Jan. 24, 1967 M. R. SCHULTZ 3,299,840

FURNITURE CONNECTION

Filed Nov. 8, 1965

Fig. 1.

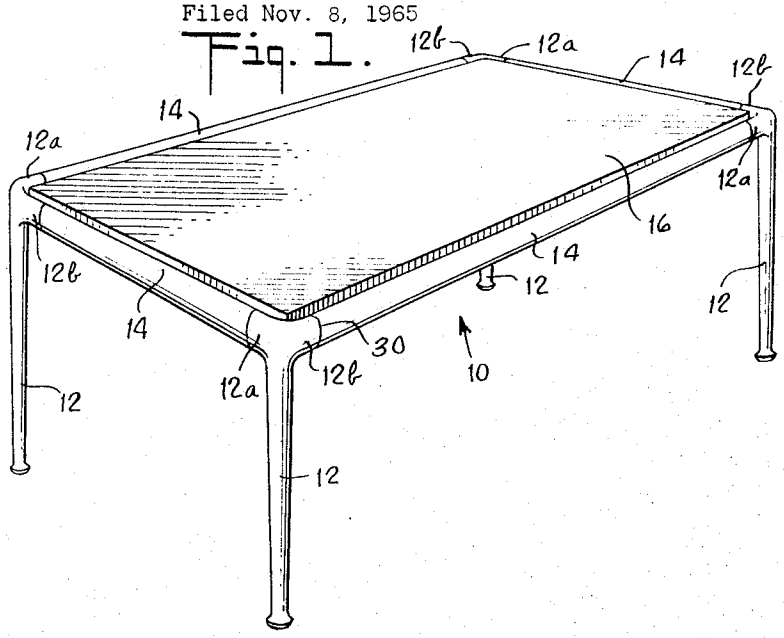


Fig. 5.

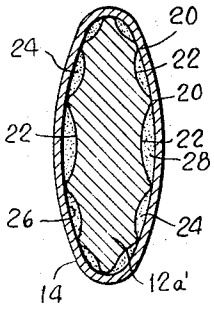


Fig. 2.

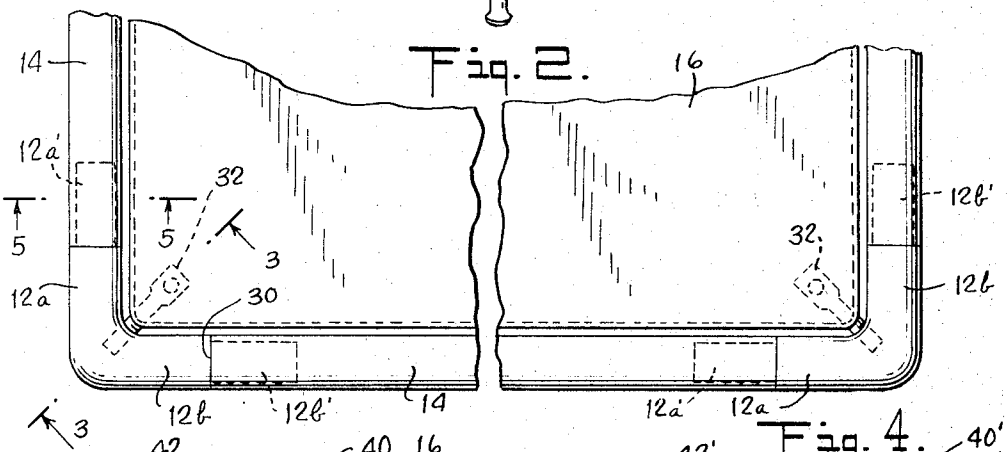


Fig. 4.

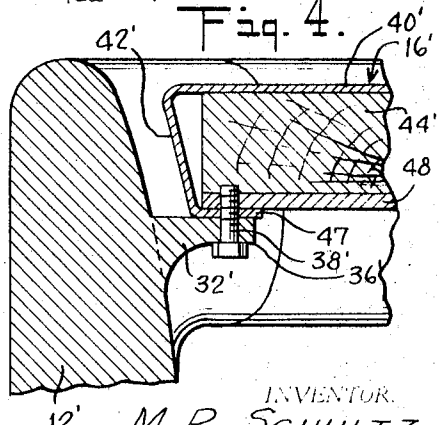
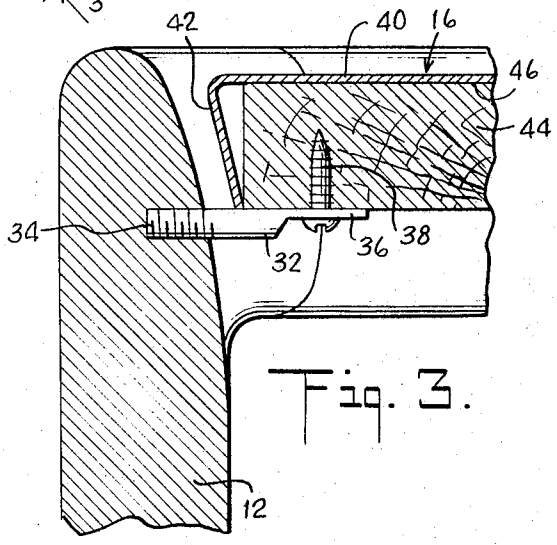


Fig. 3.



INVENTOR.
M. R. SCHULTZ
BY
Dexter W. Clark
ATTORNEY

United States Patent Office 3,299,840 Patented Jan. 24, 1967

3,299,840

FURNITURE CONNECTION

Moses Richard Schultz, Barto, Pa., assignor to Knoll Associates, Inc., New York, N.Y., a corporation of New York

Filed Nov. 8, 1965, Ser. No. 506,760
3 Claims. (Cl. 108—157)

This invention relates to a connection, and particularly to a furniture connection. The connection of the invention is provided for joining together two members, such as a leg of an article of furniture and a stretcher for the furniture article.

In the fabrication of furniture, for example, it is necessary to join the legs of an article of furniture to the stretchers of the frame, if the stretchers and the legs are not molded integrally as a single piece. Integral molding of legs and stretchers is not common. The present invention is directed to providing a connection that is sturdy as well as pleasing in appearance.

Accordingly, an object of the present invention is to provide an improved connection, typically useful in the fabrication of furniture.

A further object of the present invention is to provide an improved connection between the legs of an article of furniture and the stretchers of the furniture article.

A further object is to provide an improved table structure.

These and other objects of the present invention are achieved by the use of a stud as one part of the connection. The stud is advantageously elliptical in section and includes a plurality of ribs on an outside surface thereof. Adjacent ribs define a groove therebetween. The other part of the connection comprises a tubular member positioned over the stud, with an inside surface of the tubular member in contact with the ribs of the stud. An adhesive material is employed to secure the stud and the tubular member together and is advantageously positioned in the spaces between the grooves of the stud and the inside surface of the tubular member.

When the legs and stretchers of an article of furniture define a suitable support for a table top, with the stretchers completing a peripheral frame for the table top, the present invention contemplates positioning the table top within the frame so that the edges of the table top are spaced from the frame. Supporting lugs extend inwardly from the frame and are attached to the underside of the table top to support the table top within the frame. The sides of the table top advantageously extend downwardly and inwardly so as to provide a pleasing appearance, while facilitating in the positioning of the table top within the frame.

The invention will be more completely understood by reference to the following detailed description. In the accompanying figures:

FIG. 1 is a perspective view of an article of furniture, namely a table, embodying the present invention.

FIG. 2 is a fragmentary plan view of the table of FIG. 1.

FIG. 3 is an enlarged sectional view of a portion of the table of FIG. 1, taken along the section line 3—3 of FIG. 2 and looking in the direction of the arrows of that figure, showing the details of the connection of the table top to the table frame.

FIG. 4 is a sectional view similar to that of FIG. 3 showing the details of an alternative form of connection between table top and table frame.

FIG. 5 is an enlarged sectional view of a portion of the table of FIG. 1, taken along the section line 5—5 of FIG. 2 and looking in the direction of the arrows, showing the details of a furniture connection embodying the present invention.

Referring to FIG. 1, a table **10** is shown having four vertical legs **12**. The legs **12** may be solid, or they may be tubular if desired. Each leg **12** is terminated at its upper end by lateral extensions **12***a* and **12***b*, each of which extends toward an adjacent leg of the table. Stretchers **14** serve to connect together the legs **12** and to complete a frame for top **16** of the table.

FIG. 2 shows the details of the connections between the stretchers **14** and the vertical legs **12**. As will be noted, each leg extension **12***a* is terminated by a corresponding stud **12***a'*, while all leg extensions **12***b* are terminated by a corresponding stud **12***b'*. The studs **12***a'* and **12***b'* are advantageously identically formed; FIG. 5 shows a stud **12***a'* in section. Each stud is normally elliptical in section; however, this is arbitrary. The exterior surface of the stud includes a plurality of ribs **20** thereon, adjacent ones of which define a groove **22** therebetween. The ribs and grooves extend generally parallel to the longitudinal axis of the stud, although this relationship is not essential. The grooves **22** on the outside surface of the stud provide spaces **24** between the stud and inside surface **26** of the stretcher **14**. It should be noted that the ends of the stretchers **14** adjacent to the studs **12***a'* and **12***b'* are tubular so that each stretcher end may be positioned over the corresponding stud, as shown in FIGS. 2 and 5. The portion of each stretcher **14** between the ends of the stretcher could be solid, however, if desired.

The ribs **20** of the studs **12***a'* and **12***b'* thus formed allow greater manufacturing tolerances regarding the assembly of each stud and its associated stretcher. However, the ribs **20** are normally made slightly oversize so that they are deformed during assembly with the associated stretcher, thus providing a tight fit between stud and stretcher. In addition, the spaces **24** between the grooves **22** and the inside surface **26** of the stretcher are advantageously filled with an adhesive material **28**, preferably an epoxy resin, for securing the stud to the corresponding stretcher.

Upon joining all the stretchers **14** to the studs **12***a'* and **12***b'*, the frame of the table is extremely sturdy and rigid. Usually, the surfaces of all of the elements are coated with a paint or other suitable coating material to provide a desired color to the frame. The coating should be thick enough to fill and effectively conceal the joints between the several parts; e.g., joint **30** (FIG. 1) between the leg extension **12***b* and the associated stretcher **14** should not normally be noticeable. The coating is also desirable to prevent the metal of the frame elements from rusting or otherwise being deleteriously affected by moisture to which the furniture is normally subjected in outdoor use.

As noted above, the elliptical cross section of various of the elements is not absolutely necessary, and elements having other cross sections may be employed. However, an elliptical cross section such as shown for the stud **12***a'* in FIG. 5 provides maximum strength for supporting the stretcher, while minimizing the total material in all the elements of the frame, thereby reducing the weight and cost of the elements. The elliptical cross section for the stretchers is also generally aesthetically pleasing in appearance in structures of this type.

FIGS. 2 and 3 show the details of mounting the table top **16** within the frame of the table. In particular, each vertical leg **12** has secured thereto a lug **32**. As shown in FIG. 3 the lug **32** may be threaded at one end thereof, as at **34**, so that the lug end may be threaded into the leg **12**. The other end of the lug **32** includes a flange **36** which receives a screw **38** or other form of fastener for securing the table top **16** to the lug. As shown in FIG. 3 the table top **16** is formed from a plate **40** which advantageously may be of metal, and which includes a side edge **42** that extends downwardly and inwardly. Beneath the plate **40** is a stiff material **44**,

such as plastic foam material, which may add rigidity to the table top. The foam in this instance may be bonded to undersurface **46** of the table top, and the screw **38** may be threaded into the foam material to retain the table top **16** in place.

It will be noted that the table top is positioned within the frame formed by the stretchers **14** and the leg extensions **12***a* and **12***b*. The side edges **42** of the table top are spaced from the frame. By providing a downward and inward cant to the side edges **42**, not only is a pleasing appearance obtained in the table top construction but also the positioning of the table top within the frame is facilitated.

FIG. 4 shows an alternative form of connection between table frame and table top. In this case each vertical leg **12** is formed with an integral lug **32'** extending therefrom in the same fashion as the lug **32** shown in FIGS. 2 and 3. Table top **16'** is formed from a sheet **40'** of material, such as steel, which includes downwardly and inwardly extending side edge **42'** as well as a horizontal inward extension **47** that rests upon flange **36'** of the lug **32'**. Stiff material **44'** is positioned adjacent to the underside of the sheet **40'** to provide rigidity to the structure, and in this case is supported by a sheet **48** of protective material, such as steel. Bolt **38'** may be threaded into both the horizontal and inward extension **47** of the table top sheet **40'** as well as into the sheet **48** of protective material.

It should be noted that the invention described above involves a connection typically suited for an article of furniture. However, it should also be noted that the connection specifically shown in FIG. 5 is suitable for connecting other members not necessarily forming a part of a furniture article. For example, the stud with its ribs and associated grooves may be used to join any member to another member, such as a wheel to an axle wherein the axle is supported for rotation. This wheel and axle arrangement has not been illustrated since it is one of many possible forms of connection that may be made by the invention. The invention also involves an article of furniture.

Accordingly, the invention should be taken to be defined by the following claims.

I claim:

1. An article of furniture, comprising:

(a) a plurality of vertically extending furniture legs;

(b) each of said legs including a plurality of studs extending laterally toward adjacent legs;

(c) a plurality of ribs on an outside surface of each of said studs, each pair of adjacent ribs defining a groove therebetween;

(d) a plurality of stretchers each connecting together adjacent legs, said stretchers having tubular end portions positioned over said studs with an inside surface of each tubular end portion in contact with the ribs on the corresponding stud; and

(e) an adhesive material positioned in said grooves between adjacent ribs bonding together said studs and said tubular end portions.

2. A table, comprising:

(a) a plurality of vertically extending furniture legs;

(b) each of said legs including a plurality of studs extending laterally toward adjacent legs;

(c) a plurality of ribs on an outside surface of each of said studs, each pair of adjacent ribs defining a groove therebetween;

(d) a plurality of stretchers each connecting together adjacent legs, said stretchers having tubular end portions positioned over said studs with an inside surface of each tubular end portion in contact with the ribs on the corresponding stud;

(e) an adhesive material positioned in said grooves between adjacent ribs bonding together said studs and said tubular end portions;

(f) said stretchers and said furniture legs forming a frame for a table top;

(g) a table top enclosed by said frame and having side edges spaced from said frame that extend downwardly and inwardly; and

(h) a plurality of lugs extending inwardly from said frame supporting said table top within said frame.

3. A table as defined in claim **1**, wherein said lugs extend inwardly from and are attached to said vertically extending furniture legs.

References Cited by the Examiner

UNITED STATES PATENTS

595,126	12/1897	Merray et al.	108—13
1,760,036	5/1930	Bellows	108—153
2,040,126	5/1936	Grieve	20—92
2,533,831	12/1950	Molla	108—153 X
2,702,926	3/1955	Rahaim	20—92
2,729,279	1/1956	Axtell et al.	297—55
2,903,312	9/1959	Lawless	108—62
2,926,941	3/1960	Thompson	287—54
3,000,656	9/1961	Hollaender	287—2
3,074,203	1/1963	Paksy	287—2 X

FOREIGN PATENTS

121,224	2/1931	Austria.
1,329,026	5/1963	France.

References Cited by the Applicant

UNITED STATES PATENTS

Des. 31,157	7/1899	Stover.
Des. 167,146	7/1952	Homan.

OTHER REFERENCES

Knoll Associates, Inc., Catalog, p. 506.

FRANK B. SHERRY, *Primary Examiner.*

JAMES T. McCALL, *Examiner.*