby substantial movement of the second portion within the slot is restrained.

7. The connector assembly of claim 2 in which the slotted flange of said one connector extends laterally outwardly beyond one of the side walls of said one connector, said one connector including a second flange extending laterally outwardly from the end of said one side wall thereof, the flange of said other connector extending laterally outwardly beyond one of the side walls of the other connector, said one side wall of the other connector terminating short of the other side wall of the other connector by a distance substantially equal to the thickness of the second flange of said one connector whereby said one side wall of the other connector may be positioned above the second flange when the connectors are interlocked.

8. A connector assembly for releasably connecting a pair of adjacent chairs having tubular base members comprising first and second interlockable connectors, each of the connectors having an elongated generally U-shaped channel-shaped body adapted to be secured to the base member of a chair and including a top wall and a pair of generally parallel spaced-apart side walls extending generally perpendicularly from the top wall, the first connector including a longitudinally extending generally planar connecting flange extending laterally from the body thereof beyond one of the side walls, the connecting flange extending at an obtuse angle with respect to the top wall of the first connector and being provided with a longitudinally extending slot therethrough, a second generally planar flange extending laterally outwardly from said one side wall of the first connector generally perpendicularly to the one side wall, the second connector including a longitudinally extending connecting flange having a first portion extending from the top wall of the second connector generally parallel with one of the side walls thereof, a second portion extending angularly from the first portion laterally beyond said one side wall of the second connector, and a third portion extending from the second portion generally parallel with the first portion, the longitudinal dimension of the connecting flange of the second connector being less than the longitudinal dimension of the slot in the connecting flange of the first connector, said one side wall of the second connector terminating short of the other side of the wall of the second connector by a distance substantially equal to the thickness of the second flange of the first connector, the lengths of the other side wall of the second connector and the side walls of the first connector being substantially the same, whereby the connecting flange of the second connector can be inserted through the slot of the connecting flange of the first connector to position the second portion thereof in the slot and the one side wall of the second connector can be positioned above the second flange of the first connector.

9. The connector assembly of claim 8 in which the transverse dimension of the second portion of the connecting flange of the second connector is substantially the same as the depth of the slot and the thickness of the second portion is substantially the same as the width of the slot whereby substantial movement of the second portion within the slot is restrained.

10. The connector assembly of claim 8 in which the included angle between the second portion of the connecting flange of the second connector and the top wall of the second connector is about 135° and the included angle between the connecting flange of the first connector and the top wall of the first connector is about 135°.

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