

Title:

SCAFFOLDING SYSTEM COMPRISING A  
SCAFFOLDING ELEMENT AND METHOD FOR  
ERECTING A SCAFFOLDING SYSTEM

Description

Technical Field

The invention concerns a scaffolding system with a scaffolding element, and a method for erecting a scaffolding system.

In the construction field, it is necessary to carry out work at different heights. For this many different scaffolding elements are available which can be arranged above each other into a scaffolding system, so that by arranging different scaffolding elements above each other, different working heights or positions can be reached. Such scaffolding systems are particularly useful when erecting or dismantling ceiling shuttering systems. Furthermore such scaffolding systems are used to relieve the load on such shuttering.

Prior Art

Scaffolding elements are known from the prior art but these scaffolding systems have the disadvantage that often a combination of different scaffolding elements with working positions at different heights is required in order to set approximately the ideal working position.

Furthermore the passage height between scaffolding elements erected on top of each other, in particular because of the height of the individual scaffolding elements, is

sometimes less than 1.8 m, whereby persons can pass underneath only when stooping and the risk of accident from collision with crossbars increases.

EP 0 014 623 A1 discloses a scaffolding system in which the floor height which defines the working position is fixedly prespecified.

DE 1 740 990 U discloses a scaffolding element in which a horizontally arranged longitudinal tube can be placed in a vertically mobile support shell and secured there by means of a screw bolt.

#### Description of the Invention

The invention is based on the object of creating a scaffolding system which solves the problems known from the prior art and furthermore has a simple structure. Furthermore this advantage is achieved by a method for erecting a scaffolding system and by a use of the scaffolding system.

The object is achieved firstly by the scaffolding system described in claim 1.

According to this, the scaffolding system has at least two scaffolding elements which comprise two supports arranged substantially parallel to each other and at least two stiffening elements to stiffen the parallel support arrangement, wherein the scaffolding element comprises exactly one transverse connecting element which is attached between and connects the supports, and wherein the stiffening elements are arranged on the transverse connecting element. In use, the supports are erected vertical to the ground and all elements of a scaffolding element, i.e. the supports, the stiffening elements and the transverse connecting element, lie substantially in one plane. In a preferred use, two or more scaffolding elements are arranged behind each other in parallel planes and stabilised by lateral stiffening or "bracing" between the scaffolding elements so as to prevent tipping of the scaffolding elements.

Thus with one scaffolding element it is advantageously possible to provide a stable scaffolding system which only has one transverse connecting element. By fitting the stiffening elements to the transverse connecting element it is furthermore possible to provide a particularly stable scaffolding element in which the stiffening elements do not span the scaffolding element between the two supports and do not cross, but in which the stiffening elements extend merely from the support to the transverse connecting element.

Hence particularly advantageously a substantially barrier-free passage is provided between scaffolding elements arranged behind each other, as only one transverse connecting element is present and the stiffening is provided at the side. With the scaffolding element according to the invention it is furthermore possible, with a high stability of the scaffolding element, to use less material for the stiffening elements and hence save costs and weight. Furthermore because of the weight saving, ergonomic handling is possible of the scaffolding elements according to the invention on erection and dismantling.

The transverse connecting element is arranged asymmetrically in the longitudinal extension direction of the support. In this way it is possible, by placing identical scaffolding elements upside down, to arrange the transverse connecting element at different heights according to requirements and achieve particularly high passages between scaffolding elements arranged above each other.

The scaffolding elements can furthermore be arranged above each other in a scaffolding system. To connect the scaffolding elements, it has proved particularly advantageous to provide at least one support end with at least one orifice in which a connecting element can be fitted. In this way it is possible, particularly advantageously, to arrange above each other and connect several scaffolding elements with differently oriented, asymmetrically arranged transverse connecting elements.

According to a development, it is provided that the stiffening elements are arranged such that a passage is created between the application points of the stiffening elements at the transverse connecting element. Thus it is possible particularly advantageously, when arranging several scaffolding elements behind each other, to provide a barrier-free passage between the scaffolding elements. At the end of such a passage, i.e. at the foremost and/or rearmost scaffolding element, a safety element can be provided, in particular a railing. Here it is possible to attach the safety element to the transverse connecting elements or supports in an easily detachable manner. Thus it is possible particularly advantageously to prevent persons or objects from falling.

As already stated, a scaffolding system is erected by arranging several scaffolding elements above each other. Here it is possible particularly advantageously to vary the working height and the passage height between the individual scaffolding elements in that the asymmetrically arranged transverse connecting element is placed in the area of the upper or lower half accordingly.

According to a particularly preferred embodiment, a walkable support surface can be arranged between two transverse connecting elements, arranged substantially parallel to the ground, of two scaffolding elements. In this way, it is possible particularly advantageously to provide a surface on which people can stand or tools can be placed.

The object on which the invention is based is furthermore achieved by a method for erecting a scaffolding system in which initially a first scaffolding element is erected with two supports and an asymmetrically arranged transverse connecting element, adjacent to which between the supports are a large and a small passage area. Then a second scaffolding element which has two supports and an asymmetrically arranged transverse connecting element, adjacent to which between the supports are a large and a small passage area, is connected to the first scaffolding element, wherein the second scaffolding element has a different orientation of the asymmetrical transverse connecting element from the first scaffolding element so that the two large passage areas are adjacent to each other. Alternatively it is also possible to arrange the two small passage areas adjacent to each other. These two steps can be repeated as often as required until a scaffolding system has been erected to the desired height, wherein it need not be stated that when arranging the third scaffolding element over the second, it is only possible to arrange two small passage areas adjacent to each other or one small and one large passage area next to each other. In this way in any case it is advantageously possible to erect a scaffolding system in which, by suitable arrangement of asymmetrically arranged transverse connecting elements, an ideal working height or working position can be achieved.

Furthermore the advantages of the invention are shown in the use of a scaffolding system according to claim 7.

#### Brief description of the drawings

The invention is described below in more detail with reference to the example shown in the drawings. These show:

Fig. 1 a top view of two scaffolding elements arranged above each other into a scaffolding system;

Fig. 2 a connecting element to connect two scaffolding elements; and

Fig. 3 a further embodiment of a scaffolding element according to the invention.

### Detailed description of preferred embodiments of the invention

Fig. 1 shows two scaffolding elements 10 arranged above each other into a scaffolding system 20, wherein the scaffolding elements 10 each have two parallel supports 12. The supports 12 are joined together with a transverse connecting element 16, wherein the transverse connecting element 16 in the embodiment shown is arranged asymmetrically in the longitudinal extension direction of the support 12, i.e. in the "upper" or "lower" half of the support 12. Two supports 12 arranged above each other are joined together via a connecting element 24 not shown in fig. 1.

From the support 12, stiffening elements 14 extend at an angle to the transverse connecting element 16. In this way the stiffness of the scaffolding element is increased. One stiffening element 14 extends from an area above the transverse connecting element 16 at an angle from each support 12 to the transverse connecting element 16, and one stiffening element 14 extends from an area below the transverse connecting element 16 at an angle from each support 12 to the transverse connecting element 16.

The stiffening elements 14 are welded to the transverse connecting element 16 and the support 12. Alternative fixing forms e.g. by screwing, riveting or similar, are also possible.

As fig. 1 shows, several scaffolding elements 10 can be arranged above each other into a scaffolding system 20. In particular with an asymmetrically arranged transverse connecting element 16, it is possible to arrange two scaffolding elements 10 above each other so that with identical scaffolding elements 10, the transverse connecting element 16 is oriented differently. This is achieved by arranging scaffolding elements 10 inverted above each other. In this way it is possible to create a large or a small or a medium passage area between two adjacent scaffolding elements 10 as required. The large passage area is created by arranging scaffolding elements 10 above each other so that the large passage areas of the scaffolding elements 10 are adjacent to each other. A small passage area can be created between the scaffolding elements 10 in a scaffolding system 20 by arranging scaffolding elements 10 above each other so that the small passage areas are adjacent to each other. A medium passage area between the scaffolding elements 10 of the scaffolding system 20 can be created by arranging scaffolding elements 10 above each other with the same orientation of the asymmetrically arranged transverse connecting elements 16.

Furthermore a walkable support surface can be arranged between two scaffolding elements 10 arranged substantially behind each other. The support surface is held on the transverse connecting element 16 so that the support surface is held securely, to be walkable, in both arrangement orientations of the scaffolding element 10.

By arranging several scaffolding elements above and/or behind each other, it is possible to provide a scaffolding system in which different passage heights (small, medium, large) can be created between the scaffolding elements arranged above each other.

To ensure great flexibility in the working and passage heights which can be achieved, compatible scaffolding elements 10 of different heights are possible. For example, scaffolding elements 10 with a height of around 1.8 m, 1.2 m or 0.9 m are possible, wherein the transverse connecting element 16 in each case is arranged correspondingly asymmetrically, preferably at around one-third of the height of the supports 12. Thus for example by arranging two 1.8 m high supports with differently oriented transverse connecting elements above each other (large passage area), a passage height of over 2 m is achieved as the height of the transverse connecting elements 16 must be subtracted from the theoretical passage height of 2.4 m ( $2 \times 1.2$  m).

A safety element, in particular a railing, is arranged detachably at the end of a passage between the stiffening elements 14 or supports 12 to prevent injury. For the safety element, a fixing point is provided on both sides of the transverse connecting element 16 at the stiffening element 14 and/or at the support 12. If the safety element is arranged on the stiffening element 14, it must be ensured that its length is adjustable so that it can be attached to the stiffening element 14 on both sides of the transverse connecting element 16.

In a scaffolding system 20 with scaffolding elements 10 arranged above each other, to attach the scaffolding elements arranged above each other, a connecting element is arranged between two scaffolding elements 10.

Fig. 2 shows an example of such a connecting element 24. The connecting element 24 is inserted in the supports 12 of preferably round cross-section until it meets an insertion limiter 28 which has a diameter greater than that of the supports 12, and a locking device 26 engages in a locking recess formed on the support 12. The scaffolding element 10 to be arranged on the scaffolding element 10 fitted with the connecting element 24 is connected with the connecting element 24 in a similar manner. This ensures the flexible

arrangement of the scaffolding elements 10 above each other into a scaffolding system 20.

Alternative fixings are also possible between the support 12 and the connecting element 24. Thus the connecting element 24 can be locked or fastened to the support 12 for example by means of a push bolt, a linch pin, a clip element or similar.

The ends of the supports 12 or connecting elements 24 are dimensioned such that spindles arranged on the ground to compensate for the heights of the supports can be screwed into both the supports 12 and the connecting elements 24. In this way a scaffolding element can be erected on uneven ground and the height adjusted precisely. Such spindles are available in the building trade.

Fig. 3 shows a further embodiment of a scaffolding element 10 according to the invention, wherein the same or similar elements are designated with the same reference numerals. Fig. 3 shows a scaffolding element 10, the supports 12 of which have a longitudinal extension of less than 1.4 m, preferably around 0.9 m or 1.2 m. In this scaffolding element 10, it has proved advantageous to provide only one stiffening element 14, similar to that described in fig. 1, on each support 12. With the transverse connecting element 16 arranged asymmetrically, this is preferably provided on the side of the transverse connecting element 16 on which the longer part of the support 12 extends. The embodiment in fig. 3 can however also have two stiffening elements on each side.

Alternatively in all embodiments it is possible to arrange the stiffening element 14 below the transverse connecting element 16 on one support 12 of the scaffolding element 10 and above the transverse connecting element 16 on the other support 12.

### Claims

1. Scaffolding system with several scaffolding elements, wherein one scaffolding element comprises

two supports arranged substantially parallel to each other, and

at least two stiffening elements to stiffen the parallel support arrangement,

wherein

the scaffolding element has exactly one transverse connecting element, wherein the transverse connecting element is attached between and connects the supports ,

the stiffening elements are furthermore arranged on the transverse connecting element, and

the transverse connecting element is arranged asymmetrically in the longitudinal extension of the supports, characterised in that

at least two scaffolding elements with differently oriented transverse connecting elements can be arranged above each other in the usage state of the scaffolding system composed of the scaffolding elements,

wherein at least two scaffolding elements have different heights.

2. Scaffolding system according to claim 1, characterised in that at least one support at least at one end comprises an orifice to receive a connecting element.

3. Scaffolding system according to claim 1 or 2, characterised in that the stiffening elements are arranged so that a passage is created between the attachment points of the stiffening elements on the transverse connecting element.

4. Scaffolding system according to any of the preceding claims, characterised in that between the stiffening elements and/or the supports can be arranged a safety element, in particular a railing.

5. Scaffolding system according to any of the preceding claims, characterised in that a walkable support surface can be arranged between two transverse connecting elements, arranged substantially parallel to the ground, of two scaffolding elements.

6. Method for erecting a scaffolding system, in particular according to any of claims 1 to 5, comprising the following steps:

a) erection of a first scaffolding element with two supports and an asymmetrically arranged transverse connecting element, adjacent to which between the supports are a large and a small passage area,

b) connection of a second scaffolding element comprising two supports and an asymmetrically arranged transverse connecting element, adjacent to which between the supports are a large and a small passage area, to the first scaffolding element,

characterised in that the second scaffolding element in relation to the first scaffolding element has a different orientation of the asymmetrical transverse connecting element so that the two large passage areas are adjacent to each other,

c) repeat of steps a) and b).

7. Use of a scaffolding system with a plurality of scaffolding elements according to any of claims 1 to 5,

characterised in that

at least two scaffolding elements with differently oriented transverse connecting elements are arranged above each other in the usage state.