**Title:** WALL FORMWORK WITH OPTIONAL ANCHOR POINT

**Abstract:** The invention relates to a wall formwork (1) for concrete structures, comprising a basic body (18), an outer face configured as a formwork facing (6), and anchor points in the form of anchor holes (2, 3, 4, 5) for the detachable connection to other wall formworks. It is proposed that, in relation to the horizontal central axis (7) of the wall formwork (1), more anchor points be provided in the upper portion (8) of the wall formwork (1) than in the lower portion (9). Thus, the number of anchor rods to be used can be optimized.

**Fig. 1**
Wall Formwork with Optional Anchor Point

The invention relates to a wall formwork according to the preamble of claim 1, a wall formwork system equipped with such a wall formwork and a method for anchoring such a wall formwork.

A wall formwork within the sense of the present invention is used in formwork engineering for concrete structures, i.e. for concreting concrete or reinforced concrete structures. A wall formwork is typically used for producing formworks for walls, columns, foundations, shafts or the like. A wall formwork comprises a formwork facing on the front facing towards the concrete and elements supporting the formwork facing on the back, such as frames, longitudinal beams and crossbars. The two sides of a wall to be concreted are delimited by wall formworks. The outer face of each wall formwork configured as a formwork facing in that case adjoins the concrete. Wall formworks facing each other are, as a matter of principle, retained by a plurality of anchor rods. The anchor rods are in this case pushed through openings - so-called anchor holes - in the wall formworks, and attached at their ends to the elements supporting the respective formwork facing in such a way that at least the tensile force acting upon the anchor rods during concreting is absorbed, but preferably also a compressive force.

Wall formworks are exposed to loads due to the concrete pressure, which rises together with the height of a wall to be concreted. Wall formworks, anchor systems and the number of anchor systems used must be designed accordingly.

As a matter of principle, the preparation of a wall formwork entails the problem that reliable anchoring is to be made possible by a corresponding arrangement of the anchor points in the wall formwork. At the same time, it is necessary to be able to reliably absorb the concrete pressures occurring in a wall formwork in each case. The arrangement of the anchor points in conventional wall formworks is optimized, in particular, for a given maximum
load, so that flexible forming is not possible, and the resulting expenditure for a rational assembly or dismantling of the wall formworks is unsatisfactory.

Furthermore, it is not readily possible, as a rule, to combine wall formworks with different dimensions and formats with each other. As a rule, the compatibility of wall formworks is limited by individual dimensions and different arrangements of anchor points, so that a multitude of wall formworks has to be stored in order to prepare, in particular, large-surface wall formworks.

Unless otherwise stated below, the above-mentioned features can be combined in any manner, individually or in any combination, with the subject matter of the invention described below.

A concrete form system is known from US 8,011,637.

Document "Firmenschrift der Peri GmbH, Trio Housing, D89264 WeiBenhorn, 09/2009" discloses a wall formwork comprising only one anchor hole. Further, the document discloses a wall formwork for concrete structures, comprising more than anchor points in one half but no anchor points in the other half.

FR 1 011 770 A discloses a formwork comprising a distribution of anchor holes which allow flexible corner connections.

DE 195 07 384 A1 discloses a formwork comprising crossbars which are attached to longitudinal beams in a flexible manner.

It is the object of the invention to further develop a wall formwork for concrete structures which allows a flexible anchoring of the anchor points depending on the arising concrete pressure.
The object of the invention is achieved by a wall formwork having the features of one of the independent claims. Advantageous embodiments are apparent from the dependent claims.

First of all, a wall formwork is proposed in which more anchor points are disposed in one half of the wall formwork than in the other half. Such a wall formwork is intended and suitable for erecting it in such a way that, in relation to the horizontal central axis, there are more anchor points in the upper portion of the wall formwork than in the lower portion.

The essential thing is the idea of making possible an anchoring of the wall formwork suited to the requirements. To this end, the anchor points are provided in an asymmetrical manner in the upper and lower portions of the wall formwork, in such a way that, in the mounted state, more anchor points are provided in the upper portion than in the lower portion. Depending on the arising concrete pressure in the wall formwork, a specific anchoring can then take place. This makes a flexible anchoring of the anchor points as required possible, depending on the arising concrete pressure in the wall formwork. In principle, the concrete pressure varies in the process depending on the concreting height of a wall formwork. Accordingly, the anchor points - in the form of anchor holes - are chosen depending on the concreting height, particularly in such a way that the vertical spacing of the anchor points used, and preferably the number of anchor points used and disposed vertically spaced, varies, depending on the load-related situation. The number of anchor rods to be inserted, and thus the assembly expenditure and dismantling expenditure can thus be advantageously minimized. The number of different wall formworks can also be minimized in this manner.

Anchor holes that are not required are closed with a cap, preferably by positive fit. For closure, the cap is connected with the anchor hole for instance by screwing or by latching.
If a low concreting height is required, the use of a reduced number of vertically spaced anchor points suffices for reliably anchoring a wall formwork. In particular, the anchor points in the form of anchor holes are chosen in such a way that at least one anchor point from the lower portion and at least one anchor point from the upper portion are used for anchoring. Therefore, an anchor point above the horizontal central axis is used as an anchor point from the upper portion. Typically, it is sufficient if, seen in the vertical direction, only two of, as a rule, four anchor points provided in the vertical direction are used for anchoring if the concrete pressure is relatively low.

If a high concreting height is required and if therefore an increased concrete pressure is produced in the wall formwork, then preferably more than two vertically spaced anchor points are used for anchoring, i.e. typically three anchor points. In that case, the wall formwork typically has four anchor holes along the height direction, i.e. in the vertical direction. In that case, this wall formwork is anchored in such a way that it is capable of withstanding the increased loads over the entire height of the wall formwork.

In the case of more than two anchors inserted along the height, the anchor points used are, in particular, disposed in such a way that they are uniformly distributed over the height of the wall formwork in order to enable a particularly load-adapted construction of the wall formwork. Among one another, they then have identical spacings.

The structure according to the invention of the wall formwork therefore enables flexible anchoring, which can be individually and specifically adapted to the loads and at the same time permits a rational assembly of the wall formwork. Also, wall formworks can optionally be used for the fabrication of walls with a low height and with a height that, in comparison, is great, without always having to use all the anchor holes for anchoring, i.e. fitting them with anchors. Therefore, it is unnecessary to have different wall formworks in store for this purpose. The number of parts to keep in store can thus be advantageously minimized.
Furthermore, a wall formwork with such an arrangement of anchor points can be combined in an improved manner with other, differently designed wall formworks. The additionally provided anchor point in the upper portion of the wall formwork contributes to an improved capability of the wall formwork according to the proposal of being combined with differently dimensioned wall formworks. In particular, the arrangement of the additional anchor point in the upper portion is designed in such a way that, through it, the wall formwork can be connected to a differently dimensioned wall formwork. This increases the compatibility of the wall formwork, so that the wall formwork can be combined with other wall formworks in a variety of ways.

The anchor points, which are not provided symmetrically, are preferably disposed asymmetrically distributed over the height of the wall formwork, i.e., in particular, on at least three vertically spaced levels of the wall formwork. Height means the length of a wall formwork or formwork facing. The width of the formwork facing is in that case smaller than the height. In principle, a vertically spaced anchor point can comprise one or more anchor holes at the same level, i.e. height, of the wall formwork. Advantageously, there are four anchor holes, respectively, along the height, and two anchor holes, respectively, along the width.

In one embodiment of the invention, one or more anchor holes are located on the center line that separates the upper half of the wall formwork from the lower. This embodiment permits an optimized usage of the entire height of the wall formwork.

In one embodiment of the invention, an anchor point is disposed between the central anchor point and the upper anchor point, preferably in such a way that the anchor point is provided centrally or substantially centrally between the central and the uppermost anchor points.
It is provided in one embodiment that the vertically spaced anchor points comprise several anchor holes at the same level of the wall formwork, i.e. two or three, as a rule. At the lowermost anchor point, for example, two horizontally spaced anchor holes can thus be provided at the same level of the wall formwork. Equally, the central anchor point, the uppermost anchor point as well as the interposed additional anchor point can each comprise two anchor holes at the same level of the wall formwork, which in the erected state are horizontally spaced apart. This arrangement of the anchor points with anchor holes distributed across the width of the anchor holes ensures a particularly reliable anchoring of large-surface wall formworks. Depending on the required concreting height and thus depending on the loads, a flexible anchoring of the wall formwork can be carried out at the same time by specific selection of the vertically spaced anchor points, in order to make possible an efficient and reliable anchoring.

The additional anchor point in the upper portion of the wall formwork disposed between the central and uppermost anchor points is used particularly in combination with the lowermost anchor points at relatively low concrete pressures, i.e. primarily at concrete pressures that are reduced with respect to the height of the wall formwork. In that case, the arrangement of the corresponding anchor points is designed, in particular, in such a way that the loads arising can be securely absorbed by means of two vertically spaced anchor points, particularly by means of the lowermost anchor point and the additional anchor point in the upper portion of the wall formwork. Due to the number of anchor points used, which in comparison with a conventional anchoring is reduced, the assembly-related expenditure can be reduced, so that an efficient assembly or dismantling of a wall formwork is made possible.

In another embodiment, the lowermost anchor point, the central anchor point and the uppermost anchor point are disposed with substantially a uniform grid spacing. Furthermore, the wall formwork is preferably dimensioned in such a way that the spacing of the anchor holes at the edge to the outer horizontal and/or vertical boundary of the wall formwork
substantially corresponds to half of the grid spacing. In that case, the additional anchor point in the upper portion of the wall formwork is preferably disposed in such a way that the vertical spacing to the vertically adjacent anchor points largely corresponds to half of the grid spacing. In that case, the anchor points in the lower portion have a vertical spacing corresponding to the grid spacing, whereas the anchor points in the upper portion of the wall formwork have a vertical spacing corresponding to half of the grid spacing. This arrangement of the anchor points improves the load-adapted structure of the wall formwork. This is particularly advantageous in the case of increase loads on the wall formwork, for example due to relatively high concreting heights, such as, for example, concreting heights that approximately or largely correspond to the height of the wall formwork. Such an arrangement of the anchor points contributes to the capability of the wall formwork of being exposed to loads substantially uniformly over the height in this way.

In a preferred embodiment, the anchor points are disposed in the form of anchoring holes on at least one vertically extending axis. Preferably, at least three anchor holes are provided on a vertically extending axis. It is particularly advantageous to provide anchor holes on two vertically extending axes. In that case, two horizontally spaced anchor holes on a common level, i.e. height, of the wall formwork can be associated with a vertically spaced anchor point. Providing horizontally spaced axes with anchor holes enables a correspondingly large-surface and rugged configuration of wall formwork.

In one embodiment, the lowermost anchor point and the uppermost anchor point are equally spaced in relation to the horizontal central axis and disposed preferably axisymmetrically. It is particularly advantageous to provide a central anchor point on the horizontal central axis. The symmetrical arrangement of the lowermost and uppermost anchor points in relation to the horizontal central axis contributes to the capability of the wall formwork of uniformly absorbing the loads.
It is particularly advantageous to configure the anchor points of the wall formwork, particularly all anchor points disposed above and on the horizontal central axis, so that they can be closed. The anchor points are capable of accommodating a closure means in a sealing manner in order to prevent concrete from leaking from the wall formwork. Further sealing means can be provided in the anchor hole and/or on the closure means for an improved sealing of the anchor points. Anchor points that are not required for anchoring can in that case be securely closed as required. In particular, the anchor holes are configured in such a way that the closure means is accommodated so as to end flush with the formwork facing and that thus, there is no projecting portion of the closure means in the formwork facing. Consequently, the solidified concrete has a largely smooth surface. In this way, visible impressions of closed anchor points are avoided so that the wall formwork can be used in an advantageous manner, from a production standpoint, for preparing visually attractive exposed concrete.

In another embodiment, the anchor holes at the edge have a spacing of at least 20 cm, more preferably at least 40 cm, to the horizontal and/or vertical boundary of the wall formwork. What is meant by anchor holes at the edge are those anchor holes that adjoin the outer horizontal and/or vertical boundary of the wall formwork in at least one direction. This ensures that sufficient space is available at the anchor holes at the edge to provide a secure anchoring by means of anchor rods.

Particularly preferred dimensions of the wall formwork according to the proposal are formats having a width of 200 cm to 280 cm, more preferably 220 cm to 260 cm, and/or a height of 320 cm to 400 cm, more preferably 340 cm to 380 cm.

According to another aspect of the invention, a wall formwork system comprising a plurality of wall formworks is proposed, wherein at least two wall formworks have different dimensions, in particular height and/or width. At least one wall formwork corresponds to the wall formwork according to...
the proposal explained above, so that in this regard, reference may be made to the statements above in their entirety.

The formwork system makes it possible to combine the wall formworks in a flexible manner. In particular, the configuration of the wall formworks and the dimensioning of the dimensions is designed in such a way that differently dimensioned wall formworks can also be disposed in a standing, lying, vertically and/or laterally offset manner relative to one another, in order to enable, in a variety of ways, the stacking of a wall formwork for preparing a large-surface formwork.

It is particularly advantageous to configure the dimensions or the format of at least one further wall formwork with a width of 200 cm to 280 cm, more preferably 220 cm to 260 cm, and/or with a height of 280 cm to 320 cm, more preferably 300 cm. In particular, the arrangement of the anchor points is in that case designed in such a way that at least two vertically spaced anchor points in the respective wall formworks can be connected to each other. In that case, the connectable anchor points in the respective wall formworks are disposed so as to be aligned with each other. This ensures the compatibility between wall formworks with different heights, so that a variety of combinations of different formats of wall formworks is made possible.

The invention moreover relates to a system of wall formworks, comprising a wall formwork according to the claim, as well as a wall formwork with a smaller length or height with symmetrically distributed anchor holes, which are disposed along its length in the same way as anchor holes of the wall formwork according to the claim.

If the anchor holes are symmetrically distributed, they have a uniform or at least substantially uniform grid spacing relative to each other, the wall formwork advantageously being dimensioned in such a way that the spacing of the anchor holes to the outer boundary of the wall formwork, which in the erected state extends vertically and/or horizontally, corresponds to half of the grid spacing or at least substantially half of the grid spacing.
The anchor holes are disposed in a uniform, i.e. substantially equally spaced-apart grid spacing relative to each other in order to optimize the wall formwork with regard to the arising concrete pressure. In the process, the spacing of the anchor holes to the outer boundary of the wall formwork is also set in a specific manner. If a wall formwork is prepared with wall formworks of this type and filled with concrete, it is thus ensured that the wall formwork is exposed to the load particularly uniformly, in such a way that the loads are substantially evenly distributed across the arrangement of the anchor holes. The arrangement, which is, in particular, symmetrical, contributes to the concrete forces arising being absorbed in a uniformly distributed manner across the anchor holes. Excessive loads, and thus the danger of damage to the wall formwork, particularly in the region of the anchor holes and the anchor points, are thus avoided in an improved manner, so that an overall improved durability of the wall formwork is achieved. The arrangement of the anchor holes moreover contributes to preparing a rugged formwork in a manner that is advantageous as regards the assembly with few anchor holes, and thus, also few anchor points. The fewer anchor rods have to be used, the smaller the expenditure for assembly and dismantling.

The invention is explained in more detail below with reference to exemplary embodiments. In the Figures:

Fig. 1 shows a schematic representation of a wall formwork according to the proposal,
Fig. 2: shows lateral views of a wall formwork with a comparison of the courses of the concrete pressures given different anchorings,
Fig. 3: shows a wall formwork system.

The wall formwork 1 according to the proposal, which is depicted in the drawing, comprises an outer face configured as a formwork facing 6 as well
as a basic body. In particular, the basic body comprises a profile-shaped frame structure 18, which further preferably consists of longitudinal beams and crossbars for improved stiffening. The basic body is preferably made from metal, in particular light metal. Particularly advantageously, the basic body can be made from hot-dipped galvanized steel or extruded light metal.

It is apparent from the illustration in Fig. 1 that the anchor points in the form of anchor holes 2, 3, 4, 5 are disposed distributed over the height 10 of the wall formwork, i.e. at different levels, i.e. heights of the wall formwork 1, with the upper portion 8, i.e. the one half, of the wall formwork having more anchor holes than the lower portion 9, i.e. the other half. In particular, the arrangement of the anchor points is designed in such a way that, depending on the arising loads in a wall formwork, anchor points can be specifically used in order to obtain a reliable anchoring even under difficult boundary conditions such as high concrete pressures. Preferably, the anchor points are disposed in the form of anchor holes along two vertically extending axes. An anchor point at a certain level, i.e. height, of the wall formwork 1 comprises - as is apparent from Fig. 1 - two horizontally spaced anchor holes at the same height of the wall formwork. Thus, the vertically spaced anchor points in the form of anchor holes also extend across the width 11 of the wall formwork. In principle, it is also possible to allocate only one anchor hole to a vertically spaced anchor point and to dimension the wall formwork 1 as a whole accordingly. In such a case, the anchor holes are then provided, in particular, along a vertically extending axis.

Preferably, an anchor point is provided on the horizontal central axis 7. In the case of Fig. 1, two horizontally spaced anchor holes are associated with the central anchor point 3. Furthermore, the wall formwork 1 comprises an uppermost anchor point 5 in the upper portion 8 and a lowermost anchor point 2 in the lower portion 9 of the wall formwork 1, with the uppermost anchor point 5 and the lowermost anchor point 2 being disposed substantially equally spaced, i.e., in particular, axisymmetrically, in relation to the horizontal central axis 7. Another anchor point 4 is provided between
the uppermost anchor point 5 and the central anchor point 3 as an additional anchor point in the upper portion 8 of the wall formwork. In the present case, the additional anchor point 4 with two horizontally spaced anchor holes 4 is disposed centrally between the uppermost anchor point 5 and the central anchor point 3. The vertical spacing of the additional anchor point 4 to the vertically adjacent anchor points is in that case largely identical. In that case, the additional anchor point 4 in the upper portion 8 of the wall formwork can expediently be used as an optional anchor point of a wall formwork. This makes it possible to adapt the anchoring of the wall formwork 1 specifically to the arising loads and to thus keep the overall assembly-related expenditure small.

In the case of conventional wall formworks, for example with a height of about 360 cm, the concreting height in the majority of applications, for example in about 70% of cases of application, regularly corresponds to no more than 3/4 of the height 10 of the wall formwork, or no more than 240 cm. Due to the reduced loads, it is advantageous in this case to reduce the number of anchor points used that are disposed distributed over the height 10 of the wall formwork. In that case, an anchor point from the lower portion 9, i.e. the anchor point 2, and an anchor point from the upper portion 8, are used, with the additional anchor point 4 between the uppermost anchor point 5 and the central anchor point 3, in particular, being used as the anchor point from the upper portion. This ensures - in manner yet to be explained - a favorable concrete pressure course in a wall formwork.

In a minority of applications, for example in about 30% of cases of application, the concreting height corresponds to more than 3/4 of the height 10 of the wall formwork, or more than 240 cm. Due to the increased loads, it is in this case advantageous to use a greater number of vertically spaced anchor points for anchoring. Preferably, the anchor points are chosen in such a way that they are substantially uniformly spaced over the height 10 of the wall formwork. In the case of Fig. 1, the anchor points that can be used for this purpose are disposed in the form of anchor holes with a uniform grid spacing 16 relative to one another, with the spacing 12 of the
anchor holes at the edge to the outer horizontal and/or vertical boundary of the wall formwork substantially corresponding to half of the grid spacing. Thus, in the case of high loads, the anchor points 2, 3 and 5 are used for anchoring, and the anchor point 4 or the two anchor holes 4 are closed with a plug. Thus, a particularly well load-adapted configuration of the wall formwork is made possible that withstands the increased loads in particular due to high concreting heights. This particularly applies to concreting heights of more than 3.60 m. In that case, wall formworks are also disposed one on top of the other in order to reach the desired heights above 3.60 m. Anchor holes that are not used are closed with a removable plug.

Fig. 2 shows lateral views of wall formworks that schematically illustrate the concrete pressure courses given different anchorings. In Fig. 2a), the wall formwork is anchored at three vertically spaced anchor points. This arrangement of the anchor points is used particularly when the concreting height is more than 3/4 of the height 10 of the wall formwork or more than 240 cm. In principle, this arrangement can also be used in cases in which the loads exceed a certain admissible threshold value for the concrete pressure in a wall formwork due to other boundary conditions. Anchoring is effected by means of anchor rods that are passed through anchor holes of the anchor points. In the case of Fig. 2a), the lowermost anchor point 2, the central anchor point 3 and the uppermost anchor point 5 are being used, with the anchor points being disposed, in particular, uniformly distributed over the height 10 of the wall formwork. This anchoring then results - as is apparent from Fig. 2a) - in a substantially constant concrete pressure course 18 over the height of the wall formwork. This ensures that the increased loads in the wall formwork, particularly due to high concreting heights, can be reliably absorbed by the anchoring and that thus, an admissible concrete pressure in a wall formwork is not exceeded.

Fig. 2b) depicts an anchoring in the case of a reduced load on the wall formwork 1. In the present case, two anchor points distributed over the height 10 of the wall formwork are used for anchoring. This arrangement is
used particularly when the concreting height is no more than 3/4 of the height 10 of the wall formwork or no more than 240 cm. In principle, it is also possible that the loads drop below a certain threshold value for the concrete pressure in a wall formwork due to other boundary conditions. In the case of Fig. 2b), an anchor point from the lower portion 9 and an anchor point from the upper portion 8 are chosen, with the additional anchor point 4 between the uppermost anchor point 5 and the central anchor point 3, in particular, being used as the anchor point from the upper portion. This anchoring then results - as is apparent from Fig. 2b) - in a concrete pressure course 17 that increases towards the lower end of the wall formwork 1. The arrangement of the anchor points is preferably designed in such a way that a maximum concrete pressure of 100 kN/m² in the wall formwork 1 is not exceeded. In this way, the loads in the case of a reduced concreting height of a wall formwork can be reliably absorbed by a smaller number of vertically spaced anchor points, so that, in this respect, the assembly-related expenditure is reduced. This contributes to an efficient assembly or dismantling of the wall formwork.

Particularly preferably, at least two vertically spaced anchor points of a wall formwork 1 according to the proposal are disposed in such a way that they can be connected to a differently dimensioned wall formwork, in particular with a different height and/or width. In that case, at least two vertically spaced anchor points in the respective wall formworks are, in particular, disposed so as to be aligned with each other in order to thus enable a joint anchoring. Particularly preferable is the connectable arrangement of a wall formwork according to the proposal with a height of 360 cm with another wall formwork that has a height of 300 cm. This makes it possible to combine wall formworks 1 according to the proposal in a variety of ways with wall formworks of different dimensions.

Figure 3 illustrates that the wall formwork shown in Figure 1 can be combined with a wall formwork 19, which can only use symmetrically distributed anchor holes and which has a smaller height or length, without changing the anchor hole pattern. Thus, the wall formwork according to the
invention can advantageously be used in the same manner as the wall formwork 19 and combined therewith. Figure 3 therefore shows an example for a system of wall formworks, comprising a wall formwork 1 according to the claim as well as a wall formwork 19 with a smaller length or height with symmetrically distributed anchor holes 20, which are disposed along its length in the same way as anchor holes of the wall formwork according to the claim.

The drawings show that both halves of a formwork comprises one or more anchor holes. Otherwise, a flexible anchoring of the anchor points depending on the arising concrete pressure is as a rule not possible.
Reference numerals

1  Wall formwork
2  Lowermost anchor point
3  Central anchor point
4  Additional anchor point
5  Uppermost anchor point
6  Formwork facing
7  Horizontal central axis
8  Upper portion of 1
9  Lower portion of 1
10 Height of 1
11 Width of 1
12 Spacing from edge
13 Edge boundary (horizontal)
14 Edge boundary (vertical)
15 Anchor rod
16 Grid spacing
17 Course of concrete pressure
18 Frame structure
19 Wall formwork
20 Anchor hole
Claims

1. A wall formwork (1) for concrete structures, comprising a basic body (18), an outer face configured as a formwork facing (6), anchor holes (2, 3, 4, 5) for the detachable connection to other wall formworks, characterized in that the wall formwork comprises more anchor holes (2, 3, 4, 5) in one half (8) than in the other half (9), both halves comprises at least one anchor hole, one or more anchor holes are located on the center line that separates the upper half of the wall formwork from the lower, an additional anchor holes (4) are disposed between the central anchor hole respectively holes (3) and an hole repsectively holes (5), which, viewed along the length, is at the edge, in such a way that the additional anchor hole or holes (4) are provided centrally between the central and the uppermost anchor holes.

2. The wall formwork according to the preceding claim, wherein viewed along the length, or in the erected state, along the height, the lowermost anchor hole or holes (2), the central anchor hole or holes (3) and the uppermost anchor hole or holes (5) are disposed with a uniform grid spacing (16) relative to one another, and the wall formwork (1) is dimensioned in such a way that the spacing (12) of the anchor holes at the edge to the outer horizontal (13) and/or vertical (14) boundary of the wall formwork corresponds to half of the grid spacing (16).

3. A wall formwork (1) for concrete structures, comprising a basic body (18), an outer face configured as a formwork facing (6), and anchor points in the form of anchor holes (2, 3, 4, 5) for the detachable connection to other wall formworks, characterized in that the wall formwork comprises more anchor points in one half (8) than in the other half (9).

4. The wall formwork according to the preceding claim, wherein the anchor points (2, 3, 4, 5) are disposed distributed over the length (10) of the wall formwork, in particular on at least three different levels of
the wall formwork (1), and/or wherein one or more anchor holes on the same length of the wall formwork (1) are associated with a longitudinally spaced anchor point (2, 3, 4, 5).

5. The wall formwork according to the preceding claim, wherein an additional anchor point (4) is disposed between a central anchor point (3) and an anchor point (5), which, viewed along the length, is at the edge, preferably in such a way that the additional anchor point (4) is provided substantially centrally between the central and the uppermost anchor points.

6. The wall formwork according to any one of the preceding claims, wherein, viewed along the length, or in the erected state, along the height, the lowermost anchor point (2), the central anchor point (3) and the uppermost anchor point (5) are disposed substantially with a uniform grid spacing (16) relative to one another, and preferably, the wall formwork (1) is dimensioned in such a way that the spacing (12) of the anchor holes at the edge to the outer horizontal (13) and/or vertical (14) boundary of the wall formwork corresponds to half or substantially half of the grid spacing (16).

7. The wall formwork according to any one of the preceding claims, wherein the anchor points (2, 3, 4, 5) are disposed on at least one axis in the wall formwork (1) that extends along the width or, in the erected state, vertically, and preferably at least three anchor holes are disposed along an axis that extends along the width or vertically.

8. The wall formwork according to any one of the preceding claims, wherein, viewed along the length, the lowermost anchor point (2) and the uppermost anchor point (5) are equally spaced or at least substantially equally spaced in relation to the central axis (7) and are preferably disposed axisymmetrically.
9. The wall formwork according to any one of the preceding claims, wherein the anchor points, particularly all anchor points disposed above and on a central axis (7), are configured so that they can be closed, particularly by positive fit with a cap.

10. The wall formwork according to any one of the preceding claims, wherein the length or height (10) of the wall formwork is 320 cm to 400 cm, particularly preferably 340 cm to 380 cm, and/or the width (11) of the wall formwork is 200 cm to 280 cm, more preferably 220 cm to 260 cm.

11. The wall formwork according to any one of the preceding claims, wherein the grid spacing (12) of the anchor points (2, 3) in the lower portion (9) of the wall formwork is between 100 cm and 140 cm, more preferably 120 cm, and/or in which the vertical spacing of vertically adjacent anchor points (3, 4, 5) in the upper portion (8) of the wall formwork (1) is between 40 cm and 80 cm, more preferably 60 cm.

12. A wall formwork system comprising a plurality of wall formworks, wherein at least one wall formwork (1) is configured according to any one of the preceding claims, characterized in that the at least two wall formworks have different dimensions, in particular height (10) and/or width (11).

13. The wall formwork system according to the preceding claim, wherein at least one wall formwork has a height of 340 cm to 380 cm, preferably 360 cm, and at least one further wall formwork has a height of 280 cm to 320 cm, preferably 300 cm, and preferably at least two vertically spaced anchor points in the differently dimensioned wall formworks are disposed so as to be connectable for anchoring, in particular aligned with each other.

14. Method for anchoring a wall formwork according to any one of the preceding claims, wherein the vertically spaced anchor points (2, 3, 4, 5) for anchoring are chosen depending on the concreting height, in such a way that the vertical spacing of the anchor points used and, optionally, the number of anchor points used, vary.
15. The method according to the preceding claim, wherein, given a concreting height of more than 3/4 of the height (10) of the wall formwork or of more than 240 cm, the vertically spaced anchor points (2, 3, 5) are chosen in such a way that they are substantially uniformly spaced relative to each other and are preferably axisymmetrically disposed in relation to the horizontal central axis (7).

16. The method according to any one of the preceding claims, wherein, given a concreting height of no more than 3/4 of the height (10) of the wall formwork or of no more than 240 cm, the vertically spaced anchor points are chosen in such a way that at least one anchor point (2) from the lower portion (9) and at least one anchor point (4) from the upper portion (8) is used, preferably in such a way that a lowermost anchor point and an additional anchor point (4) provided between the uppermost and the central anchor point are used.

17. The method according to any one of the preceding claims, wherein anchor holes that are not used for anchoring are provided with a closure means, preferably in such a way that the closure means ends flush with the formwork facing (6).
FIG. 1
INTERNATIONAL SEARCH REPORT

PCT/EP2013/069827

A. CLASSIFICATION OF SUBJECT MATTER
INV. E04G9/00 E04G11/00 E04G13/02 E04G17/06
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database consulted during the international search (name of data base and, where practicable, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>X</td>
<td>FR 1 011 770 A (CORON LOUIS) 26 June 1952 (1952-06-26) figure 2</td>
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<td>A</td>
<td>WO 2011/070530 A1 (ROJAS PIMIENTO EFRAIN [CO]) 16 June 2011 (2011-06-16) figures 1-3</td>
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<td>ES 2 113 770 A1 (ESPINA DIAZ AGUSTIN [ES]) 1 May 1998 (1998-05-01) figure 1</td>
<td>3, 4, 7, 10, 12-17</td>
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<td>A</td>
<td>JP 410 025 890 A (KUCHIKU KOGYO KK) 27 January 1998 (1998-01-27) figures 4, 5</td>
<td>1, 4, 7-9, 14-17</td>
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[X] Further documents are listed in the continuation of Box C.  [X] See patent family annex.

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Date of the actual completion of the international search
19 November 2013

Date of mailing of the international search report
26/11/2013

Name and mailing address of the ISA/
European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040
Fax: (+31-70) 340-3016

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<td>EP 1 347 121 A2 (IZQUIERDO LUIS W [CL]) 24 September 2003 (2003-09-24) figure 4</td>
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<td>JP H07 247676 A (KOMATSU MFG CO LTD) 26 September 1995 (1995-09-26) figure 2</td>
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