SUMMARY

[0009] Herein disclosed is a method of joining tubular length of oil country tubular casing or piping involves the steps of: utilizing a first tubular member having an associated pin member with a first thread structure and a first helical torque shoulder spaced axially along the pin member from the first thread structure; utilizing a second tubular member having an associated box member with a second thread structure and a second helical torque shoulder spaced axially along the box member from the second thread structure; engaging the pin member and box member with each other into a stab position that is defined by interaction of the first thread structure and the second thread structure, in the stab position the first helical torque shoulder does not contact or axially overlap with the second helical torque shoulder; rotating at least one of the first tubular member or the second tubular member such that interaction between the first thread structure and the second thread structure guides the first helical torque shoulder into cooperating alignment with the second helical torque shoulder.

[0009a] The method may further include continuing rotation of at least one of the first tubular member or the second tubular member until the first helical torque shoulder fully engages with the second helical torque shoulder.

[0010] Herein disclosed is a tubular connection includes a pin member and a box member. The pin member has a first thread structure and a helical torque shoulder spaced axially along the pin member from the first thread structure.. The box member has a second thread structure and a second helical torque shoulder spaced axially along the box member from the second thread structure. The first thread structure and the second thread structure are sized and located to control a stab position of the tubular connection, and in the stab position the first helical torque shoulder does not engage or axially overlap with the second helical torque shoulder.

[0010a] Herein disclosed is a tubular connection, comprising: a pin member having: a first tapered constant pitch thread having a root, a crest, a stab flank and a load flank; a first helical torque shoulder surface spaced axially along the pin member from the first tapered constant pitch thread, the first helical torque shoulder surface is non-tapered; a box member having: a second tapered constant pitch thread having a root, a crest, a stab flank and a load flank; a second helical torque shoulder surface spaced axially along the box member from the second tapered constant pitch thread, the second helical torque shoulder surface is non-tapered; the pin member and the box member configured such that in the stab position the first helical torque shoulder surface does not engage or overlap with the second helical torque shoulder surface.

[0010b] In one aspect, there is provided a tubular connection, comprising: a pin member having: a first tapered constant pitch thread having a root, a crest, a stab flank and a load flank; a first variable pitch helical torque shoulder surface spaced axially along the pin member from the first tapered constant pitch

thread, the first variable helical torque shoulder surface is non-tapered; a box member having: a second tapered constant pitch thread having a root, a crest, a stab flank and a load flank; a second variable pitch helical torque shoulder surface spaced axially along the box member from the second tapered constant pitch thread, the second variable pitch helical torque shoulder surface is non-tapered; the pin member and the box member configured such that in the stab position the first variable pitch helical torque shoulder surface does not engage or overlap with the second variable pitch helical torque shoulder surface.

[0010c] In another aspect, there is provided a tubular connection, comprising: a pin member having: a first thread structure; a first variable pitch helical torque shoulder spaced axially along the pin member from the first thread structure; a box member having: a second thread structure; a second variable pitch helical torque shoulder spaced axially along the box member from the second thread structure; wherein the first thread structure and the second thread structure are sized and located to control a stab position of the tubular connection, in the stab position the first variable pitch helical torque shoulder thread does not engage or overlap with the second variable pitch helical torque shoulder.

[0010d] In a further aspect, there is provided a method of joining tubular length of oil country tubular casing or piping, the method comprising: utilizing a first tubular member having an associated pin member with a first tapered constant pitch thread structure and a first non-tapered variable pitch helical torque shoulder spaced axially along the pin member from the first thread structure; utilizing a second tubular member having an associated box member with a second tapered constant pitch thread structure and a second non-tapered variable pitch helical torque shoulder spaced axially along the box member from the second thread structure; engaging the pin member and box member with each other into a stab position that is defined by interaction of the first thread structure and the second thread structure, in the stab position the first variable pitch helical torque shoulder does not contact or axially overlap with the second variable pitch helical torque shoulder; rotating at least one of the first tubular member or the second tubular member such that interaction between the first thread structure and the second thread structure guides the first non-tapered variable pitch helical torque shoulder into cooperating alignment with the second non-tapered variable pitch helical torque shoulder.

[0010e] In yet another aspect, there is provided a tubular connection, comprising: a pin member having: a first tapered constant pitch thread structure; a first variable pitch helical torque shoulder surface spaced axially along the pin member from the first thread structure, wherein the first variable pitch helical torque shoulder is non-tapered; a box member having: a second tapered constant pitch thread structure; a second variable pitch helical torque shoulder surface spaced axially along the box member from the second hread structure, wherein the second variable pitch helical torque shoulder is non-tapered; wherein the first thread structure and the second thread structure are sized and located to control a stab position of the tubular connection, in the stab position the first variable pitch helical torque shoulder surface does not engage or overlap with the second variable pitch helical torque shoulder surface.

[0011] In one example, the first thread structure and the second thread structure may be respective tapered constant pitch threads and the first and second helical torque shoulder may be formed by respective non-tapered structures.

[0012] The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features, objects, and advantages will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Fig. 1 is a schematic profile of a thread form;

Claims

1. A tubular connection, comprising:

a pin member having:

a first tapered constant pitch thread having a root, a crest, a stab flank and a load flank;

a first variable pitch helical torque shoulder surface spaced axially along the pin member from the first tapered constant pitch thread, the first variable pitch helical torque shoulder surface is non-tapered;

a box member having:

a second tapered constant pitch thread having a root, a crest, a stab flank and a load flank;

a second variable pitch helical torque shoulder surface spaced axially along the box member from the second tapered constant pitch thread, the second variable pitch helical torque shoulder surface is non-tapered;

the pin member and the box member configured such that in the stab position the first variable pitch helical torque shoulder surface does not engage or overlap with the second variable pitch helical torque shoulder surface.

2. The tubular connection of claim 1 wherein both (i) the first tapered constant pitch thread and the first variable pitch helical torque shoulder surface are sized and located relative to each other and (ii) the second tapered constant pitch thread and the second variable pitch helical torque shoulder surface are sized and located relative to each other, such that during rotational make-up of the pin member and box member under control of interaction between the first tapered constant pitch thread and the second tapered constant pitch thread, the first variable pitch helical torque shoulder surface is guided into cooperating alignment with the second variable pitch helical torque shoulder surface.

3. The tubular connection of claim 1, wherein:

a root diameter of the first variable pitch helical torque shoulder surface is smaller than both a starting root diameter of the first tapered constant pitch thread and an ending root diameter of the first tapered constant pitch thread;

a root diameter of the second variable pitch helical torque shoulder surface is smaller than both a starting root diameter of the second tapered constant pitch thread and an ending root diameter of the second tapered constant pitch thread.

4. The tubular connection of claim 3 wherein:

the pin member includes a first transition zone axially between the first variable pitch helical torque shoulder surface and the first tapered constant pitch thread, the first transition zone including a first seal surface;

the box member includes a second transition zone axially between the second variable pitch helical torque shoulder surface and the second tapered constant pitch thread, the second transition zone including a second seal surface;

in full made up condition the first seal surface engages the second seal surface for sealing.

5. The tubular connection of claim 4 wherein:

an axial length of the first variable pitch helical torque shoulder surface is less than an axial length of the first tapered constant pitch thread;

an axial length of the second variable pitch helical torque shoulder surface is less than an axial length of the second tapered constant pitch thread.

6. The tubular connection of claim 5 wherein:

the axial length of the first variable pitch helical torque shoulder surface is between about 15% and 60% of the axial length of the first tapered constant pitch thread;

the axial length of the second variable pitch helical torque shoulder surface is between about 15% and 60% of the axial length of the second tapered constant pitch thread.

7. The tubular connection of claim 3 wherein:

the first variable pitch helical torque shoulder surface extends for no more than seven turns and the first tapered constant pitch thread extends for at least ten turns;

the second variable pitch helical torque shoulder surface extends for no more than seven turns and the second tapered constant pitch thread extends for at least ten turns.

8. The tubular connection of claim 1 wherein the first variable pitch helical torque shoulder surface runs into a first substantially cylindrical torque shoulder surface of the pin member and the second variable pitch helical torque shoulder surface runs into a second substantially cylindrical torque shoulder surface of the box member, in fully made-up position of the connection the first substantially cylindrical torque shoulder surface engages the second substantially cylindrical torque shoulder surface and the first variable pitch helical torque shoulder surface engages the second variable pitch helical torque shoulder surface, such that a combined cylindrical and variable pitch helical torque shoulder results.

9. The tubular connection of claim 2 wherein upon final make-up of the pin member and the box member the first variable pitch helical torque shoulder surface and second variable pitch helical torque shoulder surface are engaged at a location that is one of (i) at a pin-nose/box-base location that intersects the inside diameter of the connection, (ii) at a pin-base/box-face location that intersects the outside diameter of the connection or (iii) at a middle-wall section of the connection as a center shoulder of the connection.

10. A method of joining tubular length of oil country tubular casing or piping, the method comprising:

utilizing a first tubular member having an associated pin member with a first tapered constant pitch thread structure and a first non-tapered variable pitch helical torque shoulder spaced axially along the pin member from the first thread structure;

utilizing a second tubular member having an associated box member with a second tapered constant pitch thread structure and a second non-tapered variable pitch

helical torque shoulder spaced axially along the box member from the second thread structure;

engaging the pin member and box member with each other into a stab position that is defined by interaction of the first thread structure and the second thread structure, in the stab position the first variable pitch helical torque shoulder does not contact or axially overlap with the second variable pitch helical torque shoulder;

rotating at least one of the first tubular member or the second tubular member such that interaction between the first thread structure and the second thread structure guides the first non-tapered variable pitch helical torque shoulder into cooperating alignment with the second non-tapered variable pitch helical torque shoulder.

11. The method of claim 10 wherein the pin member is formed integral with the first tubular member and the box member is formed integral with the second tubular member.

12. The method of claim 10 wherein the first thread structure is a tapered constant pitch thread and the second thread structure is a tapered constant pitch thread.

13. A tubular connection, comprising:

a pin member having:

a first tapered constant pitch thread structure;

a first variable pitch helical torque shoulder surface spaced axially along the pin member from the first thread structure, wherein the first variable pitch helical torque shoulder is non-tapered;

a box member having:

a second tapered constant pitch thread structure;

a second variable pitch helical torque shoulder surface spaced axially along the box member from the second thread structure, wherein the second variable pitch helical torque shoulder is non-tapered;

wherein the first thread structure and the second thread structure are sized and located to control a stab position of the tubular connection, in the stab position the first variable pitch helical torque shoulder surface does not engage or overlap with the second variable pitch helical torque shoulder surface.

14. The tubular connection of claim 13 wherein: both (i) the first thread structure and the first variable pitch helical torque shoulder surface are sized and located relative to each other and (ii) the second thread structure and the second variable pitch helical torque shoulder surface are sized and located relative to each other, such that during rotational make-up of the pin member and box member under control of interaction between the first thread structure and the second thread structure, the first variable pitch helical torque shoulder surface is guided into cooperating alignment with the second variable pitch helical torque shoulder surface.

15. The tubular connection of claim 13 wherein the first variable pitch helical torque shoulder surface extends substantially to a first substantially cylindrical torque shoulder of the pin member and the second variable pitch helical torque shoulder surface extends substantially to a second substantially cylindrical torque shoulder of the box member, in full made-up position of the connection the first substantially cylindrical torque shoulder engages the second substantially cylindrical torque shoulder and the first variable pitch helical torque shoulder surface engages the second variable pitch helical torque shoulder surface, such that a combined cylindrical and helical torque shoulder results.