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A COUPLING SYSYTEM

Field of Invention

The present invention relates generally to a coupling system for use in forming furniture assemblies.

Background

Furniture structures, for example book cases, storage cubes and stands, comprise manufactured furniture members that are sold in the assembled condition. However, a combination of various furniture structures are usually required for serving the furnishing needs of a particular premise or space. Conventional approach utilises common fasteners, for example screws, bolts and dowel pins, that often require pre-preparation prior to use. Tools for use with these fasteners and ample knowledge and skill for effectively utilising the tools are required for coupling the various furniture structures together. Further, the already inter-coupled furniture structures cannot be easily reconfigurable as tools are required for removable of the fasteners. In some instance, the removed fasteners cannot be effectively reused. This has contributed to the deterrence in updating furniture structure configurations and dampened the interest in self configuring of furniture assemblies formed from various furniture structures. Therefore, there is an apparent need for an improved approach for addressing the foregoing problems.

Summary

In accordance with a first aspect of the invention, there is disclosed a coupling system comprising a first coupling, a second coupling, a first article and a second article. The first coupling comprises an anchor segment and an attachment segment. The first article defines an aperture shaped and dimensioned for receiving the attachment segment of the first coupling therethrough. The anchor segment of the first coupling is shaped and dimensioned to abut the first article proximal the aperture thereof to thereby limit travel of the attachment segment of the first coupling through the aperture. The second coupling is coupled to the second article. When the first article is disposed adjacent the second article with the attachment segment of the first coupling being received through the aperture of the first article and being aligned with the second coupling, the attachment segment of the first

coupling is couplable to the second coupling to draw the anchor segment of the first coupling towards the second coupling to thereby couple the first article to the second article.

In accordance with a second aspect of the invention, there is disclosed a coupling system comprising a first coupling, a second coupling, a first article and a second article. Each of the first coupling and the second coupling comprises an anchor segment and an attachment segment. The first article defines an aperture shaped and dimensioned for receiving the attachment segment of the first coupling therethrough, the anchor segment of the first coupling being shaped and dimensioned to abut the first article proximal the aperture thereof to thereby limit travel of the attachment segment of the first coupling through the aperture. The second article defines an aperture shaped and dimensioned for receiving the attachment segment of the second coupling therethrough. The anchor segment of the second coupling is shaped and dimensioned to abut the second article proximal the aperture thereof to thereby limit travel of the attachment segment of the second coupling through the aperture. When the first article is disposed adjacent the second article with the attachment segment of the first coupling when received through the aperture of the first article being aligned with the attachment segment of the second coupling when received through the aperture of the second article, the attachment segment of the first coupling is couplable to the attachment segment of the second coupling to draw the anchor segment of the first coupling towards the anchor segment of the second coupling to thereby couple the first article to the second article.

In accordance with a third aspect of the invention, there is disclosed a coupling system comprising a first coupling, a second coupling, a furniture article and a padding structure. The first coupling comprises an anchor segment and an attachment segment. The furniture article defines an aperture shaped and dimensioned for receiving the attachment segment of the first coupling therethrough. The anchor segment of the first coupling is shaped and dimensioned to abut the furniture article proximal the aperture thereof to thereby limit travel of the attachment segment of the first coupling through the aperture. The second coupling is coupled to the padding structure. When the furniture article is disposed adjacent the padding structure with the attachment segment of the first coupling being received through the aperture of the furniture article and being aligned with the second coupling, the attachment segment of the first coupling is couplable to the second coupling to draw the anchor segment

of the first coupling towards the second coupling to thereby removably couple the padding structure to the furniture article.

Brief Description of the Drawings

FIG. 1 shows a system diagram of a coupling system comprising a first coupling, a second coupling, a first article and a second article according to an embodiment of the invention, the system diagram further mapping coupling interactions between constituents of the coupling system;

FIG. 2 shows a system diagram of the coupling system of FIG. 1 where the coupling system further comprises an adapter;

FIG. 3 shows an exploded side view of the coupling system of FIG. 2 with the first article being a low shelf and the second article being a partition structure;

FIG. 4 shows a partial rear perspective of the coupling system of FIG. 3 adapted to form a furniture assembly;

FIG. 5 shows an exploded partial front perspective of the coupling system of FIG. 2 with the first article adapted for coupling with two second articles, the first article being a corner shelf structure;

FIG. 6 shows an exploded partial front perspective of the coupling system of FIG. 2 with the second article being a padding structure while the first article being a shelf structure;

FIG. 7 shows an exploded partial front perspective of the coupling system of FIG. 2 with one of the first article being adapted to couple with three of the second article, the second article being a padding structure while the first article being a shelf structure;

FIG. 8 shows the coupling system of FIG. 7 assembled to form a furniture assembly;

FIG. 9 shows a partial plan view of the first coupling and the second coupling of FIG. 1 with the second coupling being adapted for a first coupling approach;

FIG. 10 shows a partial front perspective view of the first coupling and the second coupling of FIG. 9;

FIG. 11 shows a partial rear perspective view of the first coupling of FIG. 9 with a pair of protrusions;

FIG. 12 shows a partial plan view of the first coupling, the adapter and the second coupling of FIG. 2 with the second coupling being adapted for the first coupling approach of FIG. 10;

FIG. 13 shows a partial front perspective view of the first coupling, the adapter and the second coupling of FIG. 12;

FIG. 14 shows a partial plan view of the first coupling, the adapter and the second coupling of FIG. 2 with the second coupling being adapted for a second coupling approach; and

FIG. 15 shows a partial front perspective view of the first coupling, the adapter and the second coupling of FIG. 14.

Detailed Description

Reference will now be made in detail to an exemplary embodiment of the present invention, examples of which are illustrated in the accompanying drawings. While the invention will be described in conjunction with the embodiment, it will be understood that they are not intended to limit the invention to these embodiments. On the contrary, the invention is intended to cover alternatives, modifications and equivalents, which may be included within the spirit and scope of the invention as defined by the appended claims. Furthermore, in the following detailed description of embodiments of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be recognized by one of ordinary skill in the art that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, components, and circuits have not been described in detail as not to unnecessarily obscure aspects of the embodiments of the present invention.

An exemplary embodiment of the invention, a coupling system 20, is described with reference to FIGS 1 to 15. The coupling system 20 is preferably used for coupling furniture articles to form a furniture assembly 22. The coupling system 20 comprises a first coupling 24, a second coupling 26, a first article 28 and a second article 30. Preferably, the first coupling 24 comprises an anchor segment 32 and an attachment segment 34. The first article 28 defines an aperture 36 being shaped and dimensioned for receiving the attachment segment 34 of the first coupling 24 therethrough. The anchor segment 32 of the first coupling 24 is shaped and dimensioned to abut the first article 28 proximal the aperture 36 thereof to thereby limit travel of the attachment segment 34 of the first coupling 24 through the aperture 36. The second coupling 26 is coupled to the second article 30. When the first article 28 is disposed adjacent the second article 30 with the attachment segment 34 of the first coupling 24 being received through the aperture 36 of the first article 28 and being aligned with the second coupling 26, the attachment segment 34 of the first coupling 24 is couplable to the second coupling 26 to draw the anchor segment 32 of the first coupling 24 towards the second article 30 to thereby couple the first article 28 to the second article 30.

Preferably, the attachment segment 34 of the first coupling 24 is cylindrically shaped with the anchor segment 32 being shaped to function as a flange. The aperture 36 of the first article 28 is circular for shape matching the attachment segment 34 of the first coupling 24. The first article 28 is preferably a furniture article, for example, a cupboard, a shelf structure, a partition structure, a support structure, a display structure or a storage article or support article. The first article 28 preferably comprises a substantially planar segment where through the aperture 36 is defined. The substantially planar segment can constitute a side panel, a rear panel or any accessible panel of the first article 28 where to the second article 30 is to be coupled.

The attachment segment 34 of the first coupling 24 is tubular with a central bore. The aperture 36 of the first article 28 is dimensioned to accommodate the attachment segment 34 of the first coupling 24 therethrough with substantially minimal lateral free-play. The anchor segment 32 could adopt the shape of a planar circular disc or comprise a plurality of protrusions (not shown) to abut the first article 28 proximal the aperture 36. Alternatively, the anchor segment 32 of the first coupling 24 can be chamfered to enable the anchor segment 32 to substantially sit into a corresponding countersink formable in the first article 28. The anchor segment 32 and the attachment segment 34 of the first coupling 24 functions in tandem with the aperture 36 form in the first article 28 to enable removable coupling of the first coupling 24 with the first article 28. Further, coupling of the first coupling 24 to and decoupling of the first coupling 24 from the first article 28 can be performed by unassisted, for example by a user using his bare hands, without using any tools.

Preferably, the second coupling 26 comprises an anchor segment 38 and an attachment segment 40. In the coupling system 20, the second coupling 26 is coupled to the second article 30. The coupling system 20 provides two coupling approaches for coupling the second coupling 26 to the second article 30. In a first coupling approach, the second coupling 26 couples directly with the second article 30. In the first coupling approach, the second coupling 26 is coupled to the second article 30 via mechanical fasteners, glue. For example, the anchor segment 38 of the second coupling 26 can be flange shaped and defining a plurality of holes where through screws can be disposed for securing the second coupling 26 to the second article 30.

Alternatively, the second coupling 26 is formed with the second article 30 during production thereof. Therefore, the coupling between the second coupling 26 and the second article 30 in the first coupling approach is substantially permanent or require tools to assist in inter-coupling and decoupling of both thereof.

Similar to the first article 28, the second article 30 is preferably a furniture article, for example, a cupboard, a shelf structure, a partition structure, a support structure, a display structure or a storage article or support article. Alternatively, the second article 30 is a decorative structure, a padding structure, an interposer for supporting other objects, for example a television, white board or the like writing surface, a projection screen for coupling to the rear or sides of the first article 28, or a joint for coupling the first article 28 to another furniture article.

When the second article 30 is a padding structure, the padding structure comprises a padding material, a cover for substantially covering the padding material and a substrate for structurally supporting the padding material and the cover. The padding material is one of foam, elastomeric material or the like material with compressional dampening with cover being made from leather, synthetic leather or the like covering materials. The second coupling 26 then couples directly to the substrate with the substrate disposed between the padding material and the second coupling. The coupling system 20 enables different padding structures, having different padding materials or covers, to be removably coupled to the first article 24 allowing visual variability to the furniture assembly 22. The substrate is preferably made of wood. However, other materials that are substantially structurally rigid can be used for the substrate.

Preferably, the attachment segment 40 of the second coupling 26 is being shaped for nesting with the attachment segment 34 of the first coupling 24. The attachment segment 34 of the first coupling 24 removably couples with the attachment segment 40 of the second coupling 26 when nested therewith. The attachment segment 40 of the second coupling 26 is preferably cylindrically shaped.

The attachment segment 34 of the first coupling 24 defines a plurality of pathways 42. Each of the plurality of pathways 42 is preferably helically shaped. The attachment segment 40 of the second coupling 26 has a plurality of protrusions 44 shaped for engagement with the plurality of pathways 42.

When the attachment segment 34 of the first coupling 24 is positioned for nesting with the attachment 40 of the second coupling 26, the first coupling 24 is rotationally displaceable relative the second coupling 26 to draw the second coupling 26 towards the first coupling 25 during travel of the plurality of protrusions 44 from a first extremity towards a second extremity of each of the plurality of pathways 42. Should the attachment segment 34 of the first coupling 24 be shaped diametrically larger than the attachment segment 40 of the second coupling 26 for accommodating at least a portion of the attachment segment 40 therewithin when nested therewith, the plurality of protrusion 44 will extend outwardly away from the diametric centre of the attachment segment 40 of the second coupling 26. However, should the attachment segment 34 of the first coupling 24 be shaped diametrically smaller than the attachment segment 40 of the second coupling 26 for being accommodated by at least a portion of the attachment segment 40 when nested therewith, the plurality of protrusion 44 will extend inwardly towards the diametric centre of the attachment segment 40 of the second coupling 26.

It is preferred that each of the plurality of pathways 42 comprises a rest segment 46. The rest segment 46 of each of the plurality of pathways 42 is shaped for biasing the plurality of protrusions 44 towards the second extremity of each of the plurality of pathways to substantially impede unintended drawing of the plurality of protrusions 44 away from the rest segment 46 of each of the plurality of pathways 42 that will lead to decoupling of the first coupling 24 from the second coupling 26.

Based on the foregoing description, it will be apparent to a person skilled in the art that the plurality of pathways 42 be definable by the attachment segment 40 of the second coupling 26 with the plurality of protrusions 44 being formed on the attachment segment 34 of the first coupling 24.

Instead of directly coupling the first coupling 24 with the second coupling 26, the coupling system 20 can further comprise an adaptor 48 for inter-coupling the first coupling 24 and the second coupling 26.

The adaptor 48 has two end segments (not shown) whereto the attachment segment 34 of the first coupling 24 and the attachment segment 40 of the second coupling 26 are couplable. Each of the two end segments of the adaptor 48 is shaped and dimensioned for nesting and forming a concentric configuration with one of the attachment segment 34 of the first coupling 24 and the attachment segment 40 of the second coupling 26.

When the adaptor 48 is applied in the coupling system 20, each of the two end segments of the adaptor is further shaped for complementing the corresponding one of the attachment segment 34 of the first coupling 24 and the attachment segment 40 of the second coupling 26. For example, when the attachment segment 34 of the first coupling 24 is formed with the plurality of pathways 42, the corresponding one of the two end segments of the adaptor 48 will be formed with the plurality of protrusions.

In a second coupling approach, the second article 30 preferably comprises a substantially planar segment wherethrough an aperture 50 is defined. The substantially planar segment can constitute a side panel, a rear panel or any accessible panel of the second article 30. In the second coupling approach

the aperture 50 of the second article 30 is dimensioned to accommodate the attachment segment 40 of the second coupling 26 therethrough with substantially minimal lateral free-play. The anchor segment 38 adopts the shape of a planar circular disc or comprise a plurality of protrusions (not shown) to abut the second article 30 proximal the aperture 50. Alternatively, the anchor segment 38 of the first coupling 26 can be chamfered to enable the anchor segment 38 to substantially sit into a corresponding countersink formable in the second article 30.

Similar to the first coupling 24, the anchor segment 38 and the attachment segment 40 of the second coupling 26 functions in tandem with the aperture 50 formed in the second article 30

to enable removable coupling of the second coupling 26 with the second article 30. Further, coupling of the second coupling 26 to and decoupling of the second coupling 26 from the second article 30 can be performed by unassisted, for example by a user using his bare hands, without using any tools. Further, the coupling system 20 also enables the first coupling 24 to be coupled to and decoupled from the second coupling unassisted and without the use of tools.

When applied to the furniture assembly 22, a plurality of each of the first coupling 24 and the second coupling 26 may be used. As such, a plurality of the apertures 36 are to be formed in the first article 28 to correspond with at least the quantity of the plurality of the first couplings 26 to be used. Should the second coupling approach be taken, a plurality of the apertures 50 are also to be formed in the second article 30 for corresponding with at least the quantity of the plurality of the second couplings 26 to be used.

A multiplicity of the apertures 36/50 may be pre-formed in each of the first article 28 and the second article 30. However, not all of the apertures 36/50 need be used for assembling the furniture assembly 22. The apertures 36/50 formed in each of the corresponding one of the first article 28 and the second article 30 is preferably arranged in a rectilinear matrix with equal and consistent horizontal spacing and vertical spacing. This enable any combination of the apertures 36 formed in the first article 28 to spatially align with any combination of the apertures 50 formed in the second article 30. Not all the apertures 36/50 need be used for assembling the furniture assembly 22. The unused portion of the apertures 36/50 can be presented for decorative purposes.

In a forgoing manner, a coupling system is described according to an exemplary embodiment of the invention. Although only one embodiment of the invention is disclosed in this document, it will be apparent to one skilled in the art in view of this disclosure that numerous changes and/or modifications can be made to the disclosed embodiment without departing from the scope and spirit of the invention.

Claims

1. A coupling system comprising:
 - a first coupling comprising an anchor segment and an attachment segment;
 - a first article defining an aperture shaped and dimensioned for receiving the attachment segment of the first coupling therethrough, the anchor segment of the first coupling being shaped and dimensioned to abut the first article proximal the aperture thereof to thereby limit travel of the attachment segment of the first coupling through the aperture;
 - a second article; and
 - a second coupling coupled to the second article,
 wherein when the first article is disposed adjacent the second article with the attachment segment of the first coupling being received through the aperture of the first article and being aligned with the second coupling, the attachment segment of the first coupling is couplable to the second coupling to draw the anchor segment of the first coupling towards the second coupling to thereby couple the first article to the second article.
2. The coupling system as in claim 1, the attachment segment of the first coupling being cylindrically shaped and the anchor segment being a flange.
3. The coupling system as in claim 2, the attachment segment being tubular in shape.
4. The coupling system as in claim 2, the second coupling comprising:
 - an anchor segment being couplable with the second article and
 - an attachment segment being shaped for nesting with the attachment segment of the first coupling, the attachment segment of the first coupling removably couples with the attachment segment of the second coupling when nested therewith.
5. The coupling system as in claim 4, further comprising:
 - an adapter being shaped and dimensioned for nesting with the attachment segment of each of the first coupling and the second coupling and for coupling the first coupling to the second coupling.

6. The coupling system as in claim 5, the adapter being cylindrically shaped for concentric arrangement with the attachment segment of each of the first coupling and the second coupling when attached therewith.
7. The coupling system as in claim 1, one of the attachment segment of the first coupling and the second coupling defining a plurality of pathways and the other of the attachment segment of the first coupling and the second coupling having a plurality of protrusions shaped for engagement with the plurality of pathways to draw the first coupling towards the second coupling during passage of the plurality of protrusions from a first extremity towards a second extremity of each of the plurality of pathways.
8. The coupling system as in claim 7, a portion of each of the plurality of pathways being shaped for biasing the plurality of protrusions towards the second extremity of each of the plurality of pathways when the first coupling is being drawn away from the second coupling.
9. The coupling system as in claim 1, the first article and the second article being furniture articles.
10. The coupling system as in claim 1, at least one of the first article and the second article being a cupboard, a shelving unit, a cabinet, a decorative structure, a white board and a screen.
11. A coupling system comprising:
 - a first coupling;
 - a second coupling, each of the first coupling and the second coupling comprising an anchor segment and an attachment segment;
 - a first article defining an aperture shaped and dimensioned for receiving the attachment segment of the first coupling therethrough, the anchor segment of the first coupling being shaped and dimensioned to abut the first article proximal the aperture

thereof to thereby limit travel of the attachment segment of the first coupling through the aperture; and

a second article defining an aperture shaped and dimensioned for receiving the attachment segment of the second coupling therethrough, the anchor segment of the second coupling being shaped and dimensioned to abut the second article proximal the aperture thereof to thereby limit travel of the attachment segment of the second coupling through the aperture,

wherein when the first article is disposed adjacent the second article with the attachment segment of the first coupling when received through the aperture of the first article being aligned with the attachment segment of the second coupling when received through the aperture of the second article, the attachment segment of the first coupling is couplable to the attachment segment of the second coupling to draw the anchor segment of the first coupling towards the anchor segment of the second coupling to thereby couple the first article to the second article.

12. The coupling system as in claim 11, the attachment segment of each of the first coupling and the second coupling being cylindrically shaped and the anchor segment of each of the first coupling and the second coupling being a flange.
13. The coupling system as in claim 12, the attachment segment of each of the first coupling and the second coupling being tubular in shape.
14. The coupling system as in claim 12, further comprising:
an adapter being shaped and dimensioned for nesting with the attachment segment of each of the first coupling and the second coupling and for coupling the first coupling to the second coupling.
15. The coupling system as in claim 14, the adapter being cylindrically shaped for concentric arrangement with the attachment segment of each of the first coupling and the second coupling when attached therewith.

16. The coupling system as in claim 11, one of the attachment segment of the first coupling and the adapter defining a plurality of pathways and the other of the attachment segment of the first coupling and adapter having a plurality of protrusions shaped for engagement with the plurality of pathways to draw the adapter towards the anchor segment of the first coupling during passage of the plurality of protrusions from a first extremity towards a second extremity of each of the plurality of pathways.
17. The coupling system as in claim 16, a portion of each of the plurality of pathways being shaped for biasing the plurality of protrusions towards the second extremity of each of the plurality of pathways when the adapter is being drawn away from the anchor segment of the first coupling.
18. The coupling system as in claim 11, the first article and the second articles being furniture articles.
19. The coupling system as in claim 11, at least one of the first article and the second article being a cupboard, a shelving unit, a cabinet, a decorative structure, a white board and a screen.
20. A coupling system comprising:
 - a first coupling comprising an anchor segment and an attachment segment;
 - a furniture article defining an aperture shaped and dimensioned for receiving the attachment segment of the first coupling therethrough, the anchor segment of the first coupling being shaped and dimensioned to abut the furniture article proximal the aperture thereof to thereby limit travel of the attachment segment of the first coupling through the aperture;
 - a padding structure; and
 - a second coupling coupled to the padding structure,wherein when the furniture article is disposed adjacent the padding structure with the attachment segment of the first coupling being received through the aperture of the furniture article and being aligned with the second coupling, the attachment segment of the first coupling is couplable to the second coupling to draw the anchor

segment of the first coupling towards the second coupling to thereby removably couple the padding structure to the furniture article.

21. The coupling system as in claim 20, the padding structure comprising:
 - a padding material;
 - a cover for substantially covering the padding material; and
 - a substrate for structurally supporting the padding material and the cover, the second coupling being coupled to the substrate.
22. The coupling system as in claim 21, the padding material being foam and the cover being one of leather and fabric.
23. A furniture configuration system comprising:
 - a first coupling comprising an anchor segment and an attachment segment;
 - a first furniture article comprising a planar segment, the planar segment defining an aperture shaped and dimensioned for receiving the attachment segment of the first coupling therethrough, the anchor segment of the first coupling being shaped and dimensioned to abut the planar segment of the first furniture article proximal the aperture thereof to thereby limit travel of the attachment segment of the first coupling through the aperture;
 - a second furniture article; and
 - a second coupling coupled to the second article,wherein when the first furniture article is disposed adjacent the second article with the attachment segment of the first coupling being received through the aperture of the planar segment of the first article and being aligned with the second coupling, the attachment segment of the first coupling is couplable to the second coupling to draw the anchor segment of the first coupling towards the second article to thereby couple the first article to the second article.