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(54) **Improvements in and relating to scaffolding systems.**

(57) An adjustable length leg for use as a vertical member in a scaffolding system is described. The leg consists of two sections, one of which is telescopically receivable in the other. Means for fixing the two sections in a desired relative position is provided. Both sections have at least one engagement member which forms a friction fit with the other section when the two sections are telescopically engaged. The engagement means preferably consist of crimpings, inward crimpings on the outer section and outward crimpings on the inner section.

This invention relates to scaffolding systems.

Scaffolding systems generally consist of interconnected horizontal and vertical members. The horizontal and vertical members may both be in the same form, e.g. tubular members, or the horizontal members can take the form of a space frame comprising two horizontal chord members interconnected and spaced by bracing members. Scaffolding systems have a multiplicity of uses, a particularly common one of which is to support beams, the beams being used, for example, as a work platform or as a base for the production of concrete slabs during the construction of buildings.

The vertical leg members of such scaffolding systems are often adjustable in length to allow variable height structures to be formed. This adjustability is commonly achieved by forming the leg in two parts, one of which is telescopically received within the other, and providing both parts with holes whereby they may be pinned together in any one of a number of desired relative positions.

The problem with this arrangement is that the connections produced by pinning the two parts of a leg together is loose and constitutes a point of weakness in a scaffolding structure formed from the legs. In order to rigidify the connection and thereby to provide structural integrity, efforts have been directed at ensuring that the two parts are a close tolerance fit. This has been achieved by employing very accurately dimensioned tubes to form the two parts, which is expensive. It has also meant that it is not possible to use standard tubes, particularly if plating is to be applied, or if a long length is to be telescoped.

To avoid having to employ accurately dimensioned tubing, it has been suggested to swage the outer part to produce the desired close tolerance fit thereof with the inner part. This step adds to the manufacturing cost and, as a result, only a short length of the outer part is normally swaged. Thus a close tolerance fit is only provided over a short distance and the structural integrity of the connection is not significantly improved.

An adjustable length leg for a scaffolding system in accordance with the invention comprises a main leg section and an extension section, the sections being tubular and having diameters such that the extension section is telescopically receivable within the main leg section, and means for fixing the two sections in at least one relative position when telescopically engaged, wherein at least one engagement member is provided on each section which forms a friction fit with the other section when the two sections are telescopically engaged.

In a particularly preferred embodiment, the extension section is provided with at least one engagement member at the end thereof which is telescopically received in the main leg section. The main leg section is provided with at least one engagement

member at both ends thereof so that the extension section can be inserted therein from either end. Therefore when the two sections are telescopically engaged, a friction fit will be formed at both ends of their overlapping portions. This has been found to be sufficient to significantly increase the structural integrity of a pinned connection between the two. The need for accurately dimensioned sections is obviated and standard sections can be readily employed.

Preferably, the engagement member of the main leg section comprises a reduced diameter region whilst the engagement member of the extension section comprises an enlarged diameter region. In both cases, the engagement member suitably comprises a number of equi-angularly spaced crimpings formed in respectively the main leg section and the extension section, the crimpings in the former being inwards and in the latter being outwards.

It has been found that good results are achieved with the use of either three crimpings or four crimpings.

The fixing means may comprise holes in both the main leg section and the extension section whereby the two may be pinned together. These are positioned so that they will be aligned when the crimpings are aligned. Therefore to erect the leg, the extension section will be inserted into the main leg section and rotated, by 120°, in the case of three crimpings, or by 90°, in the case of four crimpings, to align the crimpings. The two sections will then be pinned together.

The main leg section is suitably provided with sockets to allow attachment of one or more horizontal members thereto and/or one or more bracing members.

The invention will now be further described by way of example with reference to the accompanying drawings in which:-

Figure 1 is a side view of a main leg section of a leg in accordance with the invention;

Figure 2 is a side view of an extension section of a leg in accordance with the invention;

Figure 3 is a side view of one end of the main leg section of Figure 1;

Figure 4 is a view on A-A of the leg section end of Figure 3;

Figure 5 is a side view of one end of the extension section of Figure 2; and

Figure 6 is a view on B-B of the extension section end of Figure 5.

The main leg section 2 and extension section 4, shown respectively in Figures 1 and 2, are both tubular in form. The diameters thereof are such that the extension section 4 is telescopically receivable in the main leg section 2 from either end thereof. The ends of the main leg section 2 are each provided with two apertures 6 whereby it may be pinned to the extension section 4 through corresponding apertures 8 provided therein by way of, for example, a U-clip. It

will be seen from Figure 2 that a plurality of apertures 8 are provided in the extension section 4 whereby a leg formed from it and the main leg section 2 can be set at one of a number of different lengths.

The main leg section 2 additionally has a number of sockets 10 welded, see 12, thereto. In the arrangement shown in Figure 1, two sets of sockets 10 are provided, each set consisting of four equi-angularly spaced sockets 10. This particular arrangement allows a space frame, consisting of two chords interconnected and spaced by bracing members, to be attached at the end of each of its chords to the main leg section 2. It will be appreciated that more than two sets of sockets could be provided and that these could be such as to allow attachment of a horizontal tubular member to the main leg section 2 or attachment of a diagonal bracing member thereto.

At both ends, the main leg section 2 has attached thereto by welding, see 14, a ring 16. Immediately above the ring 16, the end of the main leg section 2 is formed with three inward crimpings 18. These are equi-angularly spaced around the leg section 2.

The extension section 4 has a ring 20 at one end thereof. At the other end thereof, as shown in Figures 5 and 6, it is provided with three equi-angularly spaced outward crimpings 22.

The inward crimpings 18 of leg section 2 define sections of a circle with diameter C. The outward crimpings 22 of the extension section 4 define sections of a circle with diameter D. Diameter C is arranged to be equal to the outer diameter of the extension section 4, whilst diameter D is arranged to be equal to the inner diameter of main leg section 2. Therefore when extension section 4 is inserted in main leg section 2, a friction fit will be formed at either end of the region of overlap between, firstly, the inward crimpings 18 and the outer face of the extension section 4 and, secondly, the outward crimpings 22 and the inner face of the main leg section 2.

It will be appreciated that the pinned coupling between the main leg section 2 and the extension section 4 will be intermediate the two friction fits formed therebetween. This will rigidify the connection between the two sections 2 and 4 thereby to produce structural integrity.

The crimpings 18 and 22 can be readily produced without adding to the cost of production of the leg formed from the two sections 2 and 4. Furthermore it is easy to so size the crimpings 18 and 22 as to ensure a good friction fit between these and the relevant section 2 or 4.

The apertures 6 and 8 and crimpings 18 and 22 are arranged so that when one is aligned, so is the other. Thus in use, with the two members sections 2 and 4 connected, the points of contact between the crimpings 18 and 22 and the outer face of the extension section 4 and inner face of the main leg section 2 will be in line. To form the leg 2, the extension sec-

tion 4 is fed into the main leg section 2 with the crimpings 18 and 22 out of alignment and then rotated by 120° to bring them into alignment.

Although the two leg sections 2 and 4 are illustrated here as having three crimpings, it will be appreciated that other numbers of crimpings could be employed. A particularly preferred alternative is to provide four crimpings, and in this case, the extension section 4, after insertion into the main section 2, will be rotated by 90°.

Claims

1. An adjustable length leg for a scaffolding system comprising a main leg section and an extension section, the sections being tubular and having diameters such that the extension section is telescopically receivable within the main leg section, and means for fixing the two sections in at least one relative position when telescopically engaged, wherein at least one engagement member is provided on each section which forms a friction fit with the other section when the two sections are telescopically engaged.
2. A leg as claimed in Claim 1, wherein the extension section is provided with at least one engagement member at the end thereof which is telescopically received in the main leg section.
3. A leg as claimed in Claim 1 or Claim 2, wherein the main leg section is provided with at least one engagement member at both ends thereof.
4. A leg as claimed in any preceding Claim, wherein the engagement member(s) of the main leg section comprises a reduced diameter region thereof.
5. A leg as claimed in any preceding Claim, wherein the engagement member(s) of the extension section comprises an enlarged diameter region thereof.
6. A leg as claimed in any preceding Claim, wherein each engagement member comprises a number of equi-angularly spaced crimpings formed in the section.
7. A leg as claimed in Claim 6, wherein the crimpings in the main leg section are inwards and the crimpings in the extension section are outwards.
8. A leg as claimed in Claim 6 or Claim 7, wherein each engagement member comprises three crimpings.

9. A leg as claimed in Claim 6 or Claim 7, wherein each engagement member comprises four crimpings.

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10. A leg as claimed in any preceding Claim, wherein the fixing means comprises holes provided in both the main leg section and the extension section whereby the two sections may be pinned together.

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11. A leg as claimed in Claim 10 when dependent on any one of Claims 6 to 9, wherein the holes in the main leg section and extension section are positioned so that they will be aligned when the crimpings in the two sections are aligned.

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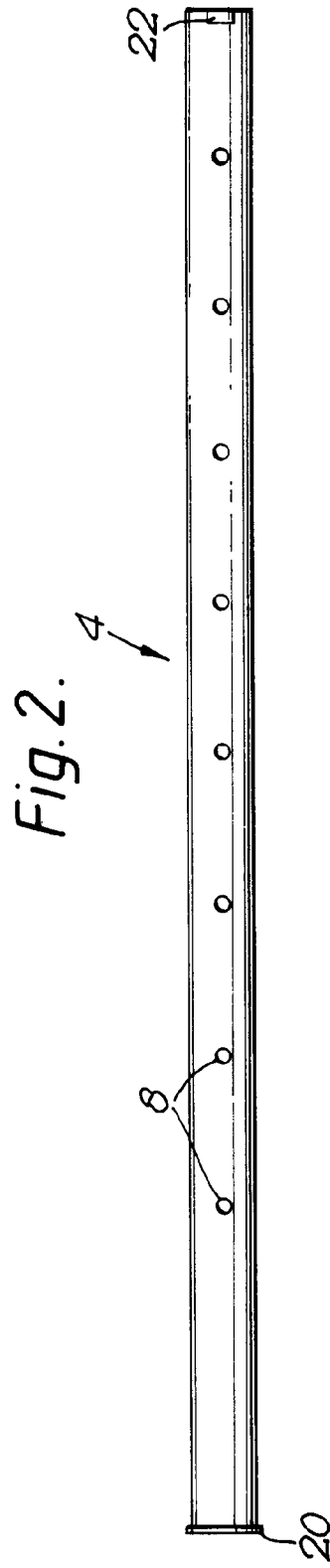
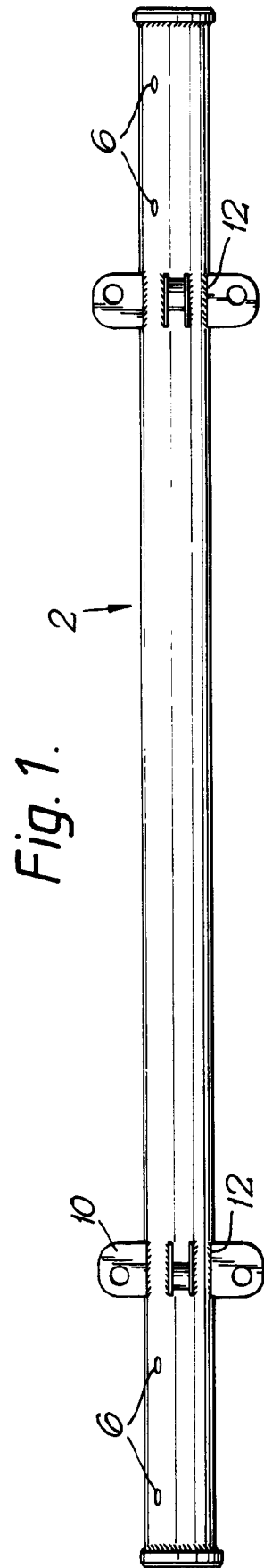
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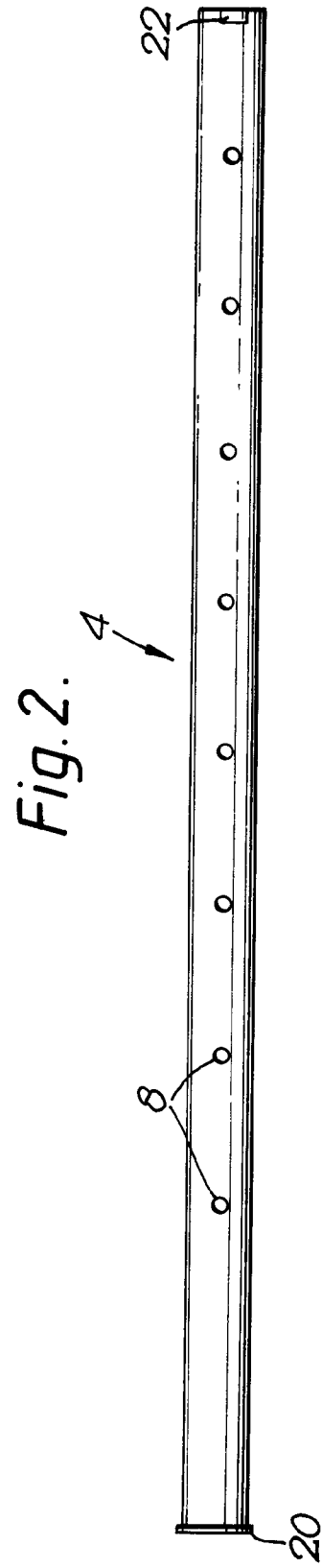
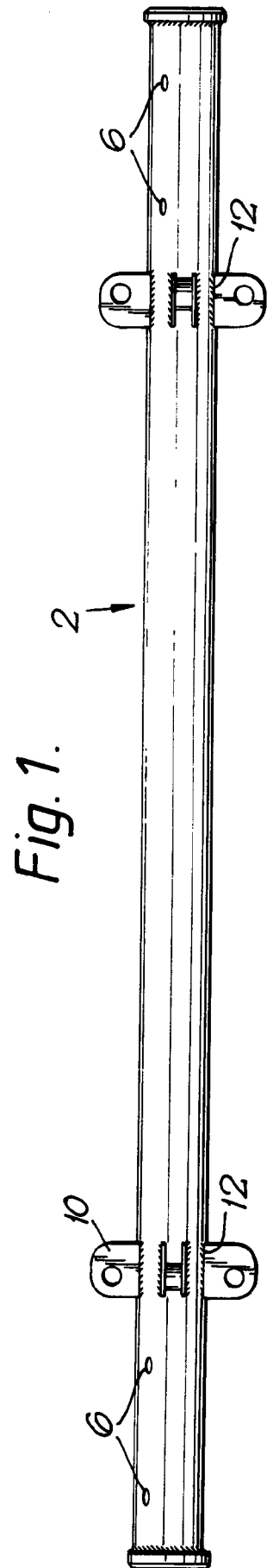
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European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 93 30 0669

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-A-2 235 304 (DOLL) * the whole document * -----	1,2,4-7, 9,10	E04G1/18 E04G25/04
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E04G
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 13 JULY 1993	Examiner PAETZEL H.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>I : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>..... & : member of the same patent family, corresponding document</p>			

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