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[54] **VALET RACK POST**  
**6 Claims, 6 Drawing Figs.**

[52] U.S. Cl. .... **287/103,**  
**285/397**

[51] Int. Cl. .... **E21d 15/06**

[50] Field of Search .....

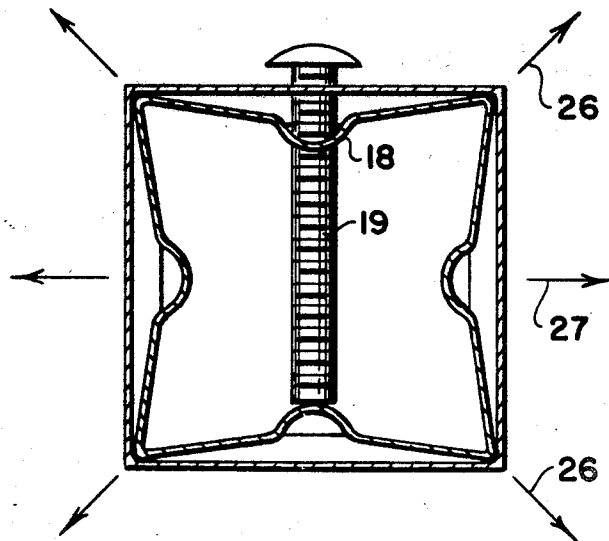
287/58,  
 58CT, 54C, 54B, 54A, 104; 24/(Inquired);  
 287/103; 285/397, 302

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**ABSTRACT:** A two piece post for valet racks and the like having a tubular connection wherein a reduced end portion of one tubular member is provided with longitudinal grooves with the grooved portion being inserted into a second tubular member and a bolt threaded through one side of the joined-tubular members to fasten the members together and to expand the grooved faces into engagement with the outer tubular member.



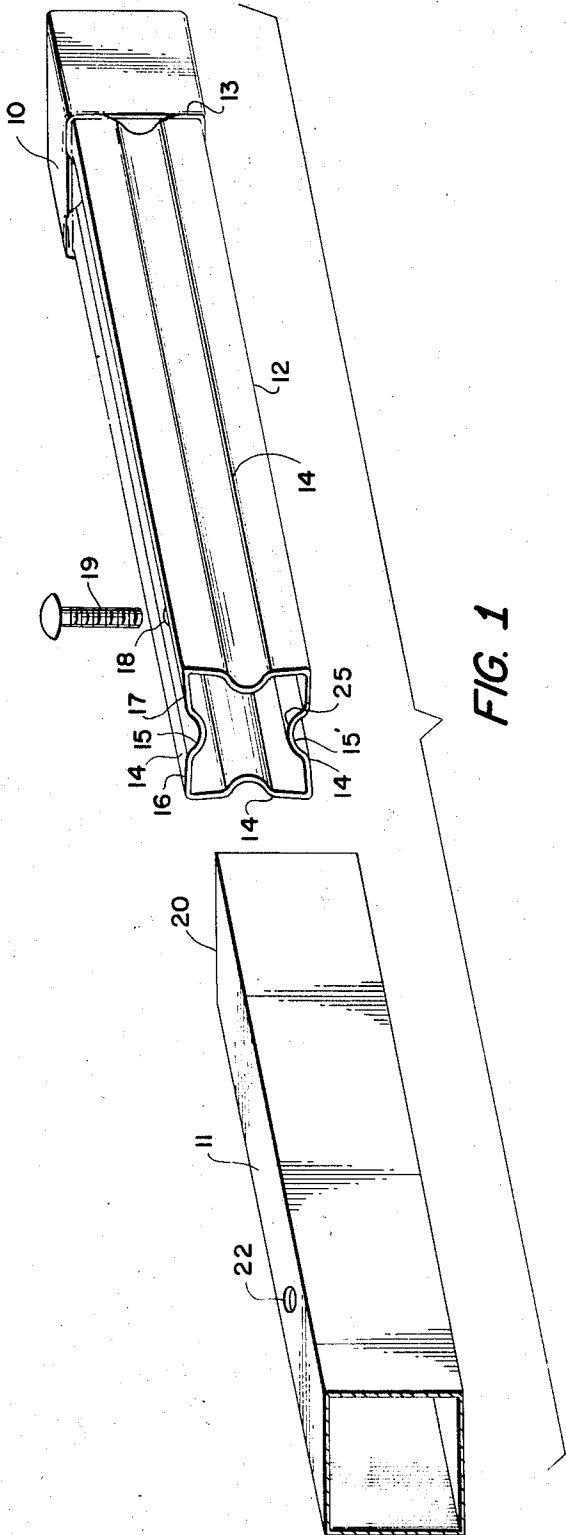


FIG. 1

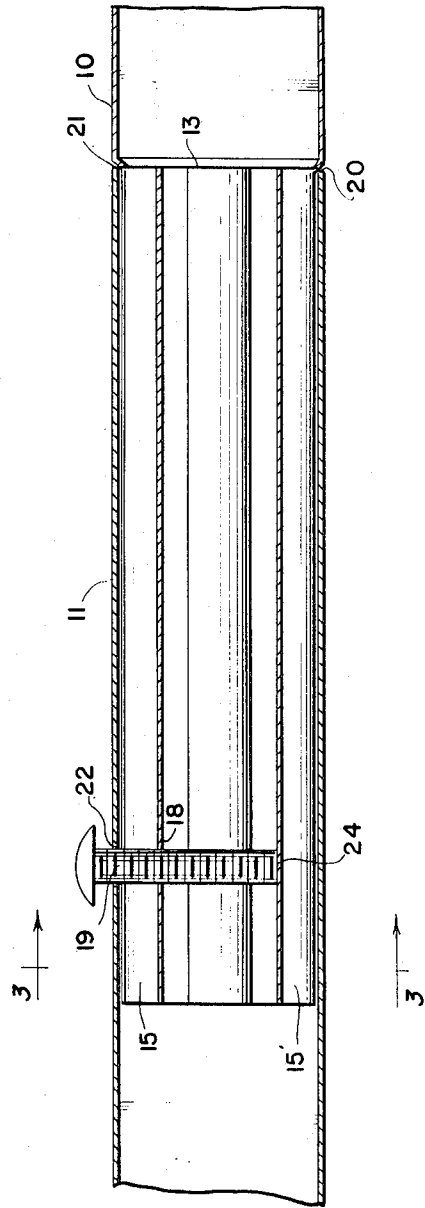


FIG. 2

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FIG. 3

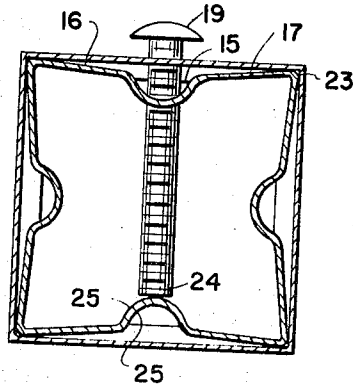


FIG. 4

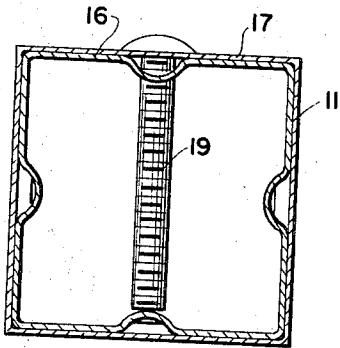


FIG. 5

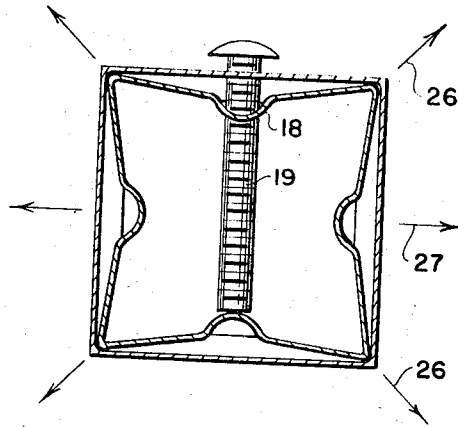
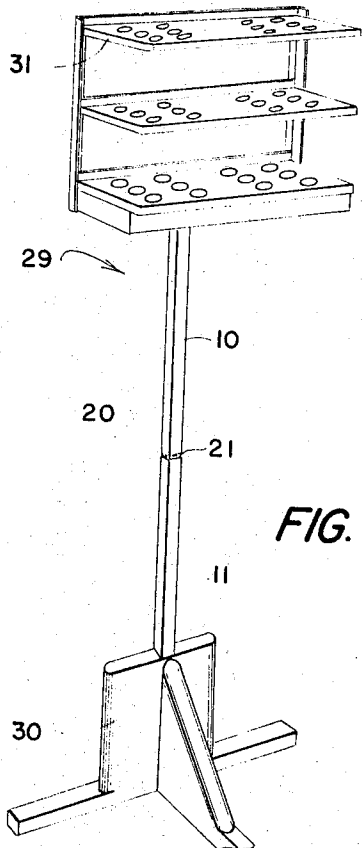


FIG. 6



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## VALET RACK POST

The present invention relates to a two piece post for a clothes rack or the like, more particularly, to a tubular connection by which the two pieces can be quickly assembled into a rigid post having a uniform exterior surface.

A widely used form of a hat and coat rack basically includes a vertical post upstanding from a base with a shelf and/or hook section on the upper portion of the post. These racks are generally shipped and stored in the disassembled condition with the base, post and shelf sections being packaged separately. The upright post is generally formed of a hollow tubular member and may have a length of 5-6 feet. While the base and shelf sections form relatively small and compact packages for shipment and storage, the post is rather awkward and presents difficulties because of its length. As a result, numerous attempts have been made to devise a post which could be disassembled into two or more pieces with the pieces being shipped in a package and then assembled at the site to form a rigid unitary post structure. The various forms of connections proposed for joining the post pieces have been unsatisfactory since the connections are either too complicated or do not firmly join the individual pieces. The resulting assembled post is thus considerably weakened than if the post were made in a single piece and is not rigid so that the assembled rack is susceptible to considerable amounts of movement during use. The further disadvantage of such connections is that a significant amount of the connecting structure protrudes exteriorly of the assembled post. This not only detracts from the appearance of the post when used in clothes racks, furniture and the like, but may present a source of injury to persons or damage to clothing.

It is therefore the principal object of the present invention to provide a novel and improved connection for two tubular members.

It is another object of the present invention to provide a socket connection for tubular members wherein the inner member is urged into engagement with the socket by a structure accessible exteriorly of the connection.

It is a further object of the present invention to provide a two piece tubular post which can be easily and quickly connected to form a single rigid tubular member.

It is an additional object of the present invention to provide an effective and rigid connection between two similar tubular members with the exterior surfaces adjacent the connection being flush and free from protuberances.

The tubular connection according to the present invention is particularly adapted for two piece posts or other forms of structural members such as may be found in racks of various kinds, shelving, articles of furniture, structural members and other applications. The tubular connection disclosed herein attains all of the above-mentioned objects and, in addition, avoids the disadvantages of the prior art, some of which have been mentioned above.

The present invention may comprise a vertical upright tubular post which is in two pieces. The post has a square cross section with a wall of a substantially uniform thickness. One member of the two piece post has a reduced cross section at one end with there being a plurality of longitudinally extending grooves in the faces thereof. At the end of the grooved portion there is an annular shoulder having a height substantially equal to the thickness of the wall of the tubular post. The grooved portion is slip-fitted into the second tubular piece and may be snugly received therein. A bolt is then passed through an opening in the outer tubular member and threaded into a tapped opening in one of the grooves. As the bolt is threaded into the tubular connection, the end of the bolt will engage the opposed groove. Continued threading of the bolt will expand the tapped groove and opposed groove in opposite directions into frictional engagement with the corresponding inner surfaces of the outer tubular member. At the same time, the other two grooved faces will also be urged outwardly into engagement with the outer tubular member. The result is a rigid immovable firm connection with the only evidence of the con-

nection being a thin line where the outer tubular member meets the shoulder at the end of the reduced cross section. The head of the bolt may extend above the surface of the outer tubular member but in the case of a rack may be positioned against a wall so that the bolt is invisible to people using the rack.

Other objects and advantages of the present invention will be apparent upon reference to the accompanying description when taken in conjunction with the following drawings wherein;

FIG. 1 is an overall perspective view of the tubular members which form the joint and shown in the disassembled position;

FIG. 2 is a longitudinal section view of the assembled tubular members shown in FIG. 1;

FIG. 3 is a transverse sectional view taken along the line 3-3 of FIG. 2 and showing the relationship of the tubular members before the bolt is tightened;

FIG. 4 is a view similar to that of FIG. 3 and showing the expansion of the inner tubular member upon tightening of the bolt;

FIG. 5 is a view similar to that of FIG. 3 but showing schematically the forces exerted when the bolt is tightened; and

FIG. 6 is an overall perspective view of a hat and coat rack incorporating the tubular connection of the present invention in the vertical post.

Proceeding next to the drawings wherein like reference symbols indicate the same parts throughout the various views a specific embodiment and modifications of the present invention will be described in detail.

In FIG. 1 there are illustrated tubular members 10 and 11 which are interconnected to form a single tubular member. The tubular members are relatively thin walled, rolled steel tubes having a square cross section. The connection according to the present invention can be used with other shaped cross sections including various forms of polygons and with circular tubing.

The tubular member 10 has one end thereof reduced in cross section by means of a mandril and die and this reduced cross section portion is indicated at 12. A shoulder 13 is formed at the end of the reduced section portion and has a height which is substantially equal to the thickness of the wall of the tubular members. The reduced cross section portion 12 has four faces 14 with each face being provided with a longitudinally extending groove or flute 15. The groove 15 extends from the end of the reduced cross section portion to the shoulder 13 where, as may be seen in FIG. 1, the bottom of the groove extends below the shoulder. The formation of the groove 15 thus forms two surfaces 16 and 17 in each face. These faces 16 and 17 are inclined downwardly toward the groove as shown in FIG. 3. In addition, the entire reduced cross section portion 12 has a slight taper therein from the shoulder 13 to its extreme end with the taper being on the order of several thousandths of an inch.

One of the grooves 15 is provided with a tapped hole 18 threaded to receive a bolt 19 in a manner to be presently described.

The taper on the reduced cross section portion enables this grooved portion of tubular member 10 to be slip-fitted into the tubular member 11 into the position as shown in FIG. 2. The end 20 of tubular member 11 will abut against the shoulder 13 of tubular member 10 in the manner as shown in FIG. 2 so that the only evidence of the joint or connection is a thin line 21 as shown in the assembled rack of FIG. 6.

Tubular member 11 is provided with an opening 22 which registers with tapped opening 18 when the two tubular members have been fitted into the position as shown in FIG. 2.

When the bolt 19 is inserted through opening 22 and tapped opening 18, the connected tubular members are locked against relative axial and rotative movement. In order to lock further the tubular members so as to provide a rigid immovable connection the bolt 19 is threaded downwardly until its head reaches the upper surface of tubular member 11. When the tubular members are first connected together, the grooves

15 and inclined surfaces 16 and 17 of the reduced cross section portion will have the appearance such as illustrated in FIG. 3. It will be seen that the corners 23 of the reduced cross section portion will be slightly spaced from the corresponding corners of tubular member 11 and the surfaces 16 and 17 will be inclined slightly away from the inner surface of tubular member 11. Thus, when the end 24 of the bolt 19 first contacts the rib 25 formed by the groove 15' opposed from tapped hole 18, the surfaces of the reduced cross section portion will have the appearance as illustrated. The length of the bolt 19 is so selected that when the bolt is threaded its entire distance into the position as shown in FIG. 4, the inclined surfaces 16 and 17 will have been drawn into frictional engagement with the interior surfaces of the outer tubular member 11. As the bolt 19 is threaded downwardly, the corners of the reduced cross section portion will move outwardly in the directions as indicated by the schematic diagram in FIG. 5 and by the arrows 26 therein. At the same time, the outward movement of the corners in the direction shown by the arrows 26 will cause the inclined surfaces 16 and 17 to move radially outwardly in the direction shown by the arrows 27. It will be apparent that as the bolt 19 is threaded, its end will urge groove 15' outwardly and at the same time the forces exerted by the screw threads against tapped hole 18 will also urge groove 15 outwardly and in the opposite direction from opposed groove 15'. Thus the ultimate relative positions of the tubular members will be as illustrated in FIG. 4 when the bolt has been threaded downwardly as far as it will go. The result will be a closely fitted locked tubular connection.

It will be apparent that when the reduced cross section portion 12 is formed with a die and mandril, the excess metal resulting from the reduced cross section is taken up by the longitudinal flutes or grooves 15. While the reduced cross section portion and the grooves may be formed in any other suitable process, it is pointed out that the use of a die and mandril has produced particularly satisfactory results.

The connected tubular members 10 and 11 might be used, for example, for forming the vertical post 28 employed in the coat and hat rack indicated generally at 29 and shown in FIG. 6. This rack comprises a base 30 with the post 28 upstanding therefrom and supporting a shelf section 31 on its upper end.

While the specific embodiment of the present invention has been described as utilizing a square tubular member, it is apparent that other polygonal tubular members may be so connected. In addition, the concept of the present invention may be employed with a tubular member having a substantially circular or elliptical cross section. It will be apparent from the schematic force diagram of FIG. 5 that the use of square tubular members is particularly satisfactory because of the forces exerted by the tightening of the fastening screw or bolt 19.

Because of the relationship between the reduced cross section portion 12, and the remaining portion of tubular member 10, it will be seen that the connection of the tubular members 10 and 11 will form a smooth exterior surface in the vicinity of the joint or seam 21. The fastening screw 19 may be provided with a round head and be relatively flat so as to present only a very slight projection above the exterior surface of the connected tubular members.

Thus it can be seen that the present invention provides a

simple yet effective socket connection for tubular members wherein the inner tubular member is expanded into engagement with the socket tubular member by means of a fastening screw threaded into the connection from the exterior thereof.

The action of the fastening screw upon the grooves formed in the inner tubular member will expand the grooved portion into intimate engagement with the socket tubular member to provide a rigid and slipfree fit. The tubular members according to the present invention are readily assembled into a rigid post merely by inserting the grooved portion into the socket portion and tightening the fastening screw. While the present invention is particularly adapted for use in a two piece post for racks and the like the connection is susceptible of numerous other applications where it is desired to interconnect two tubular members.

It will be understood that the present invention is susceptible to modification in order to adapt it to different usages and conditions and, accordingly, it is desired to comprehend such modification within this invention as may fall within the scope of the appended claims.

I claim:

1. In a tubular connection, first and second tubular members having similar square cross sections, said first tubular member having an end portion of reduced cross section, there being a longitudinally extending groove in each face of the reduced cross section end portion, said second tubular member having an internal cross section at one end thereof conforming to the peripheral outline of said grooved end portion so that the grooved end can be telescopically received within the second tubular member one end, and means operable exteriorly of said second tubular member for interconnecting said tubular members in telescopic relationship and for expanding the corners of the grooved end portion outwardly into engagement with the inner surfaces of the corresponding corners of said second tubular member so that the tubular members are connected firmly together.

2. In a tubular connection as claimed in claim 1 wherein each grooved face is inclined inwardly toward the groove therein.

3. In a tubular connection as claimed in claim 1 wherein an annular shoulder is in said first tubular member at the end of said reduced cross section portion, the height of said shoulder being substantially equal to the thickness of the wall of the second tubular member so that the exterior surfaces of the tubular members will be flush when the tubular members are connected in telescopic relationship.

4. In a tubular connection as claimed in claim 1 wherein said expanding means act outwardly against the inner surfaces of opposed grooves.

5. In a tubular connection as claimed in claim 1 wherein said means comprises a bolt passing through said second tubular member and a groove in said first tubular member, the end of said bolt engaging the groove opposed from said first mentioned groove.

6. In a tubular connection as claimed in claim 5 with said bolt being threaded in said first mentioned groove so that screwing the bolt inwardly will urge said first mentioned groove and said opposed groove outwardly against said second tubular member.

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