United States Patent

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[72] Inventor **Gilbert J. Holtz**
182 Tibbets Road, Yonkers, N.Y. 10705

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[54] **CLOSET ACCESSORY CONSTRUCTION**
2 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** **211/177,** 211/182
[51] **Int. Cl.** **A47f 5/00**
[50] **Field of Search** ..... 211/177, 182, 148; 287/54 C

[56] **References Cited**

UNITED STATES PATENTS

3,187,693	6/1965	Hamilton et al.	211/148 X
850,658	4/1907	Koonce	211/182 X
1,645,980	10/1927	Bearly	287/54 C X
2,529,008	11/1950	Flory	287/54 C X
2,844,396	7/1958	Krokos et al.	287/54 C
3,176,848	4/1965	Stefan	211/177 X

Primary Examiner—Ramon S. Britts
Attorney—Darby & Darby

ABSTRACT: A closet accessory in the form of a hat, coat and shoe rack of the type transportable in a disassembled condition, including a number of hollow tubing structural members and with T-joints, between base members and upright members for example, of particularly simple and rugged construction formed by flattening an end portion of a hollow tube, curving it to conform to the curve of a tube to which it is to be joined, bending off the partially flattened and unflattened portions of the first tube at approximately right-angles to the round flat portion, and providing in the bend ridges with a curvature opposite to the bend. The flattened and formed tubing section described above is fastened, by spot welding for example, to the second piece of tubing which it is shaped to conform with to form a strong T-shaped tubing structure.

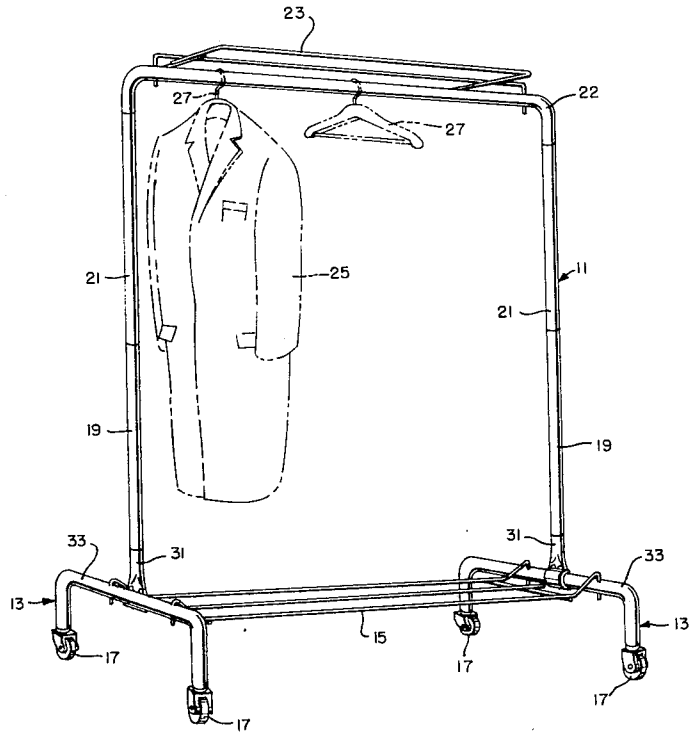


FIG. 1

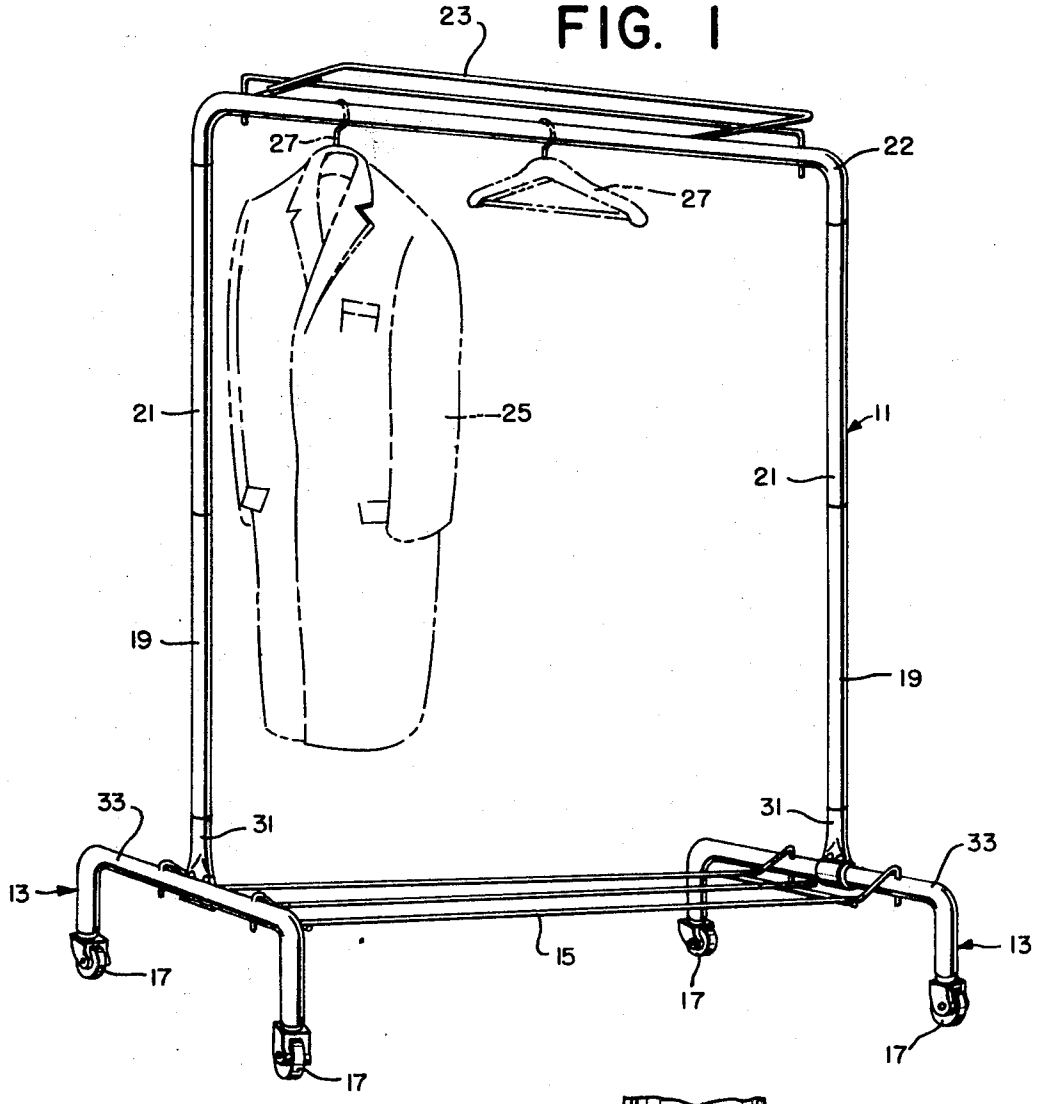


FIG. 2

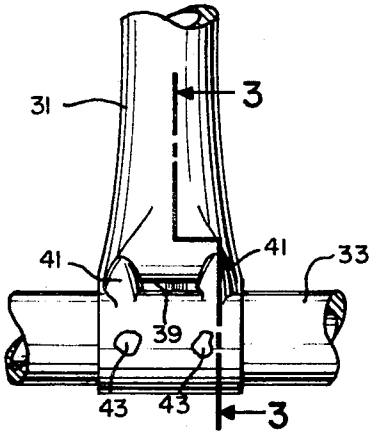
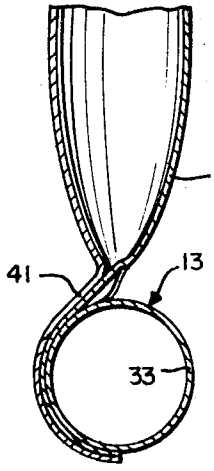


FIG. 3



INVENTOR
GILBERT J. HOLTZ

BY Darby & Darby
ATTORNEYS

CLOSET ACCESSORY CONSTRUCTION

The storage of clothing items in a closet or other storage area is facilitated by various known forms of closet accessories such as hatracks, shoe racks, etc. which are conveniently formed of strong but light tubing elements which may be chrome plated or otherwise decoratively finished.

Particularly in the case of larger accessories such as coat racks it is desirable to design the coatrack of a number of tubing elements which can be transported in a disassembled condition and which by virtue of enlarged and/or diminished end portions are assembled together readily to form a relatively large structure approximately 5 feet tall by several feet in length without the use of special tools or similar hardware such as nuts and bolts.

The tubing elements of which such a structure is to be formed can be readily bent to L-shapes, U-shapes or the like while preserving rigidity and strength of the element to the necessary degree. In forming T-shaped elements as is required in such structures (for example to join an upright portion to a horizontal base portion) it becomes necessary to secure one piece of tubing to another piece of tubing at substantially a right-angle with strength and rigidity yet without an unacceptable increase in the fabrication cost of the otherwise simple structure.

Previous closet accessory structures of the type here involved have included T-shaped junctions between hollow tubing formed simply by spot welding the sidewall of one section of tubing to the sidewall of another section of tubing, with the tubing sections arranged at right-angles. While quite simple, this construction does not provide adequate strength or rigidity, particularly in view of the fact that the T-junction of such structures is frequently a location subjected to relatively large forces and stresses developed in normal handling of the assembled construction.

The present invention provides a closet accessory structure including a T-junction for pieces of tubing which is simple and inexpensive but nonetheless rigid and rugged to a sufficient degree to withstand the forces and stresses encountered by the structure in normal use with virtually no incidence of failure.

The T-shaped tubing junction includes a flattened tubing portion bent to the curvature of the joining section of tubing, a substantially right-angle bend between the curved flattened portion and the partially flattened and unflattened portion of the bent-tubing section, and a pair of ridges spaced along the substantially right-angle bend having a curvature opposite to that of the bend providing rigidity at the area of the bend. A pair of spot welds is also preferably utilized to secure the two-tubing sections together forming the T-junction.

It is an object of the present invention to provide a closet accessory structure including a particularly simple, inexpensive, yet rugged T-joint between tubing sections of which the structure is to be assembled.

It is another object of the present invention to provide tubing elements including a portion formed of a "T" wherein by partially flattening and forming bends of reverse curvature in portions of the tubing structure a particularly strong and rugged joint is achieved in a relatively inexpensively fabricated structure.

Other objects and advantages in addition to those described and suggested above will be apparent from a consideration of the following description in conjunction with the appended drawings in which:

FIG. 1 is a perspective view of a representative closet accessory in the form of a combined hat, coat, and shoe rack incorporating the present invention;

FIG. 2 is a fragmentary elevational view of a tubing element T-junction structure representing an important feature of the present invention; and

FIG. 3 is a vertical sectional view taken along the line 3—3 in FIG. 2.

Referring to FIG. 1, a closet accessory 11 is shown in the form of a combined hat, coat, and shoe rack.

The accessory 11 is formed of a number of structural elements most of which are in the form of tubing sections appropriately shaped and dimensioned to be assembled into the completed structure.

It is highly advantageous for articles such as the illustrated closet accessory to be transported to the location where it is to be used in a disassembled condition thereby permitting a rather large structure to be transported in a container of a volume of about 1 cubic foot or less. Shipping in disassembled form carries with it the disadvantage of requiring the user or purchaser to assemble the structure and it is therefore highly desirable that the assembly be simplified the maximum extent possible as by eliminating all small hardware such as nuts or bolts, which tend to become lost, require special tools or lead to improper assembly. The closet accessory 11 has both the advantage of being capable of being transported in disassembled condition and of requiring no hardware or special tools in assembly.

The closest accessory 11 includes a pair of U-shaped base elements 13 formed of steel tubing. Elements 13 support, and are constrained by, a wire grid shoe rack 15.

Shoe rack 15 may be secured relative to U-shaped elements 13 by the simple expedient of having bent ends of the wire grid arranged to slide into vertical holes in the top of U-shaped elements 13 as shown in FIG. 1.

Closet accessory 11 is preferably provided with conventional casters 17 press-fit into the ends of the arms of U-shaped members 13. Closet accessory 11 accordingly can be rolled from place to place if desired. Alternatively, casters 17 could be omitted or replaced by plastic glides.

The upright portions of closet accessory 11 are formed of straight tubular elements 19 and 21. The lower ends of tubular elements 19 are reduced in diameter to fit into the open end of the upwardly extending sections of U-shaped base elements 13. The upper ends of tubing elements 19 are enlarged to accept in a similar fashion the reduced end of tubing elements 21. It is convenient for each tubing element 21 to be reduced in diameter at both ends and for a top tubing element 22 to have enlarged downward opening ends engaging the tops of tubing elements 21.

A hatrack 23 formed of a wire grid is provided and may be conveniently located on top of top element 22 by providing top element 22 with vertical holes to accept downwardly bent wire portions of hat rack 23.

As illustrated in FIG. 1, hangers 27 together with garments 25 are conveniently stored on the closet accessory 11.

The upwardly extending portion 31 of U-shaped base members 13 should be secured in position relative to U-shaped base members 13 ruggedly and rigidly since this junction of the structure encounters much of the force and stress in normal use of the structure.

It is an important feature of the present invention to provide a T-shaped junction between upright portion 31 and the center of U-shaped base element 13 which is simple and inexpensive to fabricate and yet provides a high degree of rigidity and ruggedness. The construction of the T-shaped junction between the upright portion 31 and the horizontal portion 33 of the U-shaped elements 13 is shown in greater detail in FIGS. 2 and 3. It will be noted that a forming operation is carried out on tubing element 31 while (except for forming into U-shape) tubing element 33 is not deformed to provide the desired junction.

The forming operation on tubing element 31 is preferably carried out in a conventional manner in a single stroke in a power press with dies suitably formed in accordance with known die-making techniques. For convenience, however, the various portions of the deformed tubing element 31 will be described separately.

The end of tubing element 31 is substantially completely flattened and bent in the form of a portion of a cylinder conforming to the outside diameter of tubing element 33.

The partially flattened and the unflattened portion of tubing element 31 is bent relative to the flattened and cylindrically curved portion at approximately a 90° angle. The flattened and cylindrically bent portion preferably forms approximately a half cylinder.

It is important that the T-junction not be weak with respect to bending along the bend line **39**, and accordingly ridges **41** are formed near the ends of bend line **39** with a curvature which is opposite to that of the bend at bend line **39**. In other words, in FIG. **2** the bend at bend line **39** is concave whereas the bend-forming ridges **41** is convex.

Tubing section **31** may be secured to the horizontal tubing portion **33** by spot welding as indicated at **43**. Improved rigidity is provided by spot welding and two-spaced locations but this is not in all cases essential. It will be noted that the conformity between the shape of the flattened cylindrically bent portion of tubing elements **31** and the outside diameter of tubing portion **33** lends considerable rigidity to the T-junction and it is primarily the function of the spaced welds **43** to hold the walls of the respective tubing sections together rather than to resist any twisting or sheer stress at the point of the spot welds. Obviously, the spot weld connections **43** could be replaced by other conventional means such as rivets or the like, but spot welding is the preferred construction.

From the foregoing description it will be seen that a closet accessory is provided having a construction including a T-shaped junction which is located at a point of substantial force and stress in normal use of the closet accessory and is particularly rigid and rugged while at the same time simple and easy to fabricate.

It will be apparent that modifications and variations to the forms of the invention described or suggested may be devised by those skilled in the art and it is accordingly desired that the scope of the invention not be considered to be limited to the particular structure shown or suggested.

What is claimed is:

1. A closet accessory comprising, a pair of inverted U-shaped metal tubular elements of circular cross section, said U-shaped tubular elements each having joined thereto an upwardly extending tubular section, a pair of upright tubular elements engaging respectively said upright tubular sections, a top tubular crosspiece joining said upright tubular sections and a bottom crosspiece joining said inverted U-shaped tubular elements, the joinder of each said U-shaped tubular element and the corresponding upwardly extending tubular section consisting of a T-shaped junction constructed at the center of said U-shaped metal tubular elements between a first and a second of such tubular elements, the first of said tubular elements being substantially undeformed in the area of the junction and the second of such tubular elements being flattened at its end, the flattened portion thereof being bent in the shape of a sector of a cylinder subtending at least 50° and not more than about 200° to conform to the cross-sectional shape of said first tubular element, there being a partially flattened portion of said second tubular element adjacent said flattened portion and a bend of approximately 90° between said flattened portion and said partially flattened portion portion, the bend line of said bend being along a line approximately parallel to the axis of said cylinder, there further being at least one ridge bent in said second tubular element across said bend line, said ridge having a curvature opposite to that of the bend at said bend line, and a total length substantially less than the length of said flattened portion, the flattened portion of said upwardly extending tubular section being secured to the wall of said U-shaped tubular element near the center thereof and said T-shaped junction substantially supporting said closet accessory structure.

2. A closet accessory comprising a pair of inverted U-shaped metal tubular elements of circular cross section, said U-shaped elements each having joined thereto an upwardly extending tubular section, a pair of upright tubular elements engaging respectively said upright tubular sections, a top tubular crosspiece joining said upright tubular sections and a bottom crosspiece joining said inverted U-shaped tubular elements, the joinder of each of said U-shaped tubular elements and the corresponding upwardly extending tubular section consisting of a T-shaped junction constructed at the center of said U-shaped metal tubular elements between a first and second of such tubular elements, the first of said tubular elements being substantially undeformed in the area of the junction and the second of such tubular elements being flattened at its end, the flattened portion thereof being bent in the shape of a sector of a cylinder subtending at least 50° and not more than about 200° to conform to the cross-sectional shape of said first tubular element, there being a partially flattened portion of said second tubular element adjacent said flattened portion, and a bend of approximately 90°between said flattened portion and said partially flattened portion, the bend line of said bend being along the line approximately parallel to the axis of said cylinder, said second tubular element further having a portion opposite said flattened end of circular cross section less than half its total length but more than 1 inch in length, there further being at least one ridge bent in said second tubular element across said bend line, said ridge having a curvature opposite to that of the bend at said bend line and a total length substantially less than the length of said flattened portion, the flattened portion of said upwardly extending tubular section being secured to the wall of said U-shaped tubular element near the center thereof and said T-shaped junction substantially supporting said closet accessory structure.

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