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EUROPEAN PATENT APPLICATION

21 Application number: 87200269.6

51 Int. Cl.³: **E 04 G 7/30**

22 Date of filing: 18.02.87

30 Priority: 18.02.86 NL 8600407

43 Date of publication of application:
02.09.87 Bulletin 87/36

84 Designated Contracting States:
AT BE CH DE ES FR GB IT LI LU NL SE

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54 **Scaffolding system.**

57 Scaffolding systems should have the facility of building extensions to it when needed. Yet required extensions, while using the known systems, are not feasible since mounting and dismounting possibilities are not provided for except for mounting and dismounting complete scaffolding floor stages. Intermediate mounting or dismounting cannot be effected while using known systems.

The invention provides for an interlocking scaffolding system which also facilitates unlocking of platforms and flattened end sections 14 of struts 3,4 thereby maintaining all required stability of the cooperating scaffolding parts having been erected.

This is achieved by the the function of angular rotational movement between the interlocking member parts of a joint and inherent use of special brackets 12 for not only interlockingly clamping platform ends to the bracing frames but also by the additional use of special brackets 12 for interlocking flattened end portions 14 of struts 3,4, each having its own matching opening 15 passing over a recessed protrusion which is welded to the standard or post of the bracing frame, whereafter an interlocking nose or cam member 16, integrally forming part of said matching opening 15 is hooked in, thereby blocking said recess 13. The matching opening 15 is so no longer allowed to give free passage to the protrusion 12 any longer, thereby giving an immediate interlocking function.

For interlocking the platform end sections to special brackets, a similar angular rotation is required while positioning or taking away the platforms, which in their ultimate operational position are automatically interlocked with respect to said brackets.

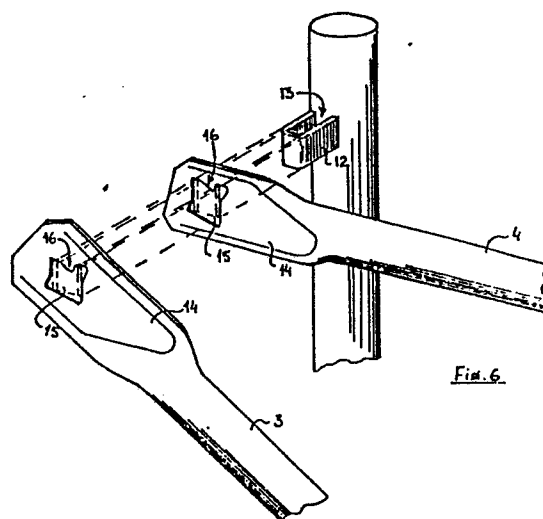


Fig. 6

Scaffolding system.

. The invention relates to a scaffolding system comprising vertical bracing frames, horizontal working platforms, diagonal struts and horizontal struts, each end section of which being provided with at least one matching opening known
05 per se, the cross sectional passage of which is corresponding with a protrusion, a number of which being provided on the bracing frames for interlocking scaffolding parts and further being provided with elements of different kinds on or in the vicinity respectively of said end sections with the purpose to interlock said end section, starting from an inoperative position for initial passage with
10 respect to a first protrusion and after angularly rotating said scaffolding part into its final operative position mounting its opposite end section upon passage over a second protrusion and thereafter interlocking it.

Some present scaffolding systems are provided at the upperside of the vertical bracing frame with round protrusions which fit in matching openings of the
15 platform end portions or sections. To prevent blowing up of these platform ends the latter are covered or secured by a profile which simultaneously has the function of a lower traverse connector in the vertical bracing frame. It is a disadvantage of this principle that such a scaffolding can only be mounted and dismantled respectively in complete platform assembly stages. Such a scaffolding cannot be wholly or partly extended or dismantled at one end. For
20 mounting of railing or diagonal struts on the vertical bracing frames use is often made of so called tilting locks which are being welded at certain positions to one or both vertical bracing frames. A tilting lock normally consists of a massive steel pin having a vertical slot within which a hinged plate is fitted.
25 This construction is vulnerable and subject to accumulation of dirt and rust, preventing optimal operation of the tilting lock. Scaffolding parts are mostly hot dip galvanized. The plate of the tilting locks can so only lateron be mounted, causing much additonal handling and often additional transporting costs.

30 According to the invention the scaffolding system avoids said disadvantages. To that purpose the vertical protrusions on the vertical bracing frames are so shaped that the platforms can be mounted and dismantled respectively while the bracing frame mounted on top can remain in its operating position. While
35 providing one or both standards or posts of the vertical bracing frame with protrusions of such shape that diagonal and horizontal struts respectively can be

- locked automatically after fitting and rotating, said fitting lock can be replaced by a cheaper and less vulnerable scaffolding part.

The invention will hereinafter be explained by the drawing in which:

05 Fig. 1 is a perspective view of a scaffolding to which the invention is applied, with vertical bracing frames 1, platforms 2, diagonal struts 3 and horizontal struts 4;

Fig. 2 is a perspective view of the connection between vertical bracings and platforms;

10 Fig. 3 is a cross section of a connection between the vertical bracing frames and the platforms in an embodiment of Fig. 2;

Fig. 4 is a second embodiment in perspective view of a similar connection between the vertical bracing frames and the platforms;

15 Fig. 5 is a cross section of the connection between the vertical bracing frames and platforms similar to the embodiment in Fig 4;

Fig. 6 is a perspective view of a connection between the vertical bracing frame 1 and a diagonal strut 3 and also a horizontal strut 4;

Fig. 7 is a front view of a connection between a vertical bracing frame 1 and a horizontal strut 4 having a passage opening of a first kind;

20 Fig. 8 is a perspective view of a connection between a vertical bracing frame and a diagonal and horizontal strut respectively having a second passage opening and a lock;

Fig. 9 is a front view of the connection as shown in Fig. 8 and it also shows the locking plate separately;

25 Fig. 10 is another front view of a connection being shown in an unlocked and in a locked position respectively and

Fig. 11 is a perspective view of a hingeable locking member provided on the end portion of a horizontal strut.

30 According to the embodiment of Figs. 2 and 3 the uppermost traverse connector 6 of the vertical bracing frame 1 consists of a tubular profile upon which are welded two members each consisting of sidewardly and upwardly directed protrusions 5. In the end portions of the horizontal strut matching openings 8 are provided which can be fitted over the protrusions 5. After the
35 positioning of the platforms 2 blowing up is avoided by the lowermost traverse connector 7, of the vertical bracing frame placed on top of the first one. Since both inner surfaces of the protrusions 5 are tapering in an upward direction -

converging in Fig. 3 - it remains possible to take away the platform 2 by a restricted anti-clockwise rotation followed by lifting the matching openings 8 from the protrusions 5. This means that such a scaffolding system can be mounted and dismounted respectively along a vertical line. Since the opposite part of the protrusion 5, facing the tapered portion, is in its mounted position contacting the upper edge of the matching opening 8 in the platform 2, this causes at least in one direction a stiff joint thereby ensuring mounting stability. In the embodiment of Fig 4 the uppermost traverse connector comprises an Omega shaped profile 9 whereas the protrusions 10 for fitting the platforms 2 consist of U-shaped brackets which are sidewise pointing in an upward direction from the uppermost traverse connector.

The required stability during mounting is obtained by the fact that the outer side of the platform abuts against the upper side of the Omega shaped profile. Instead of using an Omega shaped profile also use can be made of an inverted T-shaped profile. This embodiment can be performed much more compact and cheaper than when it is performed according to Figs. 2 and 3. The platforms 2 are secured against blowing up forces by the lowermost traverse connector 11 being shaped as a T profile from a tubular profile as is shown in Figs. 6 and 7 one or both standards of the vertical bracing frame 1 are provided with U-shaped brackets 12 having their legs welded to the standard thereby creating a rectangular protrusion with an inner opening or recess 13. A flattened end 14 of a horizontal strut 4 and a diagonal strut 3 respectively are each provided with a matching opening 15 of such a shape that it can fit over the protrusion 12 when positioned correctly.

By angularly rotating the horizontal and diagonal struts 4 and 3 respectively the interlocking element or nose 16 is moved into the inner opening 13 of the protrusion 12 causing the locking of the diagonal or horizontal struts during its mounting position.

Naturally one can create various and different shapes of protrusions and cooperating recesses for obtaining an interlocking arrangement after rotating one part with respect to the other. Each diagonal strut 3 and horizontal strut 4 is also flattened at its opposite end and provided with a rectangular matching opening which gives passage for the protrusion 12, see Figs. 8 and 9. Once the matching opening fits the protrusion the joint is interlocked by sliding the locking plate 17 in a downward direction, its nose member 19 thereby hooking in the recess 13 of the protrusion 12. The locking plate 17 is of symmetrical design so that also an inverted horizontal or diagonal strut can be correctly

fitted. In this embodiment the locking plate is slidebly engaged in the flattened center portion of the strut's end and is moved parallelly thereto.

The embodiment of Fig. 10 shows another shape of the interlocking element or nose member which is integral to the matching opening circumference. The embodiment of Fig. 11 shows a simple movable nose member for interlocking the strut's end with respect to the recessed protrusion. In the event that such a movable nose member also remains in its interlocking position when the strut is in an inverted position, the flattened portion may be provided with protruded areas or corrugated portions cooperating with the opposite inner surface of the nose member to cause a mutual interlock once the nose member is in its operational position. The movable or hingeable nose member carries at its right handside an extension to facilitate hammer setting and hammer lifting respectively for effecting the interlocking function or having the nose member unlocked respectively.

Claims:

1. Scaffolding system comprising vertical bracing frames, horizontal working platforms, diagonal struts and horizontal struts, each end section of which being provided with at least one matching opening known perse, the cross sectional passage of which is corresponding with a protrusion, a number of which being
05 provided on the bracing frames for interlocking scaffolding parts and further being provided with elements of different kinds on or in the vicinity respectively of said end sections with the purpose to interlock said end sections, starting from an inoperative position for initial passage with respect to a first protrusion and after angularly rotating said scaffolding part into its final
10 operational position mounting its opposite end section upon passage over a second protrusion and thereafter interlocking it, characterized by the fact that for mounting the scaffolding structure cooperation is effected by the operational combination of the following scaffolding parts:
- 15 a) each vertical bracing frame is provided at its inner circumference upon the standards with a number of protrusions of a first kind for interlocking of the diagonal and horizontal struts respectively and said frame is further provided with a number of protrusions of a second kind, positioned on an upper traverse connector of the bracing frame for interlocking of the working platform ends
20 by means of a lower traverse connector of a bracing frame which is positioned on top of the first bracing frame;
- b) diagonal and horizontal struts respectively are provided at opposite ends with a flattened portion which is provided with a first matching opening for passage
25 of said first protrusion of a first kind and a second matching opening for passage of said second protrusion of a second kind, one and the other in such a way that the cross sectional area of the first matching opening has a remarkably larger surface than the complete cross sectional area of said protrusion whereas the second matching opening has nearly the same dimension
30 as the cross sectional area of said protrusion;
- c. the first matching opening in the diagonal and horizontal struts respectively comprises at its inner circumference a locking element which in its operative position automatically establishes an interlocking engagement with the protrusion
35 of a first kind by effecting an angular rotation of the scaffolding part;

d. the second passage opening in the diagonal and horizontal struts respectively is provided with a separate second interlocking element having a similar passage matching cross sectional area as is provided with the flattened end portion and moreover there is provided at least one second interlocking element which, in its interlocking position, does decrease said passage matching opening, leaving the latter entirely free for passage during the mounting operation;

e. each working platform end portion being provided with at least two matching openings which cooperate with protrusions of a second kind which are provided on the bracing frame whereby the interlocking element consists of the lower traverse connector of the next bracing frame in top of the lower bracing frame.

2. Scaffolding system according to claim 1, characterized in that a first matching opening in an end portion of a diagonal and horizontal strut respectively is not congruent to the cross section of a protrusion along the circumference of a bracing frame, in such a way, that said end portion, only after being angularly rotated with respect to said protrusion in its operative position in the scaffolding structure, can fit over said protrusion and thereupon be re-rotated, in which latter position an interlocking element, which is integral to the matching opening, automatically interlocks this end portion with regard to said protrusion.

3. Scaffolding system according to claim 2, characterized in that a cross section of the protrusion, positioned at the far side of the standard of the bracing frame is of general rectangular shape whereas a cross section nearby is of less greater shape, one and the other in such a way, that a nose or cam member provided upon the interlocking element is automatically interhooked at the location of the decreased cross sectional area.

4. Scaffolding system according to any one of the foregoing claims, characterized in that the cross section of the matching opening is polygonal and all around closed in itself.

5. Scaffolding system according to anyone of claims 1-4, characterized in that at the opposite end of the diagonal or horizontal struts respectively, the cross section of the matching opening is almost congruent to the cross section of the protrusion while assuming the same position in its mounted position whereas a separate interlocking member, preferably a locking slider plate having a nose or cam member, during the mounting operation, leaves said matching opening entirely free while simultaneously decreasing the passage opening of said matching opening for interlocking movement with respect to said protrusion resulting in said cam member occupying said matching opening partially.
6. Scaffolding system according to claim 5, characterized in that the locking slider plate is provided with two oppositely directed nose or cam members for interlocking a diagonal or horizontal strut respectively with respect to the standard in its different positions.
7. Scaffolding system according to anyone of the foregoing claims 1-6, characterized in that the protrusion consists of a U-shaped bent metal strip which has been welded to the standard or post.
8. Scaffolding system according to claims 1-7, characterized in that there is provided on the uppermost traverse connector of the bracing frame at least one saddle shaped twinsided protrusion which provides for fitting each of the matching openings at two adjacently extending platform end sections.
9. Scaffolding system according to claim 8, characterized in that a cross section of the protrusion at the lowermost portion of the matching opening is almost congruent to the cross section of the matching opening whereas the cross section of the protrusion in an upward direction decreases, in such a way that both inwardly directed surfaces of the twinsided protrusion converge in a downward direction and both outwardly directed surfaces are parallel to each other.
10. Scaffolding system according to claim 8, characterized in that the uppermost traverse connector consists of an inverted T or Omega shaped profile, the flanges serving as a supporting surface for both platform end sections whereas the web portion is located between said platform end sections.

- 11. Scaffolding system according to claims 9 and 11, characterized in that at the lower side of the bracing frame there is provided a horizontal beam for locking of both platform end sections being hooked over the protrusions.

- 05 12. Scaffolding system according to claim 10, characterized in that the horizontal beam consists of a T-shaped profile of which the vertical web is located in the mounted position of the uppermost bracing frame between the platform end sections.

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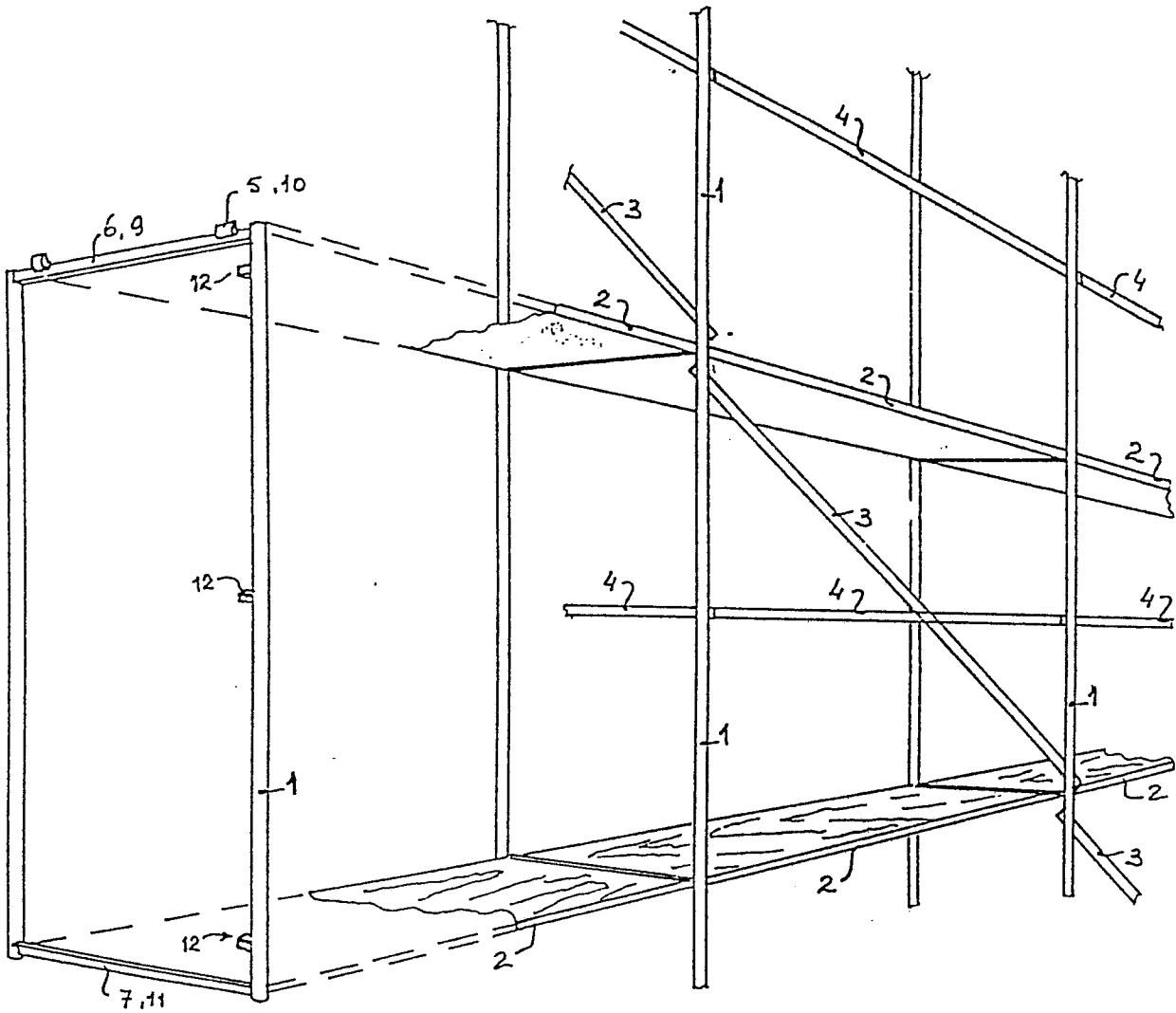
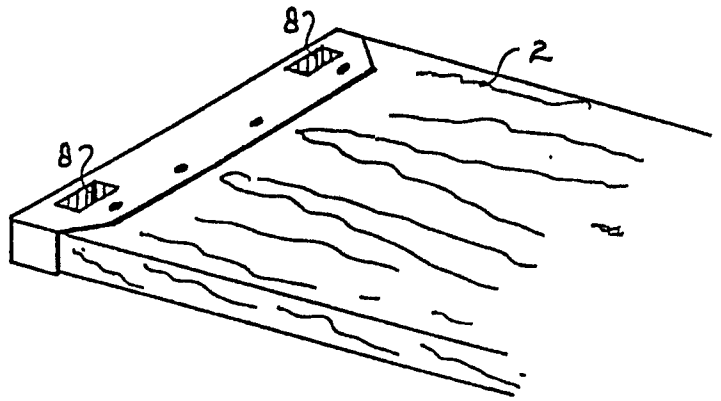
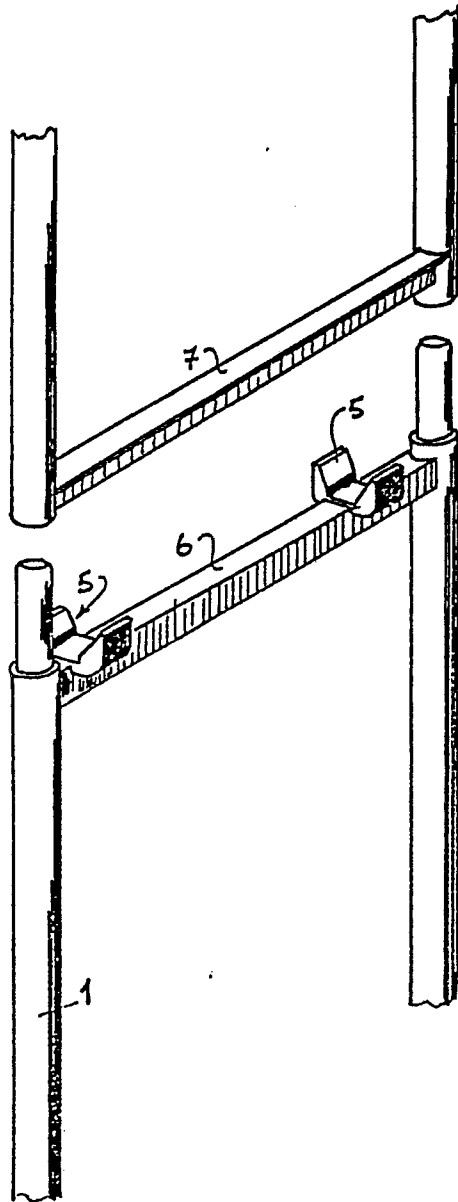
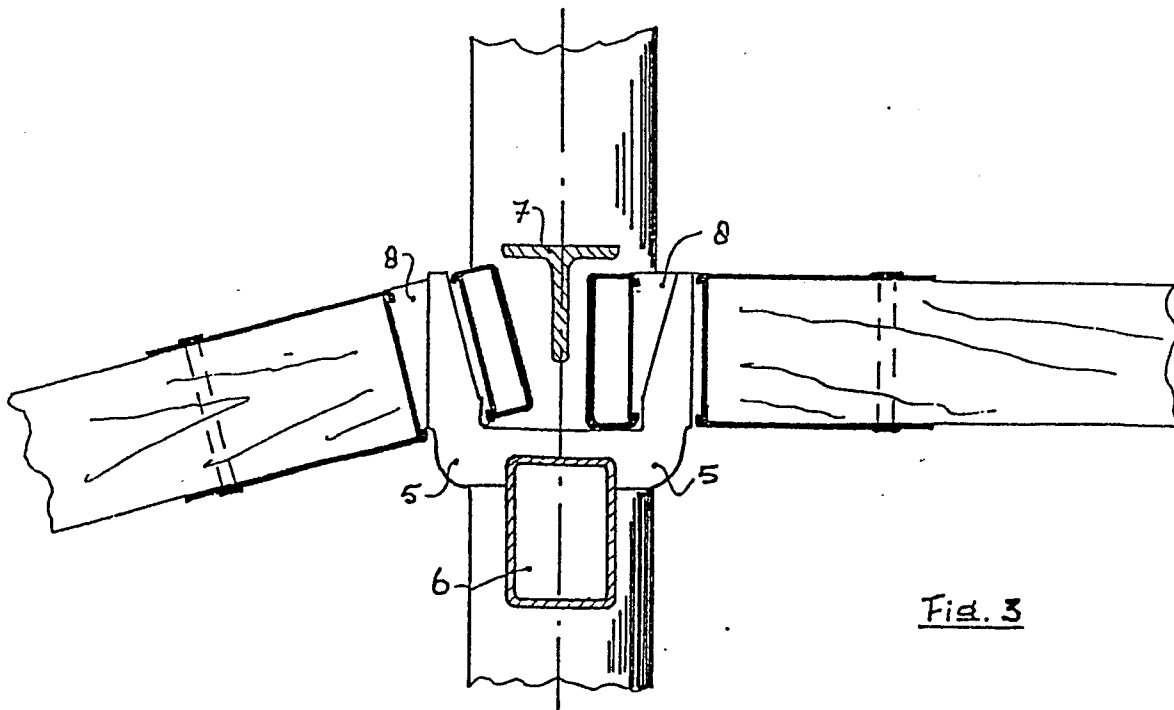


Fig. 1

Fig. 2Fig. 3

