

SELF-CLIMBING FORMWORK AND/OR SELF-CLIMBING SCAFFOLD UNIT
WITH A CLIMBING CYLINDER

The invention relates to a self-climbing formwork and/or a self-climbing scaffold unit with a climbing cylinder which is provided for raising or lowering a formwork and/or a scaffold unit along a wall of a building.

Self-climbing formworks are known wherein the lift cylinders are affixed to climbing rails which run along a wall during a climbing process.

DE 21 54 188 A1 discloses and describes a device for concreting pillars. A pillar is concreted in a formwork which is surrounded by scaffolding. The formwork is moved along the individual pillar sections by means of a climbing cylinder. At its lower end the climbing cylinder is fixed by means of a pressure plate on a pillar section which has already hardened. At its upper end the climbing cylinder is provided with two opposed pressure ribs which are pivotally mounted and in this way can be moved past cross members of the scaffolding. During a lifting movement of the climbing cylinder, the pivoted-out pressure ribs engage in recesses on the scaffolding and abut against the cross members of the scaffolding.

It is the object of the invention to construct a climbing cylinder on a self-climbing formwork or on a self-climbing scaffold unit in such a manner that it can be used and also shifted more easily.

The object is achieved according to the invention by the features of claim 1.

Commercially available lift cylinders which operate and are embodied for example as hydraulically operating lift cylinders can be used as climbing cylinders. The lift cylinders only need to be adapted to the invention at their respective free ends whereby at one end, a fixing connection is provided at one fixed anchor point of the wall and at the other end, a movable support is provided at the free end of the piston of the lift cylinder, which can engage in bearing bolts of the climbing rails at any points of the climbing rails. The climbing rails can carry formwork, platforms and any other bracing which can be raised or lowered with the climbing rails by means of the climbing cylinder or cylinders. The climbing rails can also be integrated in a frame unit which can receive and carry formwork in addition to other units. When a lowering or raising process has been completed by means of the climbing cylinder or cylinders, the climbing cylinder or cylinders can be shifted to other anchor points for a new movement process of the climbing rails.

The climbing cylinder or cylinders are placed at locating points formed on the climbing shoe or shoes. Consequently, always the same fastening points on the climbing shoe or shoes and the climbing cylinder or cylinders are used for holding the climbing cylinder or cylinders on the climbing shoe or shoes. The climbing system can thus have a simple structure and any scope for incorrect connection for a fixed mounting of the climbing cylinder is eliminated. When the climbing cylinders are placed on the climbing shoes, the climbing cylinder or cylinders are supported on the climbing shoe or shoes during a lifting process.

In a preferred embodiment of the invention, the climbing cylinder or cylinders are affixed to a climbing shoe or shoes which are attached to the wall in a fixed position. This has the advantage that the climbing cylinder or cylinders can always be attached at the same fixing points

of climbing shoes which are fixed to the wall at the anchor points provided. An anchor point thus bears the climbing shoe which guides the climbing rails along the wall at a defined distance and can at the same time hold the climbing rail permanently in one position. The climbing cylinder uses the climbing shoe as a fixed bearing and the climbing cylinder can raise or lower the climbing rail by means of a piston stroke.

In a further embodiment, the climbing cylinder or cylinders are pivotally hinged at the fixed fixing, namely the anchor point or the climbing shoe. This has the advantage that when the piston is withdrawn into the housing of the climbing cylinder, the climbing cylinder can be pivoted out of engagement with the bearing bolts of the climbing rail, whereby when the piston retracts into the housing of the climbing cylinder, a bearing bolt impinging upon the catch of the climbing cylinder pivots the climbing cylinder to such an extent that the piston can be retracted into the housing of the climbing cylinder without any interference.

If, in this connection, the climbing cylinder is fixed in a spring-mounted manner at the anchor point and/or the climbing shoe, it can automatically pivot back into its initial position as soon as the free end of the climbing cylinder is no longer in contact with a bearing bolt.

The pivotal support of the climbing cylinder at the free end is advantageously embodied as a catch, as already stated, which can be brought into engagement with a bearing bolt of the climbing rail in a particularly simple manner. It is likewise simple to release the bearing connection between the catch and the bearing bolt by retracting the piston into the housing of the climbing cylinder. The catch is pivotally hinged to the piston and at the same time, at the support, in this case the catch, a mounting plate is provided as a counterbearing for abutment against the

respective climbing rail. This has the advantage that no moments from the bearing load of the climbing rail are introduced into the piston rod when the climbing cylinder raises or lowers a climbing rail.

It is understood that the spacing of the bearing bolts at the climbing rail or rails is matched to the possible piston stroke of a climbing cylinder. The piston path of a climbing cylinder is always longer than the spacing of adjacent bearing bolts on a climbing rail. A climbing cylinder must always be able to retract its piston rod with the catch hinged thereon to such an extent that the catch can automatically pivot into a position in which the catch can reliably grasp below a bearing bolt of the climbing rail. When a climbing process has been completed, the climbing cylinder or cylinders are moved to adjacent anchor points or climbing shoes so that another climbing process can be carried out after another concreting section has been completed. The climbing cylinder can be moved together with hydraulic hoses connected to the climbing cylinders or the climbing cylinders are uncoupled from the hydraulic hoses by means of quick connectors for the process of shifting to other fixed mounting points. After the climbing cylinder has been replaced, the hydraulic connection between the climbing cylinder and a hydraulic unit is made again.

In one exemplary embodiment the following figures show a section of a wall on which a climbing cylinder is fixed which holds a rail to which various attachments can be fixed.

It is understood that the bearing bolts of the climbing rails can also be replaced by technically equivalent means. Thus, matched catches or supports of a sliding shoe can also engage in through openings on the climbing rails or projections can be constructed on the climbing rails which

can be gripped or grasped from below by corresponding supports of the sliding shoe.

In the figures:

Fig. 1 shows a climbing cylinder of a self-climbing formwork according to the invention in side view on a wall consisting of a first and a second concreting section;

Fig. 2 shows a further side view to Fig. 1 with the climbing cylinder according to the invention in the extended state; and

Fig. 3 shows a side view with a climbing cylinder according to the invention showing how this pivots on the fixed mounting when the piston retracts.

The figures in the drawings show the climbing cylinder according to the invention and the associated parts highly schematically so that the structure and the operating mode of the climbing cylinder can be clearly shown.

CLAIMS

1. Self-climbing formwork and/or self-climbing scaffold unit in the building area comprising a climbing cylinder (10), wherein a climbing rail or climbing rails (22) can be moved along a wall (12) of a building by means of a climbing cylinder (10), and at one end the climbing cylinder or cylinders (10) can be detachably affixed in a fixed position to an anchor point of the building and at the other end the climbing cylinder or cylinders (10) have a support (30) communicating with the climbing cylinder or cylinders (10), which, in the retracted state of the climbing cylinder (10) runs under a bearing bolt (24, 24', 24", 24'") of the climbing rail (22) or the climbing rails (22) which are held guided on the wall (12) by means of climbing shoes (18), and when the climbing cylinder or cylinders (10) move into the extended state, the climbing rail (22) or the climbing rails (22) move along the wall (12), wherein the climbing cylinder or cylinders (10) are disposed on the climbing shoe or shoes (18) and the climbing cylinder or cylinders (10) are pivotally hinged at the climbing shoes (18).
2. The self-climbing formwork and/or self-climbing scaffold unit according to claim 1, characterised in that the climbing cylinder or cylinders (10) are affixed to the climbing shoe or shoes (18) which are attached to the wall (12) in a fixed position.

3. The self-climbing formwork and/or self-climbing scaffold unit according to claim 2, characterised in that the climbing cylinder or cylinders (10) can be fixed in a spring-mounted manner at the anchor point and/or the climbing shoes (18).
4. The self-climbing formwork and/or self-climbing scaffold unit according to any one of claims 1 to 3, characterised in that the climbing cylinder or cylinders (10) have pivoting supports at their free end which are constructed as catches (30).
5. The self-climbing formwork and/or self-climbing scaffold unit according to any one of claims 1 to 4, characterised in that at the support or the catch (30) a mounting plate (32) is provided as a counterbearing for abutment against the climbing rail (22).