

SPACE FRAME ROD

BACKGROUND OF THE INVENTION

This invention relates to a space frame rod,
5 particularly to one increased in strength and convenient
to process and combine with ball joints to form a space
frame.

As shown in Fig. 4 and 5, a conventional space
frame is assembled with a preset number of rods 10 and
10 preset number of ball joints 20. Each rod 10 consists of a
tube member 11, two conical heads 12, two bolts 13 and
two sleeves 14. The tube member 11 is made of a hollow
metal tube, having a mouth 111 respectively at two ends
for a coupling section 121 of a conical head 12 to fit
15 firmly therein. Then the contact annular line of the
mouth 111 and the coupling section 121 are welded
together to form an annular projection 123, which is then
ground flat and smooth and coated with a layer of
anti-rust paint to assemble the conical head 12 with the
20 tube member 11 as integral. After that one of the two
bolts 13 is inserted through one end of the tube member
12 to extend out, and the other of the two bolts 13 is
inserted through the other end of the tube member 12 to
extend out. Then each of the two sleeves 14 is
25 respectively fitted around the shank of each bolt 13. The
shank of each bolt 13 has a slide groove 131 for a pin 141
to fit therein. After the rod 10 is finished in assembling,

then the sleeve 14 can be rotated with the bolt 13 so as to screw the bolt 13 with a threaded hole 21 of a ball joint 20 to form a part of a space frame 1.

However, the space frame 1 can constitute an extremely large striding space without using vertical posts for supporting a space frame 1, usable space may be 100 % of the space formed by the space frame. Therefore, every rod 10 should be strong enough to secure safety because of no posts used in a space frame 1. But the rod 10 used in the conventional space frame 1 has the tube member 11 welded together with the two conical heads 12, and the conical heads 12 are often increased in thickness of its wall to heighten its support force, subsequently increasing the weight of the rod 10, which makes a burden to the space frame 1. At the same time, the conical head 12 and the tube member 11 have to be fitted together very accurately, or an accuracy error may happen after they are assembled together, resulting in disqualified products. Moreover, the welded projection 123 may not effectively controlled in its quality, and if the projection 123 may contain air holes or miscellaneous matters, inferior strength of a rod 10 may happen, and besides, the projection 123 has to be ground flat and smooth to complicate processes. If the projection 123 should be ground not properly to form uneven thickness, then it may affect assembled strength.

SUMMARY OF THE INVENTION

The purpose of the invention is to offer a space frame rod made of a metal tube and having a conical member formed respectively in two ends, and each conical member is combined with a sleeve and a head of a bolt is inserted in the conical member, with the sleeve fitting round a part of the shank of the bolt so that the shank of the bolt may be threadably combined with a ball joint so as to form a part of a space frame.

BRIEF DESCRIPTION OF DRAWINGS

This invention will be better understood by referring to the accompanying drawings, wherein:

Figure 1 is an upper view of a part of a space frame having a space frame rod in the present invention;

Figure 2 is an exploded perspective view of the space frame rod in the present invention;

Figure 3 is a cross-sectional view of the space frame rod assembled with a ball joint in the present invention;

Figure 4 is an exploded perspective view of a part of a conventional space frame; and,

Figure 5 is a cross-sectional view of the conventional space frame rod assembled with a ball joint.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of a space frame rod in the present invention, as shown in Fig. 1, includes a rod 30

to be assembled with a ball joint 30 so as to form a part of a space frame 10. The rod 30 consists of a tube member 31, two bolt 32 and two sleeves 33.

5 The tube 31 is made of a hollow metal tube, having a conical member 311 formed respectively at two ends. Each conical member 311 has a small-diameter section 312 with an inner hole 313 and an annular end 314 extending out from the small-diameter section 312.

Each bolt 32 is combined with the conical member 10 312 of the tube member 31, having a head 321 and a shank of a preset length, and a slide groove 322 formed in an outer surface of the shank. The head 321 has a stepped conical annular surface to fit firmly in the inner hole 313 of the small-diameter section 312 of the tube 15 member 31

The sleeve 33 fits around a part of the shank of the bolt 32, having a pinhole in its wall for a pin 331 to insert through to extend in the slide groove 321 of the bolt 32. Further, the sleeve 33 has an inner annular wall 20 332 formed in one end to fit around the annular end 314 of the tube member 31, and an annular curved wall 333 formed in the other end to fit with a partial curved surface of a ball joint 30. The curvature of the annular curved wall 333 is the same as that of the ball joint 30 so 25 as to contact with each other very closely.

The ball joint 40 is used to connect with the rods 30 to form a part of the space frame 1, having a threaded

hole 41 for the threaded end of the bolt 32 to screw with.

Next, how the rod 30 is assembled with a ball joint 40 is be described. As shown in Figs. 2 and 3, the rod 30 is aligned to the threaded hole 41 of the ball joint 40, and the sleeve 33 together with the bolt 33 is screwed in the threaded hole 41 until the annular curved wall 333 completely contacts with the outer surface of the ball joint 40. Under this condition, the bolt 32 is screwed tightly with the ball joint 40, with the head 321 contacting tightly the small-diameter section 312 of the conical member 311 of the tube member 31. As the distance between the tube member 31 and the ball joint 40 shortens, the sleeve 33 has its inner annular wall 332 naturally fitting around the small-diameter section 312 and the annular end 314 to gradually tighten the small-diameter section 312 and the annular end 314 against the bolt 32 as the sleeve 33 is screwed further and further.

In forming a space frame 1 with the rods 30 and the ball joints, the rods 30 have a comparatively good strength without need of grinding flat and smooth the conical member 311 of the tube 30, as they are formed integral without welding process. Therefore, there arise no flaws caused by welding. It is evident that the rods 30 can be assembled securely and strongly with the ball joints 40 and the space frame 1 may be stabilized in its structure, because the sleeve 33 moves the bolt 32 to

combine with the tube member 31, the curved surface 333 tightly contacts the surface of the ball joint 40, and the inner annular wall 332 completely contacts the small-diameter section 312 and the annular end 314 .

5 Lastly, it is worthy to mention that the rods 31 are formed integral with metal tubes, not as the conventional space frame rods are to be welded and ground, saving time and cost not a little. And the sleeve 33 and the bolt 32 are combined tightly and securely by means of the
10 head 321 contacting tightly the conical member 311 of the tube 30 and the small-diameter section 312 and the annular end 314.

 While the preferred embodiment of the invention has been described above, it will be recognized and
15 understood that various modifications may be made therein and the appended claims are intended to cover all the modifications that may fall within the spirit and scope of the invention.



I CLAIM

1. A space frame rod comprising a rod and two bolts and two sleeves, said rod made of a metal tube, said bolt extending out of each end of said rod and
5 having a part of its shank fitted around by said sleeve, said sleeve capable to rotate said bolt to screw in a boll joint of a space frame; and

Characterized by said rod made of a metal tube and having a conical member formed respectively at
10 two end portions and tapering towards the end, said conical member having a small-diameter section near each end and an inner hole, said bolts inserted in advance in said rod and extending out respective of two ends of said rod, each said bolt having a head
15 located in said conical member and contacting tightly against an inner wall of said conical member, each said bolt having a shank extending out said rod.

2. The space frame rod as claimed in Claim 1, wherein said rod has two annular ends respectively
20 connected to each said conical member and having a preset length, and said sleeve has an inner annular wall to correspond to each said conical member and each said annular end.

3. The space frame rod as claimed in Claim 1, wherein each said bolt has its head formed with a
25 stepped conical surface to tightly contact said conical member and an inner wall of said rod.



4. The space frame rod as claimed in Claim 1, wherein each said sleeve has an inner curved surface in one end to tightly contact the surface of said ball joint.

5