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(54) Specific modular scaffold system

(57) The invention relates to a modular scaffold system (1), in which the posts (2) are provided with rosettes (3) approximately every 500 mm for coupling a horizontal tube shaped joist element (4, 12) onto it and according to the invention the stroke height H of the scaffold is approximately 3000 mm and the anchorage pattern (9) onto the exterior wall of the engineering structure per storey in horizontal sense is not constructed at every position of each post, in which in order to make this possible per storey in the modular scaffold system (1), specially recessed stiffened diagonals (13) are mounted in frame work shape, in which, for the mason (15) of the exterior wall (11) in horizontal and in vertical sense adjustable specific brackets (10) and a small attachment scaffold (14) are applied, through which in a surprisingly way the legal lifting standards for the mason (15) can be met every time.

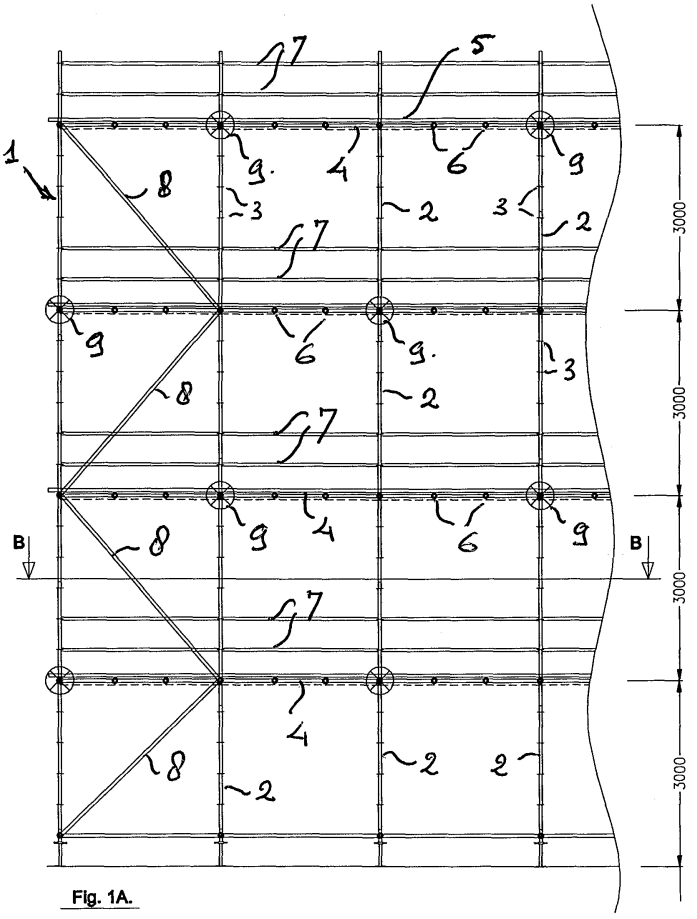

Fig. 1A.

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Description

[0001] The present invention relates to a modular scaffold system, being a spacial supporting framework with mainly vertical and horizontal supporting elements of tubes, in which the vertical supporting elements, being the posts, are supplied with so called rosettes along the longitudinal axis of it at distances of approximately half a meter for connection of the mentioned horizontal supporting elements, in which the mentioned scaffold system is mostly placed in front of exterior walls of engineering structures to be finished, in which the engineering structures are mostly bearing framed structures with several floors and with a height between floors at stroke height H, in which the scaffold system is placed at a short distance from the bearing framed structure of the building or buildings and in which the mentioned short distance or interspace is bridged with brackets, on which mostly horizontal floor elements are applied at stroke height H and in which further facilities can be applied for the work level and the supply of building bricks and mortar for the mason.

[0002] It is known, that scaffold systems follow the raising of engineering structures with several floors and with that serve as a safety device of the building units for bypass of the construction workers from one unit to the other and making the supply of building material possible. Also, the scaffold construction is used to finish the exterior walls, which usually involves an extensive exterior masonry.

[0003] The scaffold system is traditionally constructed of pipes or tubes in order to form a spacial construction, consisting of vertical posts with in between horizontal joists. For that, the vertical posts and the horizontal joists are interconnected with special couplings. On the transverse horizontal joists, mostly at floor level, floor parts, batter boards or floor elements are mounted. To construct the above mentioned traditional scaffolding a lot of work and skill is necessary. In a later stage, in order to build the scaffold against an exterior wall of an engineering structure faster, a so called scaffold system is developed, in which around the tube-shaped vertical posts rosettes are applied every 500 mm, to which the horizontal connecting element, mostly with cottering, can be coupled. The mentioned rosettes consist of disc-shaped flanges with radial around the circumference connection holes for the cottering. This is, for example, described in patent document US 4 603 756, submitted 20-07-1984 by LAYHER, Ulrich, Im Lailen 16, D-7129, Guglingen-Elbensbach, Germany. This patent document clearly shows, drawn in oblique projection, the construction of a modular scaffold system. With the above mentioned scaffold construction story heights of 2500 mm can be well reached every time, in which the scaffold, on every junction of post and horizontal joists (also mostly tubes), must be anchored to the exterior wall of the engineering structure or the framed structure.

[0004] The anchors are known e.g. from the German Offenlegungschrift DE 196 45 671 A1 from LAYHER, Georg, 74336 Brechenheim, Germany, submitted 06-11-1998 and titled: "Wandverankerungs-Hilfsvorrichtung aus Metall". The device consists of a tube-shaped fixing arm with on the end a welded hanging pin, which falls into a plugged in anchoring threaded end on the exterior wall. The vertical tube-shaped posts, for example, can be connected in vertical sense with a usual welded in pin in the end of the tube-shaped post.

[0005] The floor height of home and office buildings with several storeys has been lifted to 2700 mm over the years, for which tube-shaped posts with rosette distances of 540 mm are developed and in which the anchorage of every junction of vertical posts and horizontal joists were still necessary and just enough. In the Dutch Construction Regulations one assumes a storey height (= the distance between the upper side of the floor up to the upper side of the next floor) of approximately 3000 mm. The anchorage pattern must stay the same, but the scaffold becomes too slack so that other developments must be made. At each 3,00 x 2,50 = 7,50 m^2 exterior wall an anchorage of the scaffold to the exterior wall must be done. This is very costly due to the time needed and material used, in which it must also be noted that placement of the anchorage at the required positions is not always possible. The conclusions are that the number of costly anchorages on the exterior wall of the engineering structures should be strongly limited, for example, from an anchorage per approximately 7,50 m^2 exterior wall to an anchorage per approximately 15 m^2 exterior wall. This due to the high costs and the occurring delay when mounting the modular scaffold system.

[0006] The known modular scaffold systems have disadvantages with regard to the high costs by applying the large number of anchorages and by enlarging the storey height this modular scaffold has less bearing capacity. Further, the modular scaffold system must especially be usable for the mason of an exterior wall, in which the lifting standard with regard to the working conditions of the mason must be watched. The lifting standard indicates a masonry height of 200 mm above the working surface till 200 + 1500 = 1700 mm above the same working surface. For this, special facilities must be applied to the modular scaffold system with regard to the supply of goods and the work level of the mason or bricklayer. Also a disadvantage of the known modular scaffold system is, that the mentioned specific facilities for the mason are missing or are not constructed with the known brackets and such.

[0007] It is the aim of the present invention to provide such a modified and improved specific modular scaffold system, in which the aforementioned disadvantages are solved and in which modular scaffold system can be put onto the market in an efficient and economic responsible way. For this, a modular scaffold system according to the invention is further developed and/or modified in a very inventive way, characterized in that, the mentioned stroke height H is approximately 3000 mm, in which also

the mentioned anchorage pattern of the posts on the exterior wall for every floor in a horizontal sense is not constructed at the position of each post, in which at floor height or stroke height H also at the position of the mentioned rosettes of the poles, specific stiffening diagonals are mounted in framework form.

[0008] The advantage is, that the number of expensive anchorages on the exterior wall of the engineering structure can be strongly limited, so that the modular scaffold system can be set up much faster and is supplied with rigid framework-shaped horizontal connections, in which the mentioned modular scaffold system can also be attached along several buildings standing in a row. It also occurs, that the posts of the modular scaffold system cannot be attached at a certain storey height of the engineering structure over a number of units or specific exterior wall construction, through which the arisen horizontal framework connection per storey can then give a solution.

[0009] Further, the device according to the invention is further developed in such a way, that the mentioned specific stiffening diagonals is constructed recessed and to which end elements are applied at the ends of the scaffold tubes to provide an undisturbed passage to the upper floor elements or steel floor platforms or to intermediate scaffolding poles to be applied with scaffolding deals attached onto that, in which the mentioned end elements consist of a stiffened rhombic profile with cottering welded to the scaffold tube in order to transmit horizontal forces and with that acting moments over a height of approximately 80 mm onto mentioned stiffening diagonal.

[0010] The advantages are that whatever floor elements one chooses, no hinder is experienced from the specific stiffening diagonals and that the horizontal work of force in the modular scaffold system can be passed on to vertical connections and the exterior wall of the engineering structure in a mechanically very suitable way.

[0011] Further, the device according to the invention is further developed in such a way, that the mentioned facilities for the mason or bricklayer consists of specific coupling brackets on the rosettes of the posts of the scaffold system, which are adjustable in relation to its suspension both in horizontal and especially in vertical sense over respectively a length L1 and L2, on which corresponding floor elements are applied and the facilities for supplying the mason or bricklayer consist of a small attachment scaffold to be mounted to the scaffold floor per storey, in which the mentioned small attachment scaffold has a maximum height of approximately 1000 mm and that it consists of trestles with scaffold deals, which small attachment scaffold can, if necessary, be coupled to the mentioned posts.

[0012] The advantages are, that every time the mason can be supplied in an efficient way and according to the rules for working conditions and even according to the lifting standards and can do his masonry on the exterior wall. For the different dimensions, see figures 2A, 2B and 2C.

[0013] The preferred construction of the invention will be described by way of example, and with reference to the accompanying drawing.

[0014] In which:

Fig. 1A and 1B shows a front view (fig. 1A) and a cross-section over the line B-B (fig. 1B) of the specific modular scaffold system according to a preferred embodiment of the invention;

Fig. 2A, 2B and 2C show a side view (figure 2A) of the specific modular scaffold system of figure 1A and two positions of the facilities for the masons' work platform in figures 2B and 2C according to a preferred embodiment of the invention;

Fig. 4A and 4B show a top view of the end element of the specific stiffening diagonal with scaffolding deal (figure 4A) and a side view concerning the end element on the vertical post of the modular scaffold system according to a preferred embodiment of the invention (fig. 4B); and

Fig. 5A and 5B show a side view of the specific coupling bracket of the rosettes of the post of the scaffold system, which is adjustable in horizontal as well as in vertical sense (fig. 5A) and a top view of the mentioned coupling bracket according to the invention.

[0015] Figure 1A shows a front view of the specific modular scaffold system 1 according to a preferred embodiment of the invention. The modular scaffold system 1 consists of the vertical posts 2 supplied with rosettes 3, onto which the horizontal joists 4 are mounted with, for example, the scaffolding pole 6 for the scaffolding deals 5. Further, for safety reasons, a guardrail 7 is coupled to the rosettes 3 or mounted with cottering. The outer plate shores 8 have been applied in the vertical plate for vertical discharge of horizontal forces. The anchorages 9 on the exterior wall of the engineering structure are to be fixed according to a preferred pattern in horizontal sense and in vertical sense by the suitable framework construction of the stiffening diagonals 13.

[0016] Figure 1B shows a cross-section over the line B-B of figure 1A. Here, the specific coupling brackets 10 for connection to the exterior wall 11 of the engineering framed structure are indicated. Also the scaffolding poles 6, the horizontal joist tubes 12 and the specific stiffening diagonals 13 are shown.

[0017] Figures 2A up to 2C show a side view of the specific modular scaffold system 1 to show the use as a mason scaffold with the specific coupling brackets 10 and the small attachment scaffold 14. The mason 15 may only build from a height of 200 mm to a height of approximately 1700 mm.

[0018] Figures 2B and 2C show the specific coupling bracket 10 adjusted in horizontal and in vertical sense to meet the above mentioned lifting standard. The horizontal adjustment is approximately 200 mm and the vertical

adjustment is approximately 250 mm, through which every time rosettes 3 can be used to the posts 2 of the modular scaffold system 1. Onto the small attachment scaffold 14 the mortar tub 16 is placed and can be filled with mortar from the scaffolding deals by the foreman (not indicated).

[0019] Figure 3A shows enlarged in top view the specific stiffening diagonal 13 according to the invention placed in the modular scaffold system.

[0020] Figure 3B shows an overall view in oblique projection of the specific stiffing diagonal 13, which consists of a scaffolding tube with special developed end element 17 for a recessed position of it beneath the scaffolding poles 13. Arrow X refers from figure 3A to figure 3B.

[0021] Figure 4A shows a top view of the mentioned end elements 17, which with a known cottering 18 is connected to the rosette 3 of the aforementioned post 2.

[0022] Figure 4B shows a side view of it. The connection of the stiffening diagonal 13 is done by the necessary vertical recede over approximately 80 mm with the aid of a rhombic profile 19 in cross-section, which is welded to the cottering 18 on one side and to the stiffening diagonal 13 on the other side, in which the rhombic profile 19 can be further reinforced for the occurring work of force. The mentioned rhombic shape is necessary to undisturbedly apply the scaffolding deals and/or floor elements.

[0023] Figure 5A shows a side view of the specific in horizontal and in vertical sense adjustable bracket 10 coupled onto the rosettes 3 of the post 2. A drawn line indicates the adjustable coupling bracket 10, the maximum and vertical and horizontally adjusted shape at point of departure and in dotted line. Here, the rosette distance is, as usual, approximately 500 mm, and the maximum vertical adjustability is approximately 250 mm, while the horizontal adjustability is approximately 200 mm. This is all shown in mm in figure 5A.

[0024] In figure 5B this and that is shown in top view for further explanation. The locking of a certain horizontal or vertical position of the adjusted bracket 10 is done with a pin through a bore construction. The mounting of the bracket 10, which is adjustable in horizontal and in vertical direction onto the rosettes 3 of the post 2 can be done with the mentioned cottering 18.

[0025] Finally it has to be emphasized, that the above description constitutes a preferred embodiment of the present invention and that further variations and modifications are still possible without departing the scope of this patent description.

Claims

1. Modular scaffold system (1), being a spacial supporting framework with mainly vertical and horizontal supporting elements of tubes, in which the vertical supporting elements, being the posts (2), are supplied with so called rosettes (3) along the longitudinal axis of it at distances of approximately half a meter for connection of the mentioned horizontal supporting elements (4, 12), in which the mentioned scaffold system is mostly placed in front of exterior walls (11) of engineering structures to be finished, in which the engineering structures are mostly bearing framed structures with several floors and with a height between floors at stroke height H, in which the scaffold system is placed at a short distance from the bearing framed structure of the building or buildings and in which the mentioned short distance or interspace is bridged with brackets (10), on which mostly horizontal floor elements are applied at stroke height H and in which further facilities can be applied for the work level and the supply of building bricks and mortar for the mason (15), **characterized in that**, the mentioned stroke height H is approximately 3000 mm, in which also the mentioned anchorage pattern (9) of the posts (2) on the exterior wall (11) per floor in horizontal sense is not constructed at the position of each post, in which at floor height or stroke height H also at the position of the mentioned rosettes (3) of the poles (2) specific stiffening diagonals (13) are mounted in framework form.

2. Modular scaffold system (1) as claimed in claim 1, **characterized in that**, the mentioned specific stiffening diagonals (13) is constructed recessed and to which end elements (17) are applied at the ends of the scaffold tubes to provide an undisturbed passage to upper floor elements or steel floor platforms or to intermediate scaffolding poles (6) to be applied with scaffolding deals (5) attached onto that.

3. Modular scaffold system (1) as claimed in claim 2, **characterized in that**, the mentioned end elements (17) consist of a stiffened rhombic profile (19) with cottering (18) welded to the scaffold tube in order to transmit horizontal forces and with that acting moments over a height of approximately 80 mm onto mentioned stiffening diagonal (13).

4. Modular scaffold system (1) as claimed in claims 1 and 3, **characterized in that**, the mentioned pattern of stiffening diagonals (13) with the mentioned horizontal supporting elements (4, 12) in horizontal sense form a retaining form and rigid framework from anchorage to anchorage (9) of the posts (2) by coupling onto the rosettes (3) of the posts (2) at floor level of the bearing framed structure and in which the locking is done with the mentioned cottering (18).

5. Modular scaffold system (1) as claimed in aforementioned claims, **characterized in that**, the mentioned tubes are mostly steel scaffold tubes with an external dimension of 48,3 mm and a wall thickness of 3,2 mm.

6. Modular scaffold system (1) as claimed in claim 2,

characterized in that, the mentioned scaffolding deals (5) have a cross-section of 200 x 30 mm and a length of approximately 5 m and that the wooden or steel floor panels consist of cantilever plates with receding hook-shaped elements at the ends for placement and locking onto mentioned horizontal supporting element (12), so that the top side of the horizontal supporting elements (12) and the top side of the floor panels lie approximately in one surface.

7. Modular scaffold system (1) as claimed in claim 1, **characterized in that**, the mentioned facilities for the mason or bricklayer (15) consists of specific coupling brackets (10) on the rosettes (3) of the posts (2) of the scaffold system, which are adjustable in relation to its suspension both in horizontal and especially in vertical sense over respectively a length L1 and L2, on which corresponding floor elements are applied and the facilities for supplying the mason or bricklayer (15) consist of a small attachment scaffold (14) to be mounted to the scaffold floor per storey.

8. Modular scaffold system (1) as claimed in claims 1 and 7, **characterized in that**, the mentioned horizontal adjustability of the extendability of the specific coupling brackets (10) is between 100 and 400 mm, preferably approximately 200 mm.

9. Modular scaffold system (1) as claimed in claims 1, 5, 7 and 8, **characterized in that**, the mentioned vertical adjustability of the specific coupling brackets (10) is between 100 and 400 mm, preferably approximately 250 mm.

10. Modular scaffold system (1) as claimed in claims 1, 5, 6, 7, 8 and 9, **characterized in that** the mentioned small attachment scaffold (14) has a maximum height of approximately 1000 mm and that it consists of trestles with scaffold deals, which small attachment scaffold (14) can, if necessary, be coupled to the mentioned posts (2).

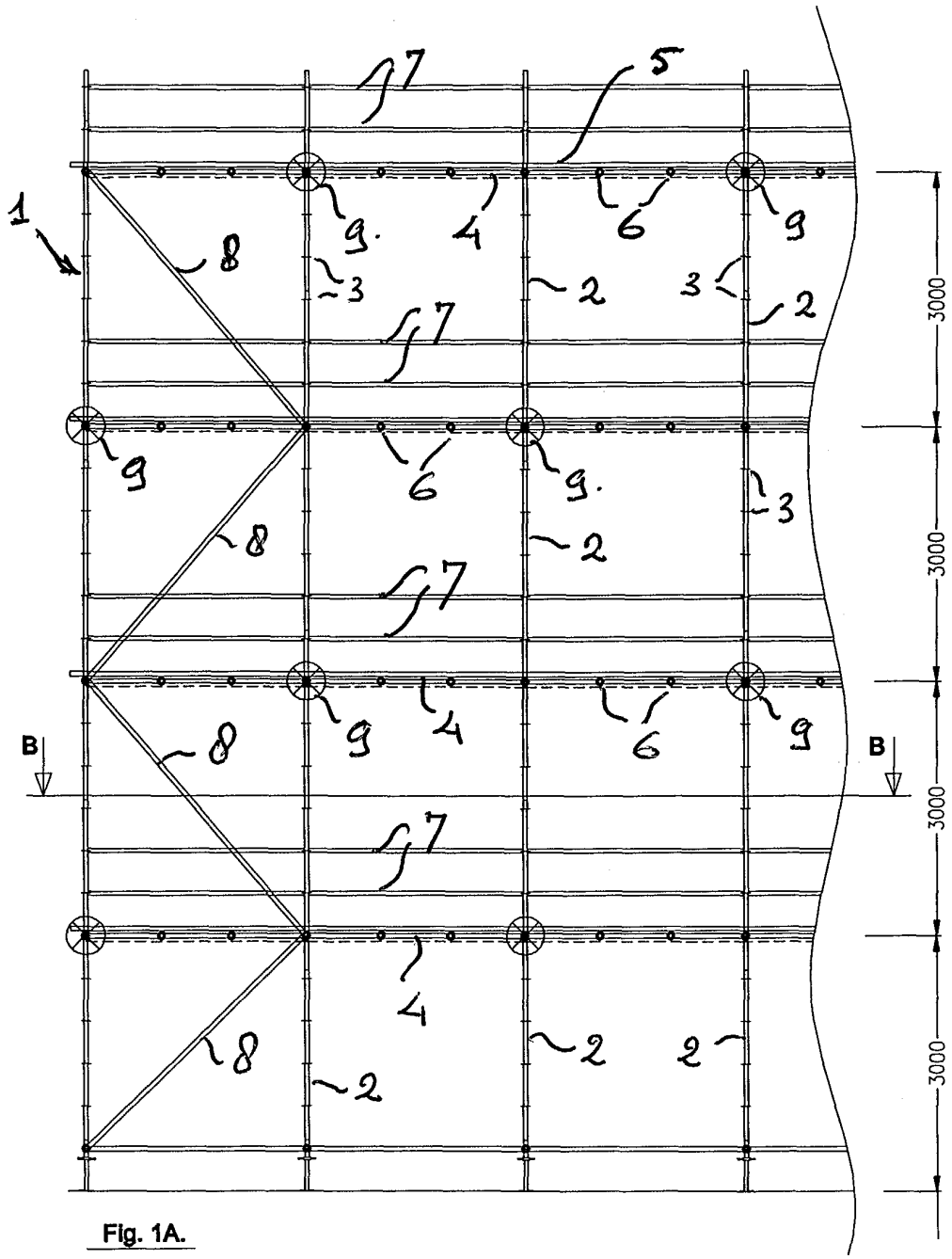
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Fig. 1A.

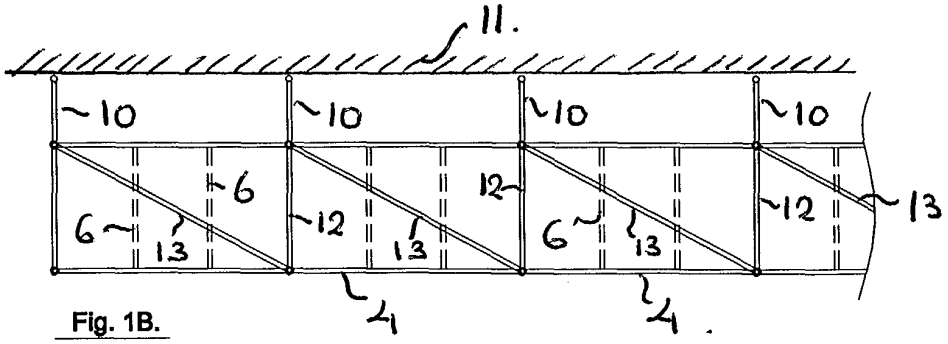
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Fig. 1B.

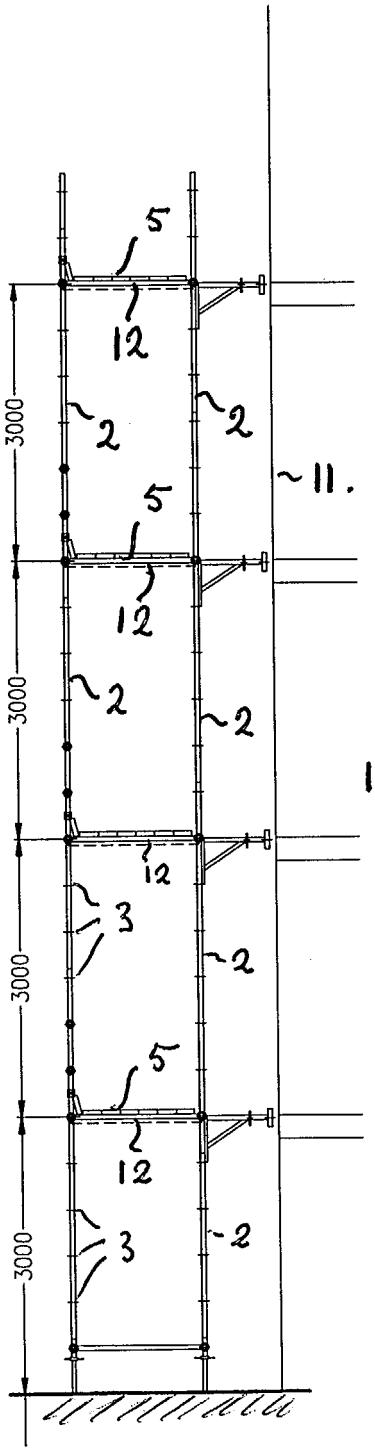
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Fig. 2A.

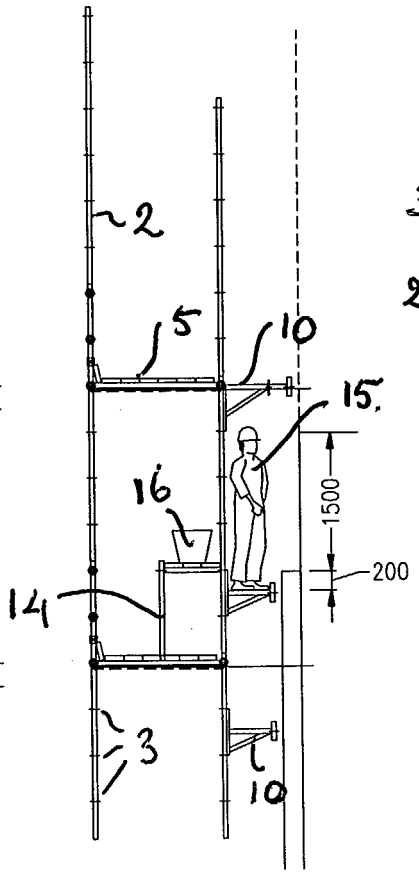
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Fig. 2B.

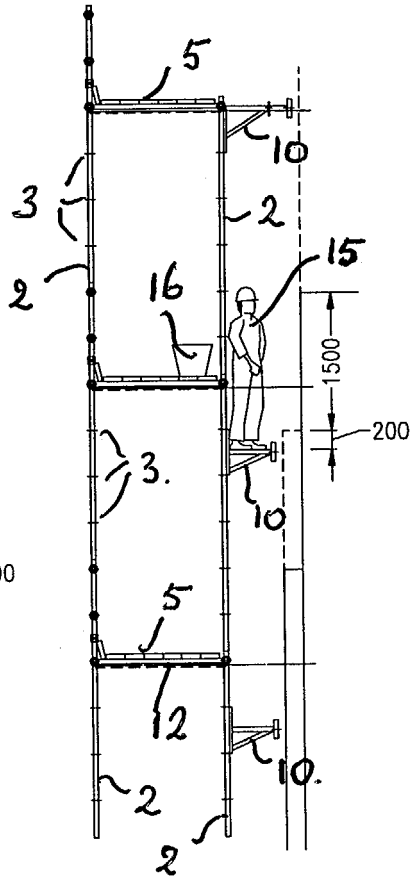
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Fig. 2C.

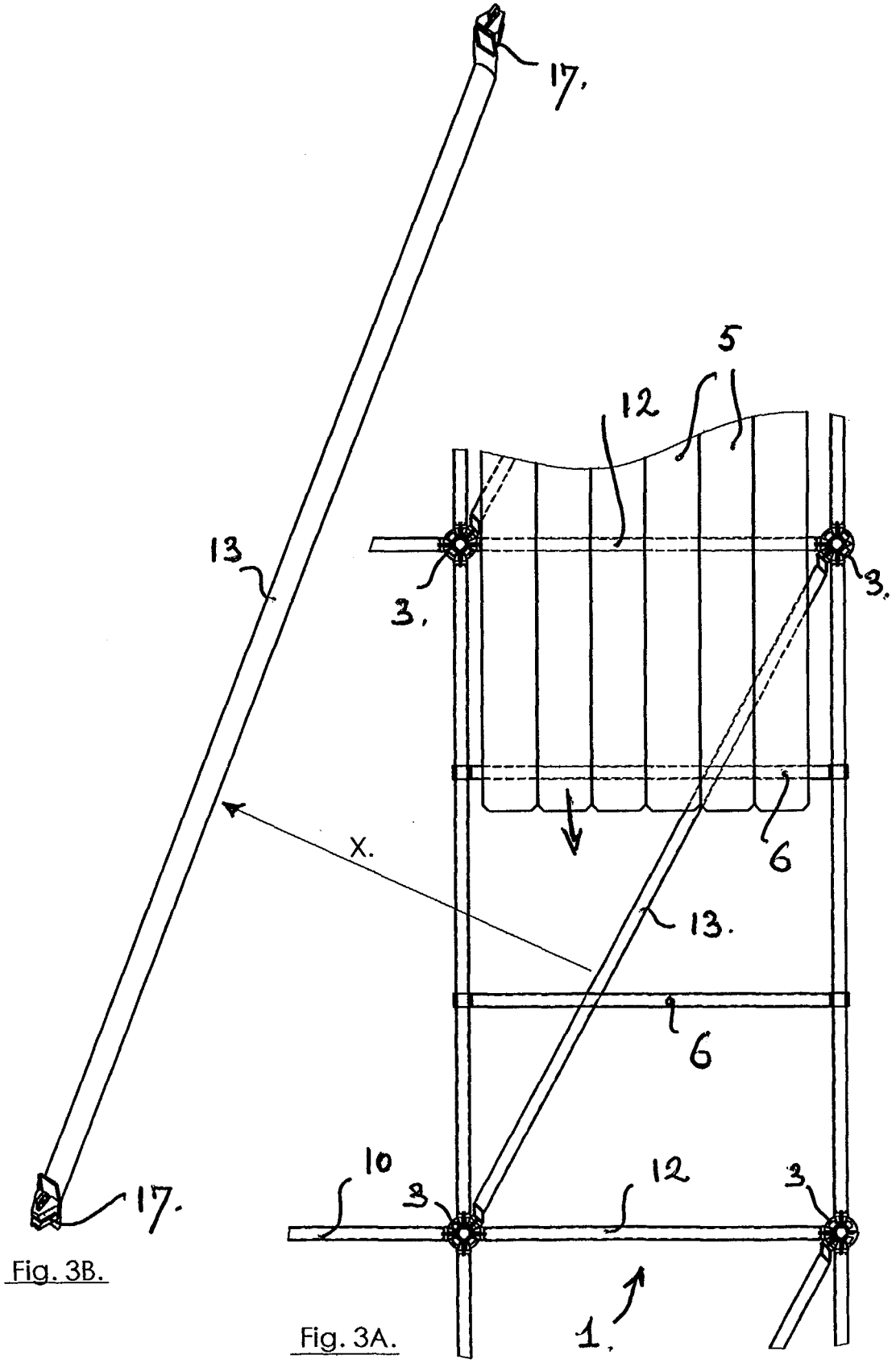

Fig. 3B.

Fig. 3A.

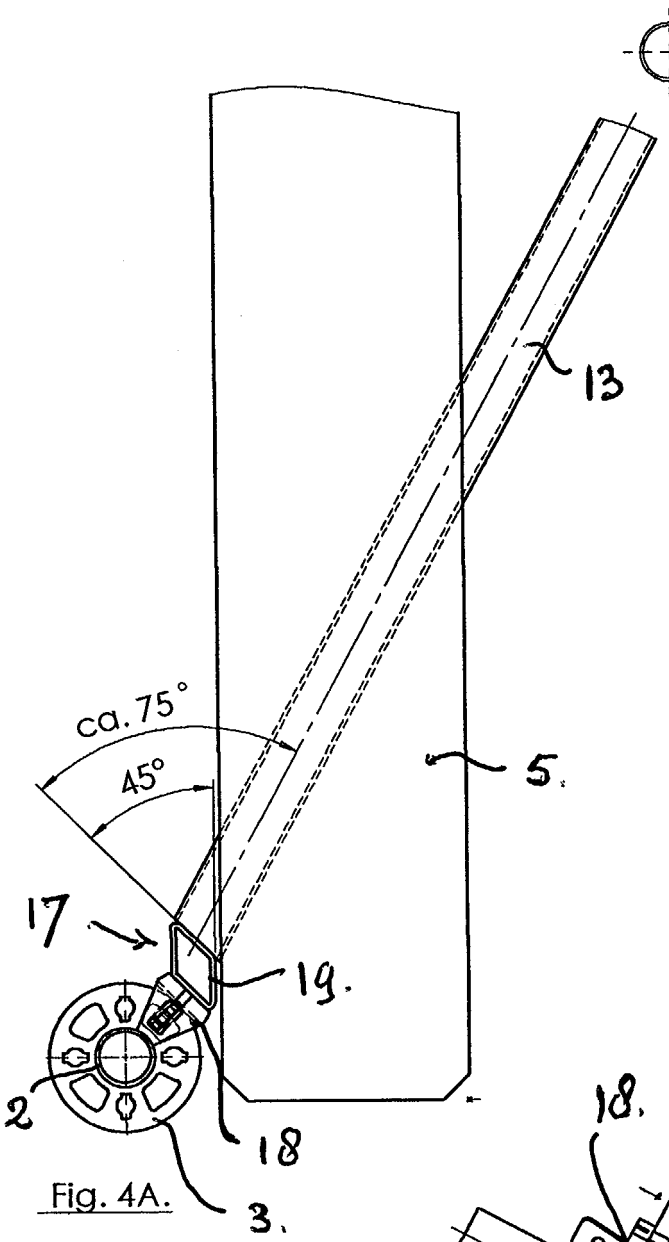

Fig. 4A.

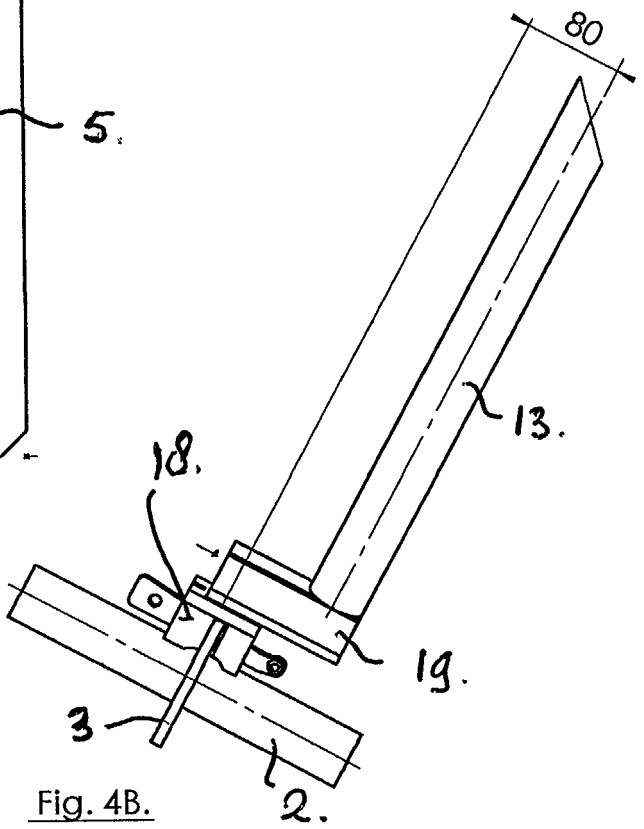

Fig. 4B.

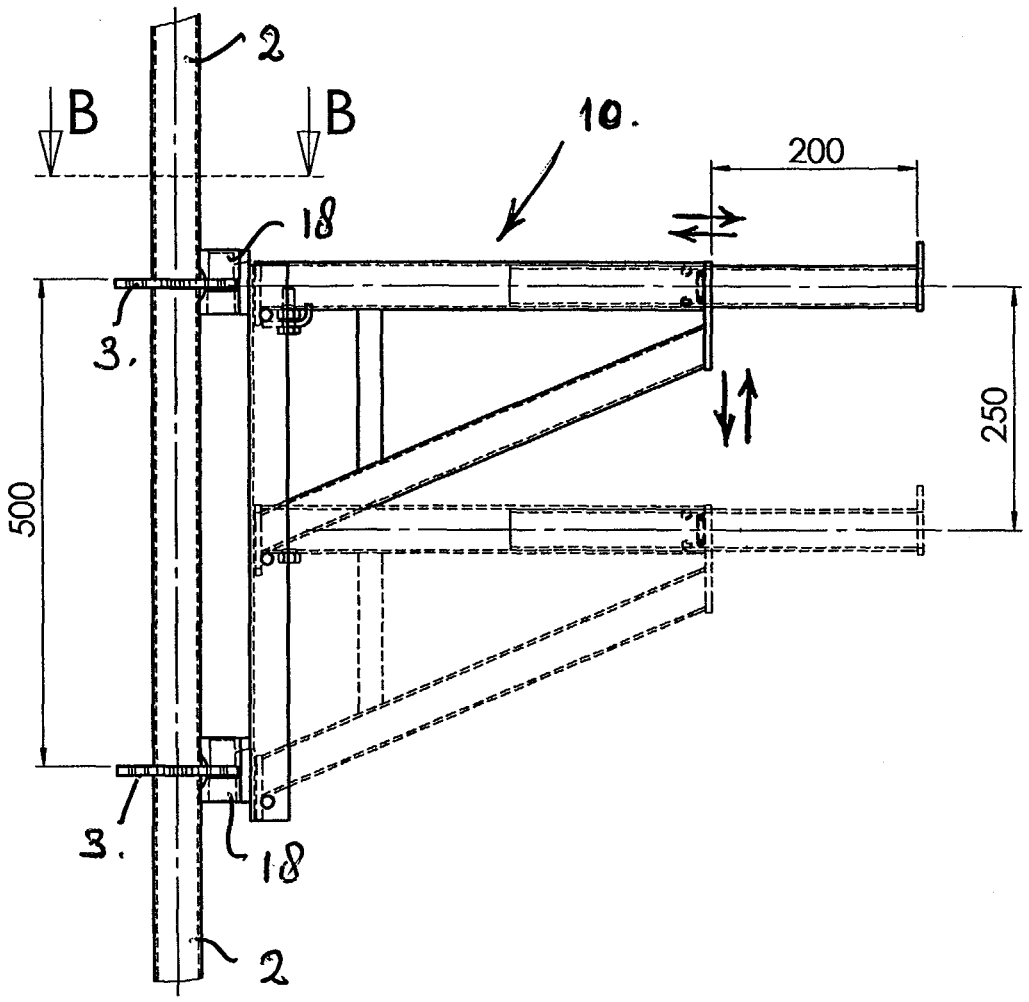

Fig. 5A.

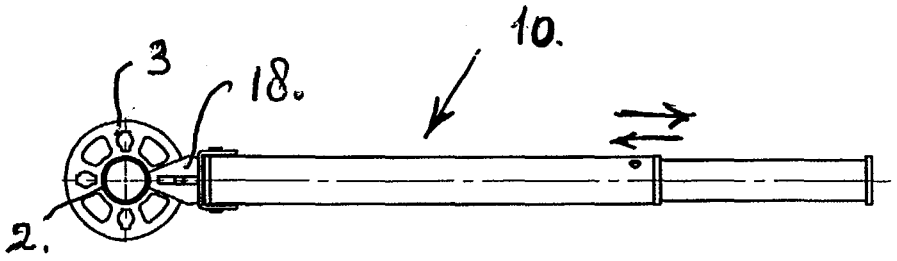

Fig. 5B.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 07 7246

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.7)
Y	MONTAGEHINWEISE FÜR DAS LAYHER ALLROUNDGERÜST, February 1999 (1999-02), XP002311693 Paragraph "Layher Allroundgerüst im AllroundEinsatz: Der Regelaufbau", Fig. [7]; Paragraph "Einsatz als Fassadengerüst"; Paragraph "Gerüstverankerung" - Ankerraster A.	1-10	E04G5/04
Y	LAYHER GERÜSTBAU-ZUBEHÖR, April 2001 (2001-04), page 6, XP002311694 Paragraph: "Gerüstrohre und Kupplungen - Allgemeiner Aus- und Weiterbau"	1-10	
A	NL 7 305 318 A (KWIKFORM LIMITED) 18 October 1974 (1974-10-18) * page 4, line 15 - page 5, line 4; figure 1 *	2,4	
A	DE 802 280 C (CHR BOSSERT G M B H) 8 February 1951 (1951-02-08) * page 2, lines 38-62; claims 1,2; figure 1 *	1,7	TECHNICAL FIELDS SEARCHED (Int.Cl.7) E04G
A	GB 2 112 440 A (ACROW) 20 July 1983 (1983-07-20) * abstract; figure 1 *	7-9	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	21 December 2004	Saretta, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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21-12-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
NL 7305318 A	18-10-1974	NONE	
DE 802280 C	08-02-1951	NONE	
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82