

PATENT SPECIFICATION

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(54) STUDDED CHAIN LINK

(71) We, BERGVIK OCH ALA AB, a Swedish joint stock company, of Kyrkogatan 16, S-826 01 Soderhamn, Sweden, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a studded chain wherein a so called stud is inserted between the side bars of each chain link and secured thereto only by pressing the sides of the links towards the ends of said stud, said ends having a concave configuration in a plane perpendicular to the longitudinal direction of the link.

Chains comprising such studded chain links are preferably used as anchor chains for ships, oil drilling rigs, loading bouys and the like, and very strict requirements are called for as to the strength of the chain. The links are made from cross-cut round steel bars which are heated and bent into a hooked engagement with the finished chain. Then, the plain cutting surfaces of the steel bars are joined in a flash welding machine, after which the stud is inserted just opposite to the joint and pressed into engagement with the side bars of the link. The link is then heat-treated and proof-tested.

A previously known stud of the kind referred to hereinbefore is disclosed in the Swedish patent specification 168 492 (see also the journal, "Ny Teknik", No. 8, 1975, p.1, 8 and 9). The ends of the stud are provided with wart-like protrusions adapted to facilitate the centering and fixing of the stud to the link. A support weld is applied around the end edges of the stud at the sides of the link thereby to further enhance the fixing of the stud and to prevent crevice corrosion, which is a requirement when the chain is to be used for anchoring oil drilling rigs for example.

Since such a welding operation is to a great extent carried out manually, the total time for producing such link chains is increased. It has been found that the support weld in some instances gives rise to undesired weakening of the strength of the link.

The principle object of the present invention is to provide an improved studded chain link so constructed that the need for a support weld is eliminated.

According to the present invention there is provided a studded chain link comprising a stud inserted between the round cross-sectional side bars of a link and fixed thereto by pressing the sides of the link against the ends of the stud, the end surfaces of the stud which engage the side bars each being of concave configuration in a plane perpendicular to the longitudinal direction of the link, and each being of concave configuration entirely also in a longitudinal plane of the link.

Preferably, the radius of curvature of the concave end surfaces of the stud in said perpendicular plane is smaller than the radius of the side bars of the chain link.

Furthermore, by forming the end surfaces of the stud and the sides of the link comparatively long relative to the diameter of the link, minimum deformation of the link is obtained when the stud is pressed into the link, whereby the material is utilized in a more satisfactory manner as far as strength is concerned. Owing to this the joint of the link is also relieved from tensile and compressive stresses after the stud has been pressed into the link.

The accompanying drawing and the following description will further illustrate an embodiment of the present invention.

In the drawing:

Fig. 1 illustrates a studded chain link according to the present invention;

Fig. 2 is a cross sectional view of the

link and illustrates a phase in the stud insertion operation where the sides of the link and the end edges of the stud have just come into engagement with each other; and

Fig. 3 is a cross sectional view taken along the line III-III in Fig. 1 wherein the stud is pressed into the link.

In Fig. 1 a finished chain link 1 is shown having a stud 2 pressed into the sides of the link. The link 1 is produced from a round cross-sectional steel bar bent back at both ends and joined end to end by flash welding just opposite to the stud 2. The stud 2 has concave end surfaces 3 (see Fig. 1) in a longitudinal plane of the link 1 so as to firmly engage and secure the stud 2 to the side bars of the link. The end surfaces of the stud are also concave in a transverse plane perpendicular to the longitudinal plane of the link as shown by 4 in Fig. 2.

Fig. 2 illustrates a stage in the manufacturing operation where the side bars of the link have been pressed towards one another to an extent such that they just come into engagement with the side edges of the stud 2. It should be noted that the radius of curvature of the end surfaces 4 of the stud 2 in the transverse plane is smaller than the radius of the side bars. Owing to the fact that the end surfaces of the stud are concave in two mutually perpendicular planes, when the stud is fully pressed into the side bars of the link to achieve the Fig. 3 configuration a remarkably effective sealing or fitting is obtained between the stud 2 and the link 1 which favourably prevents creation of crevice corrosion.

As is readily apparent from a consideration of the drawing, the ratio between the length of the engaging surface at each end of the stud and the diameter of the side bars of the link is about 1:0.75.

By thus forming the support surface at each end of the stud comparatively long

relative to the diameter of the link, a reduced deformation of the link is obtained when the stud is pressed into the link (Fig. 3) and when the chain is heavily loaded with the result that the flash welded joint of the link does not receive any additional stresses. Thanks to the firm fixing of the stud and the good fitting of the contacting stud and link surfaces, the need for additional support welding is eliminated whereby the time required for manufacturing of the studded chain is shortened.

WHAT WE CLAIM IS:—

1. A studded chain link comprising a stud inserted between the round cross-sectional side bars of a link and fixed thereto by pressing the sides of the link against the ends of the stud, the end surfaces of the stud which engage the side bars each being of concave configuration in a plane perpendicular to the longitudinal direction of the link, and each being of concave configuration entirely also in a longitudinal plane of the link.

2. A studded chain link as claimed in claim 1, in which the radius of curvature of the concave end surfaces of the stud in said perpendicular plane is smaller than the radius of the side bars of the chain link.

3. A studded chain link as claimed in claim 1 or 2, in which the ratio between the length of the engaging surface at each end of the stud and the diameter of the side bars of the link is about 1:0.75.

4. A studded chain link substantially as hereinbefore described and shown in the accompanying drawing.

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2. A studded chain link as claimed in claim 1, in which the radius of curvature of the concave end surfaces of the stud in said perpendicular plane is smaller than the radius of the side bars of the chain link.

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