

CONNECTORS FOR REINFORCING BARS

Field of the Invention

This invention relates to connectors for reinforcing bars and refers particularly, though not exclusively, to connectors for reinforcing bars used to reinforce concrete structures such as concrete piles.

Definitions

Throughout this specification, a reference to a bar to be taken as being a reference to a reinforcing bar, commonly known as a re-bar or reo-bar.

Background

Reinforcing bars are used to reinforce concrete structures. An example of such a structure is a concrete pile. Quite often, the length of bar required is greater than the available lengths of bars. Therefore, bars must be joined together in a generally axial manner to achieve the desired length. There have been a number of proposals and methods for achieving such joins:

- (a) joining them in a side-by-side manner using wire tied around the two bars. International standards require an overlap length of fifty-two times the diameter of the bars. This is wasteful in material. Therefore, there is a risk that a builder will not use the multiplier of fifty-two, but a lower number. Also, the tying may not have sufficient strength.

- (b) using a crimping sleeve to crimp them together. However, as the bars are made of steel, the crimping sleeve must be made of a strong material such as steel. This requires a large crimping machine. As the application of the crimping sleeve may be in a confined space a large crimping machine is impractical. It is also difficult to move over a large construction site.
- (c) thread the ends of the bars and use a threaded sleeve. This requires the end of each bar to be threaded, the sleeve to be applied to one bar, then the other bar rotated around its longitudinal axis to effect the connection. This can be quite awkward to achieve.
- (d) A similar system to (c) above but where externally and internally threaded intermediate members screwed onto threaded ends of the bars. This still requires ends of the bars to be threaded.
- (e) The system of any earlier patent application (Malaysian patent application no. PI 9704269) filed 15 September 1997, the contents of which are hereby incorporated by reference. However, this requires each segmented member to be sized exactly for each size of bar. This leads to larger manufacturing costs, and greater inventory – particularly in a construction site. It may also result in an ineffective connection.

It is therefore the principal object of the present invention to provide a connector for reinforcing bars which is easily assembled and used.

Summary of the Invention

With the above and other objects in mind, the present invention provides a connector for axial connection of two reinforcing bars, the connector including a sleeve with a first threaded bore at a first end thereof, and a second threaded bore at a second end thereof; a first attachment member adapted to releasably secure a first reinforcing bar to the sleeve, and a second attachment member adapted to releasably secure a second reinforcing bar to the sleeve; each of the first and second attachment members including a wedge sleeve substantially truncated conically shaped and having a central bore through which the bar can be placed, and a locking sleeve having a substantially cylindrically shaped body with a threaded external surface and an internal bore adapted to engage the first wedge sleeve.

Description of Drawings

In order that the invention may be readily understood and put into practical effect, there shall now be described a preferred construction of a connector for reinforcing bars, the description being by way of non-limitative example only and being with reference to the accompanying illustrative drawings in which:

Figure 1 is an exploded perspective view;

Figure 2 is a longitudinal cross-sectional view; and

Figure 3 is a series of views showing the use of the connector.

Description of Preferred Embodiment

To first refer to Figures 1 and 2, there is shown a connector 10 for joining two bars 12, 14.

The connector 10 has sleeve 16 with a central bore 18 having a tread 20 thereon. Intermediate the length of the bore 18 there is a radially inwardly directed rib 22 which acts as an end stop. The internal radius of rib 22 should be less than the radius of both bars 12, 14.

For each bar 12, 14, there is an attachment member 24 to secure the bars 12, 14 to sleeve 16. The attachment members 24 each have a wedge sleeve 26 and a locking sleeve 28.

The wedge sleeves 26 are shaped as a truncated cone and have a central bore 30 through which the bars 12, 14 can pass. Bore 30 is substantially cylindrical. Therefore, side wall 32 of sleeve 26 increase in thickness as the external radius increases. A slot 34 is provided in side wall 32 extending longitudinally for the full length of side wall 32. Slot 34 allows for adjustment in the diameter of bars 12, 14.

Locking sleeve 28 has an external surface 36 which has a thread 38 thereon matching thread 20 so the two can mutually engage. It also has a central bore 40 with a substantially smooth surface and which is conically shaped, the angle of taper of bore 40 being substantially the same as that of side walls 32 of sleeves 26.

At their outermost end, the sleeves 28 have a flange 42 of significantly increased radius. Flange 42 may be provided with suitable gripping means for spanners such as, for example, holes 44 to receive a pin of a special spanner, hexagonal flats, or the like.

To use the connector 10 is illustrated in Figure 3(a) through to (f). The first locking sleeve 28 is loosened and the connector 10 is placed over bar 12 until bar 12 contacts rib 22. Locking sleeve 28 is then tightened by rotation. Thread 38 engages thread 20 and locking sleeve 28 is drawn axially inwardly. Bore 40 contacts side wall 32 to thus create a wedging or jamming force on bar 12. Upon locking sleeve 28 being fully tightened, bar 12 is securely held in place.

Second locking sleeve 228 is then loosened and bar 14 is passed through bores 40, 30 and 18 until it contacts rib 22. Second locking sleeve 228 is tightened in like manner to first locking sleeve 28 to thus securely hold bar 14 in place.

Therefore, the two bars 12, 14 are securely held together axially with connector 10. This required only a spanner, and with no wastage of material.

By having slots 34, different diameters of bars 12, 14 can be accommodated.

Also, by using threaded engagement it can be released, if desired, without destroying the connector 10, or any of its component parts. This is not the case with tying with wire, or crimping.

The Claims

1. A connector for axial connection of a first reinforcing bar and a second reinforcing bar , the connector including a sleeve with a first threaded bore at a first end thereof, and a second threaded bore at a second end thereof, a first attachment member adapted to releasably secure the first reinforcing bar to the sleeve, and a second attachment member adapted to releasably secure second reinforcing bar to the sleeve; each of the first and second attachment members including a wedge sleeve substantially truncated conically shaped and having a central bore through which the relevant one of the first and second bars can be passed, and a locking sleeve having a substantially cylindrically shaped body with a threaded external surface and an internal bore adapted to engage the wedge sleeve.
2. A connector as claimed in claim 1, wherein the wedge sleeve has a side wall having an angle of taper, the central bore being substantially cylindrical.
3. A connector as claimed in claim 2, wherein the side wall has a longitudinally extending slot therethrough.
4. A connector as claimed in claim 2 or claim 3, wherein the internal bore is substantially conical.
5. A connector as claimed in claim 4, wherein the conical internal bore has a second angle of taper.
6. A connector as claimed in claim 5, wherein the second angle of taper is substantially the same as the angel of taper.



7. A connector as claimed in any one of claims 1 to 6, wherein the second threaded bore and the first threaded bore are the same.
8. A connector as claimed in claim 7, wherein the thread of the external surface is the same as the thread of the first and second threaded bores.
9. A connector as claimed in any one of claims 1 to 8, wherein between the first threaded bore and the second threaded bore is a rib of an internal radius less than the radius of the first reinforcing bar and the radius of the second reinforcing bar so as to act as an end stop for both the first and second reinforcing bars.
10. A connector as claimed in any one of claims 1 to 9, wherein the body has an outer end with a flange of enlarged radius, the flange having a tool grippable means.
11. A connector as claimed in any one of claims 1 to 10, wherein the first attachment member and the second attachment member are the same.

