

PATENT SPECIFICATION

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(54) A SHEETING ARRANGEMENT FOR SHEETING OF A DITCH

(71) I, JOSEF KRINGS of Hans Bickler Str, 23, D5138 Heinsberg, Oberbruch, Germany; a German citizen, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an arrangement for the lining or shoring of ditches which includes vertical supports with a slotted, hollow box section and sheeting walls which are guidingly positioned in the supports.

In the lining or shoring of ditches in accordance with recently developed lining arrangements, the walls are of a prefabricated construction having flange-like guide elements which are guided in vertical supports, the vertical supports at the same time serving as connecting members for the walls and having connected thereto the usual spreaders or clamping bases. The supports in the walls can be forced into the soil independently of one another, or may be independently pulled out of the soil. It has been found that in many cases the frictional contact between the supports and the sheeting walls is relatively great, particularly when the cooperating parts are not finished to fit precisely and/or to be fitted into one another.

In view of the foregoing, this invention is directed to a sheeting arrangement which is so constructed wherein it avoids the foregoing short comings while at the same time having the required stability.

According to the invention, there is provided excavation walling apparatus comprising means for the shoring of ditches or other excavations, said means including vertical posts of a hollow slotted box-like cross-section, lining wall plates and guide heads carried by each of said wall plates in vertically spaced relation and guided in said posts, each post having at least one web

disposed normal to the plane of an adjacent one of said lining wall plates and inner and outer webs disposed parallel to the plane of adjacent ones of said wall plates, characterized in that said guide head has a plurality of rollers, at least some of said rollers being mounted on axes disposed normal to the plane of a respective lining wall plate for rotation in engagement with said one web and others of said rollers being mounted for rotation on axes extending within the plane of the respective lining wall plate between side surfaces thereof and perpendicular to an adjacent post, said other rollers being offset relative to the respective lining wall plate such that they run only on said inner web of the respective post which inner web will be adjacent to the centre of a ditch being shored.

In accordance with a further development of the invention, on the front side of the sheeting wall there have been mounted projecting rollers, at least certain of which are mounted for rotating about axles disposed generally perpendicular to the plane of the sheeting walls while other rollers rotate about axles which lie in the plane of the sheeting wall and extend perpendicular with respect to the associated support. In this embodiment of the invention, the sheeting wall, because of the lateral soil pressure exerted thereon in use, is supported by one leg of the support while the sheeting wall can support itself against longitudinal forces relative to the support by means of the other rolls.

A still further development of the invention provides for the mounting of the rolls which have the axles thereof lying in the plane of the sheeting wall and perpendicular to the support, as fitting against only one leg of the support.

Yet another feature of the invention is to resiliently mount the rolls.

In a still further embodiment of the invention, there is mounted on the front side

of the sheeting wall several bearings which are spaced from one another and in which pairs of rolls are mounted for rotation about an axle arranged perpendicular with respect to the plane of the sheeting wall. Advantageously, the rolls of the pair of rolls are at least part spherical rolls.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings:

Figure 1 is a horizontal sectional view through a support and a part of a shoring wall taken generally along the line I-I of Figure 3 with the shoring wall being shown in elevation for purposes of clarity.

Figure 2 is a horizontal sectional view similar to Figure 1, but taken along the line II-II of Figure 3.

Figure 3 is a vertical sectional view taken through the support generally in the plane of the sheeting wall with intermediate portions of both the support and sheeting wall being broken away.

Figure 4 is a horizontal sectional view similar to Figure 1, but taken along the line IV-IV of Figure 5 and shows the modified form of guidance.

Figure 5 is a fragmentary vertical sectional view taken along the line V-V of Figure 4 and shows more specifically the details of the mounting of the guidance structure of Figure 4.

Figure 6 is another horizontal sectional view similar to Figure 1 and shows still another embodiment of the guidance arrangement in accordance with this invention.

With reference to Figures 1-3, there is illustrated a first embodiment of a sheeting arrangement formed in accordance with this invention. The sheeting arrangement includes a support 1 and sheeting wall 2. The support 1 is essentially in the form of a I-sectioned beam which is provided at the ends of its legs or cross bars with terminal flange elements 3,4 which extend generally parallel to the stem or bridge 5 of the support 1. The flange elements 3 are in the form of strips whereas the flange elements 4 are in the form of angle members. The flange 3 cooperates with the flange 4 at each side of the support to define the generally U-shaped channel while the angle flanges 4 cooperate at one side of the support 1 to define a further generally U-shaped channel.

It is also to be noted that the stem or bridge 5 of the support is reinforced by two walls 6 which are parallel to the bridge 5 and are disposed on opposite sides thereof inwardly of the flanges 3,4. This reinforcement is effective to make the support 1 structurally rigid.

The sheeting wall 2 is provided with an edge wall or front wall 7 on which bearing type supports 8 are mounted in pairs. The bearing type supports 8 are disposed perpendicular to the wall 7 and have disposed therebetween a roller 9 which is mounted on an axle 10 carried by the bearing type supports 8. The axle 10 is disposed perpendicular to the plane of the sheeting wall 2 and generally perpendicular to the planes of the cross bars of the support 1. The roller 9 projects sufficiently from the sheeting wall 2 so as to extend within the confines of the support 1 and rollingly engage the adjacent reinforcing wall 6.

A further bearing type support 11 is attached to the sheeting wall 7 at a suitable distance above or below an associated roller 9. Each bearing type support 11 carries a disc-shaped roll 12 which is mounted on an axle 13 carried by the support 11 with the axle 13 being disposed transversely to the support 1 and generally within the plane of the sheeting wall 2. Each roller 12 is disposed perpendicular to the axis of its axle 13 and is arranged somewhat eccentrically within the associated space between the two legs of the support 1 so that it engages against the inner side of one leg of the support. As is shown in Figure 2, the roller 12 engages against the side or leg of the support 1 which is disposed away from the ditch which is being shored by the sheeting wall 2, the ditch not being shown. It is this leg of the support 1 which absorbs the greatest forces from the sheeting wall.

During the positioning or pulling of the sheeting walls 2, the rollers 9 and 12 provide for a relatively free guiding of the sheeting walls 2 within the supports 1 and thus greatly facilitate the positioning or pulling action. On the other hand, since sufficient free space will remain inside of the supports 1, any possible fouling of the rollers 9 and 12 is prevented and thus their functioning is assured. The rollers advantageously can be attached to the sheeting wall subsequent to the construction thereof.

In Figures 4 and 5 of the drawings, there is illustrated another embodiment of the invention. In accordance with this embodiment of the invention, the wall 7 of the sheeting wall is provided at vertically spaced intervals with bearing-type supports 14, each of which includes a tubular housing 15 in which an axle 16 is journaled. At the ends of each axle 16 there are mounted rollers which are disposed between the reinforcement wall 6 and the supporting flanges 3 and 4. The rollers are preferably at least part spherical so that when the sheeting wall 2 is being positioned or being pulled and the same shifts to an offset position with respect to the support 1, one of the rollers 17 will engage the corresponding leg of the support 130

1 and provide an anti-friction bearing so as to minimize the frictional contact between the sheeting wall 2 and the adjacent support 1.

5 It will be readily apparent that the embodiment of Figures 4 and 5 offer the same advantages as those of Figures 1-3. It is also to be understood that adjacent ones of the bearing-type supports 14 may be disposed eccentrically with respect to the general plane of the sheeting wall 2 so that they will combine to generally center the sheeting wall 2 with respect to the support 1, as is shown in Figure 4.

15 It is also to be understood that in the two embodiments of Figures 1 through 5 to make the bearing-type supports of a resilient construction would be advantageous. This would provide for the resilient mounting of the rollers 9, 12 and 17.

20 In Figure 6 there is illustrated still another embodiment of the invention. In lieu of the anti-friction type rollers of the embodiments of Figures 1 through 5, the front wall 7 of the sheeting wall 2 is provided with a guide strip 18 which is rigidly connected to the front wall 7. In Figure 6 the two legs of the support 1 are identified by the numerals 19 and 20 and the insides of these legs 19, 20, as well as the insides of the flanges 3, 4 which oppose the reinforcements walls 6 are coated with a material having a very low friction coefficient. For example, certain synthetic plastics materials will suffice. These coatings have been generally designated by the numeral 21. If desired, the guide strip 18 may also have a like coating 21' thereon in opposing relation to the reinforcement wall 6. Obviously, the coating 21' could be applied to the reinforcement wall 6 instead of on the guide strip 18.

40 It is also pointed out here that suitable coatings could advantageously be utilized in the embodiment of Figures 4 and 5 with these coatings being supplied to the same areas of the support 1 in those Figures.

45 Although only several preferred embodiments of the invention have been specifically illustrated and described herein, it is to be understood that minor variations may be

made in the sheeting arrangement without departing from the scope of the invention, as defined by the appended claims.

WHAT I CLAIM IS:—

1. Excavation walling apparatus comprising means for the shoring of ditches or other excavations, said means including vertical posts of a hollow slotted box-like cross-section, lining wall plates and guide heads carried by each of said wall plates in vertically spaced relation and guided in said posts, each post having at least one web disposed normal to the plane of an adjacent one of said lining wall plates and inner and outer webs disposed parallel to the plane of adjacent ones of said wall plates, characterized in that said guide head has a plurality of rollers, at least some of said rollers being mounted on axes disposed normal to the plane of a respective lining wall plate for rotation in engagement with said one web and others of said rollers being mounted for rotation on axes extending within the plane of the respective lining wall plate between side surfaces thereof and perpendicular to an adjacent post, said other rollers being offset relative to the respective lining wall plate such that they run only on said inner web of the respective post which inner web will be adjacent to the centre of a ditch being shored.

2. Apparatus according to Claim 1 wherein there are means resiliently mounting said rollers.

3. Apparatus according to Claim 2, 85 wherein those rollers which are mounted for rotation on axes disposed normal to the plane of the respective sheeting wall are mounted in pairs with the rollers of each pair being mounted for rotation about a single axis and said rollers are part spherical. 90

4. A sheeting arrangement substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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