$~1 (Original)

* **IN THE HIGH COURT OF DELHI AT NEW DELHI**

\+ C.A.(COMM.IPD-PAT) 5/2021

ART SCREW CO., LTD. ..... Appellant

Through: Mr. Ranjan Narula and Mr. S. Pandey, Advs.

versus

THE ASSISTANT CONTROLLER OF PATENTS AND DESIGNS ..... Respondent

Through: Mr. Harish Vaidyanathan Shankar, CGSC, Mr. Srish Kumar Mishra, Mr. Sagar Mehlawat, Mr. Alexander Mathai Paikaday, Advs.

CORAM:
HON'BLE MR. JUSTICE C.HARI SHANKAR

JUDGMENT (O R A L)

% 14.12.2022

1. This appeal under Section 117(A) of the Patents Act, 1999, at the instance of the appellant Art Screw Company Ltd. is directed against order dated 8th June 2021 passed by the learned Assistant Controller of Patents & Designs in the Patent Office, whereby Patent Application No. 6541/DELNP/2011, filed by the appellant for registration of a patent in respect of an invention titled "Fastener and Fastening Structure" has been denied on the ground that, in the light of prior art in the form of Patents No. DE10308130Al, W02008081721, US6394726Bl and US7207248B2, the invention claimed by the petitioner in the patent application filed by the petitioner lacked any inventive step within the meaning of Section 2(1)(ja)[1] of the Patents Act, 1970.

[1] "inventive step" means a feature of an invention that involves technical advance as compared to the existing

2. Mr. Narula, learned Counsel for the petitioner commenced his submission by explaining that the invention in respect of which was aimed, basically, at curing the problem faced while tightening nuts into bolts in a fastener where, if the nut was tightened beyond a point, it tends to become loose or even break. He also showed the Court a video clip, which sought to demonstrate that the aforesaid problem was overcome in the invention of the petitioner by a peculiar configuration and construction of the screw threads on the bolt.

3. Mr. Narula refers me to the following paras from the complete specifications in the suit patent:

> [0009] In the case where a male thread and a female thread are to be hot-dip galvanized, it is necessary to cut a larger portion of the female thread than normally (that is, "overtap" the female thread) in order to prevent the male thread and the female thread from becoming unable to fit each other due to the thickness of the plating.
>
> Normally, an overtap of about 0.40 mm to about 0.80 mm is provided for an M10 thread. When such overtap is applied to the male thread structures according to Patent Japanese Utility Model Application Publication No. JP-U-Sho 53-88664 and Japanese Patent Application Publication No. JP-A-Hei 8-177839, the gap between the flank surface of the male thread and the flank surface of the female thread is increased, as a result of which the friction force between the flank surface of the male thread and the flank surface of the female thread may be significantly reduced or may not be obtained at all. Therefore, it is very difficult to apply thick plating such as hot-dip galvanizing to the male thread structures according to Japanese Utility Model Application Publication No. JP-U-Sho 53-88664 and Japanese Patent Application Publication No. JP-A-Hei 8-177839 while maintaining the loosening prevention effect.
>
> [0010] The present invention has been made to solve the foregoing problems, and therefore has at least one of the following objects.
>
> (1) To provide a fastening member or a

knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art

fastening structure that yields a significant loosening prevention effect.

(2) To provide a fastening member or a fastening structure that can be tightened in the same way as a normal bolt to facilitate torque management, and that can be reused easily.

(3) To provide a fastening member or a fastening structure with improved fatigue strength achieved by equalizing the load imposed on all screw threads of the fastening member to prevent stress concentration.

(4) To provide a fastening member or a fastening structure that prevents occurrence of initial loosening.

(5) To provide a fastening member or a fastening structure to which thick plating can be applied while maintaining the loosening prevention effect.

Means for Solving the Problem

[0011] In order to achieve at least one of the above objects, the present invention provides a fastening member as follows.

That is, the present invention provides a fastening member having a thread structure, including an upper portion provided on a side of a thread crest, and a lower portion provided on a side of a thread root, in which a pressure flank surface formed in the upper portion is provided on a side of a seat surface with respect to a pressure flank surface of a basic profile, and at least one side surface of the lower portion is provided inwardly of an extension line of a corresponding flank surface.

Effects of the Invention

[0012] In the fastening member according to the present invention, the pressure flank surface formed in the upper portion provided on the side of the thread crest is provided on the side of the seat surface with respect to the pressure flank surface of the basic profile. Therefore, when the fastening member is fastened to a mating fastening member, the pressure flank surface is pressed by the mating fastening member.

A side surface of the lower portion of the screw thread

of the fastening member is located inwardly of the corresponding flank surface, and shaped to be dented inward. Thus, the lower portion of the screw thread is elastically deformed by the above pressing, which generates a reaction force (spring-back) against the pressure flank surface of the mating fastening member in the entire screw thread.

Accordingly, the friction force between the pressure flank surface of the fastening member and the pressure flank surface of the mating fastening member is increased, which demonstrates a significant loosening prevention effect.

[0013] The pressure flank surface of the fastening member is pressed by the mating fastening member, which elastically deforms the lower portion of the screw thread. Therefore, the entire screw thread rises up along the mating fastening member.

Accordingly, the pressure flank surface of the fastening member and the pressure flank surface of the mating fastening member necessarily contact each other even if overtap is provided. Therefore, a reaction force (spring-back) against the mating fastening member is generated in the screw thread irrespective of the size of the gap between the fastening member and the mating fastening member, which demonstrates a loosening prevention effect.

Thus, the loosening prevention effect is not reduced even if overtap is provided in the mating fastening member for the fastening member according to the present invention, and therefore thick plating can be performed on the fastening member according to the present invention while maintaining the loosening prevention effect.

[0014] Further, in the fastening member according to the present invention, the friction force on the seat surface of the fastening member is also increased by the reaction force (spring-back) of the screw thread.

This prevents initial loosening due to wear or deformation of the seat surface, and in turn prevents a breakage of the fastening member due to the initial loosening, which improves the reliability. The absence of initial loosening eliminates the need for additional tightening, which improves the workability.

[0015] When the fastening member according to the present invention is brought back from the fastened state to the unfastened state, the entire screw thread is brought back to the state before fastening (a state in which the pressure flank surface is positioned on the side of the seat surface with respect to the pressure flank surface of the basic profile).

> This allows repeated use of the fastening member according to the present invention without the need for a special treatment.
>
> When the fastening member according to the present invention is fastened, the lower portion of the screw thread is elastically deformed. Therefore, the mating fastening member is unlikely to be damaged, and the loosening prevention effect is not reduced even after repeated use.

4. Mr. Narula thereafter pointed out that the reasoning in the impugned order dated 8th June 2021, for rejecting the suit patent, is largely incomprehensible. He has pointed out that, of the 15 pages which comprise the impugned order, pages 1 to 13 merely set out the disclosures contained in the alleged prior art DE10308130Al, W02008081721, US6394726Bl and US7207248B2, whereafter the reasoning of the learned Assistant Controller is confined to the following two paragraphs:

> "16. Therefore, it would have been obvious to the person skilled in art to combine and impart the technical features of D2 and Dl such as thread of a fastening member includes an upper portion, a space portion, and a lower portion, a bulging portion that bulges outward from the reference surface and bulges from the crest of the screw thread to the lower edge of the upper portion, the lower edge vicinity region of the upper portion is gently curved so as to approach the reference surface 10a, and has an R shape. The space portion is a space formed in the direction from the lower edge to the peak portion, lower portion is formed below the space portion, side surface of the lower portion is located on the inner side of the reference surface, has an R shape that curves toward the inner side of the reference surface, and gently curves so as to be continuous with the wall surface of the space portion, angle of the thread valley between adjacent threads is about 145°, angle of the crest of the screw thread is about 70°, while the angle θ 2 formed by the reference surface 1 is 60°, non-fastened state, the bulging portion of the screw thread bulges outward from the reference surface 1, a longitudinal section of the unfastened thread, thread flanks are straight, being through the thread flanks straight lines a V -shaped profile segment define, area of the top of the V-shaped

profile segment is this with the material, in particular aluminum, from which the fastener is completed thread flanks extending outside the V-shaped profile segment lying lateral curvature areas or fillet sections, A tangent T through the thread root runs parallel to the thread axis, section near the thread base points at the bottom of the thread a radius of curvature, which corresponds to approximately 20% of the pitch , a central base section adjoining area has a radius of curvature which is smaller than the radius of curvature on the thread base, thread profile describes in a partial area each outer curvature area a radial section or area with technical features of D3 and D4 such as first pressure flank angle is preferably between approximately 5 degrees and approximately 10 degrees, and in one application is approximately 7 degrees, second pressure flank angle is preferably between approximately 10 degrees and approximately 30 degrees, and in one application is approximately 15 degrees, threaded screw fastener is disclosed at, while a radius of the threaded screw fastener, angular extent or inclination of the radially outer forward flank surface with respect to the radius is designated by means of the angle, angular extent or inclination of the radially inner forward flank surface with respect to the radius is designated by means of the angle to have technical features of the present invention as thread crest and a pressure flank surface formed in said upper portion are closer to a seat surface than a pressure flank surface of a basic profile of said fastening member corresponding to said basic profile of said mating fastening member, at least one side surface of said lower portion is provided inwardly of an extension line said thread crest and said pressure flank surface of said fastening member are formed such that, when said fastening member is tightened into said mating fastening member.

17. Considering documents Dl: DE10308130Al; D2: W02008081721 ; D3: US6394726Bl and D4: US7207248B2 in combination, present application for patent lacks of in inventive step still stands as the applicant fails to persuade the same. Features of current amended claims are not inventive over cited documents as above and are not an invention u/s 2(1) (ja) of the Act."

5. Para 16 of the impugned order is completely incomprehensible. Mr. Vaidyanathan, learned Counsel for the respondent also confesses that he is not in a position to explain the reasoning contained in the impugned order.

6. An order which contains reasons that no one can understand is

worse than an unreasoned order. From the impugned order, the basis for holding that the invention of the petitioner is lacking in an inventive step is impossible to comprehend.

7. A finding that an invention for which a patent is sought, lacks in inventive step is a serious finding. It compromises, seriously, even the inventive integrity of the applicant-inventor. The assessment of whether, in inventing the invention, any inventive steps was involved, has to be examined after taking into account a variety of factors in respect of which there are several authoritative pronouncements, including many of the Supreme Court.

8. The Court is not satisfied that the impugned order reflects proper application of mind to the issue or is supported by comprehensible reasons on which it can stand.

9. Learned Counsel for the parties are agreeable *ad idem* to this matter being disposed of by setting aside the impugned order and remanding the matter to the learned Assistant Controller of Patents to re-consider the matter and pass a fresh order which is properly reasoned and comprehensible at least to a person skilled in the art.

10. The learned Assistant Controller would also afford an opportunity to hearing both sides before taking a decision on the applications.

11. For the said purpose, the petitioner would present himself before the learned Assistant Controller on 27th December 2022.

12. In order to obviate the possibility of any apprehension of pre-determination, it would be advisable as the matter is placed before an officer other than the officer who has passed the impugned order. Mr. Vaidyanathan undertakes to make all efforts in that regard.

13. The learned Assistant Controller is directed to take a decision in the matter as expeditiously as possible and, in any event, within a period of three months from today. All issues of fact and law are kept open to be urged before the learned Assistant Controller.

14. The petition stands allowed to the aforesaid extent with no order as to costs.

C.HARI SHANKAR, J

DECEMBER 14, 2022/AR