

## A DRAINING DEVICE FOR WEAK GROUND

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to a draining device for weak ground, more particularly, to an improved draining device for weak ground wherein to drain weak ground by moistening the clamped paper injected into weak ground, thus to enable the stabilized lifting of the casing and to simplify the control method of the tension.

#### 2. Description of the Related Art

Conventionally, papers made out of fiber material that contain the heartwood of synthetic resins are generally used to drain the weak ground by means of clamping off said paper and moistening the water into said paper, and as mentioned above, the conventional draining device for weak ground is formed by coupling the casing of which is capable of operating the lifting with guide supporter that is connected and installed to the crane thereby, and it equips wire holder, for which is connects with the wire that couples with the driving mean to lift said casing, in the entire sides of the casing thereof, such that the wire operated the lifting of the casing, eccentric from the lifting center, and that resulted some troubles that the casing did not operate the lifting accurately in the vertical directions but inclined towards the front and rear, thereby the durability of device like casing was enormously declined.

Additionally, if there occurred some problem to control tension due to the expansion of said wire because of the long time usage, it was hard to find appropriate means to control the tension, so a lot of problems were generated such as too much working time was consumed to control the tension. Hereof, the present inventor made

an application and patented the device (Model No. 180865) relates to the draining device for weak ground to solve the problems described above, and hereinafter are some brief descriptions of the embodiment, attached herein, on the basis of the diagrams according to the present invention.

Fig. 1 is a front schematic view illustrating the embodiment of the conventional draining device for weak ground and fig. 3 is a sampling sectional view showing the construction of the clamp of which is formed in the lower part of the casing and fig. 4 is a sampling perspective view illustrating the driving mean in the purpose of operating the wire driving, whereby the casing 2 of which contains the connecting hole 11 of the paper 10, guide lifted by guide supporter 9, to camp off the paper 10 into weak ground in order to excrete the water and the draining device 1 that has the driving mean of lifting said casing 2 thereto;

Accordingly in the conventional device, the holder 3 is fixed on the casing 2 by equipping the connecting plate 2a , and was connected with one end of the wire 4 vertically at the point that is same with the central line P of the casing 2 according to said holder, in case of the other end of the wire 4, they are installed on the upper and lower parts of wire drum 16, 17 of which is equipped on the driving mean 6 that is installed on both sides of guide supporter 9 by passing through guide roller 21 of which is installed axially on upper and lower parts of guide supporter 9, thus on the same axis that of wire drum 16, 17 are installed axially, is installed the chain sprocket 18 axially, in each, and said drums 16, 17 and said chain sprocket is coupled with the chain 19, and on one sides of the upper and lower wire drums 16, 17 are installed a hydraulic motor 20 that could operate the static driving of which enables to move the holder vertically, according to guide supporter.

To solve the problem of controlling the tension in conventional,

the chain sprocket 18 is installed axially at the same point where wire drum 16, 17 are installed axially and connected with the wire drum through the chains, however, as the chains get damaged frequently, the device did not perform its function properly.

### **SUMMARY OF THE INVENTION**

Therefore, the object of the present invention is to provide the draining device for weak ground that could solve the problems thoroughly those of which were caused by using the conventional draining device, such that the wire drum is equipped on the device to lift the casing by drawing the wire reciprocally from the either side of the central part of the casing and fix one end of the wire on both sides of wire drum, the other end of the wire is fixed on the upper and lower parts of the holder of which is attached to the casing by passing through guide roller of which is established upper and lower parts of guide supporter, and by equipping the device to control the tension of the wire simply when the wire is expanded thereof, such that prevents the corruption of inclination of the casing towards the front and rear and simultaneously increases the durability of the device and moreover enables to control the tension of the wire simply.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a front schematic view illustrating the embodiment of the conventional draining device for weak ground;

Fig. 2 is a sampling perspective view illustrating the essential parts of the Fig.1;

Fig. 3 is a sampling sectional view showing the composition of the clamp of which is formed in the lower parts of the casing in the fig. 1;

Fig. 4 is a sampling perspective view illustrating the driving

device for operating the wire driving of fig. 1;

Fig. 5 is a front schematic view illustrating the preferred embodiment according to the present invention;

Fig. 6 is a sampling perspective view illustrating the essential parts of the device according to the present invention;

Fig. 7 is a sampling perspective view illustrating the driving device for wire driving according to the present invention;

Fig. 8 is a schematic view illustrating the wire drum according to the present invention.

#### DETAILED EMBODIMENT OF THE PRESENT INVENTION

Fig. 5 is a front schematic view illustrating the preferred embodiment according to the present invention, and fig. 6 is a sampling perspective view illustrating the essential parts of the device according to the present invention, and fig. 7 is a sampling perspective view illustrating the driving device for wire driving according to the present invention thereto, hereby the same components would be used to encourage the understanding of the part of the device that were same with the conventional ones.

As guide supporter 9, installed on one side of the crane 7 through the connecting rod 8 is formed as a rectangular frame in outline, and the casing 2, able to perform the lifting according to guide supporter 9, that is equipped inside guide supporter 9 looks like a lozenge-shaped in outline thereof, which the connecting hole 11 is established on said casing 2 vertically enough to penetrate and connect the paper 10, and the clamp 5 is formed on the lower part of the casing to do the clamping of the paper 10, i.e., said clamp 5 contains the pin 12 in order to set the pin 12 as a hanging device that would connect the paper 10 with the pin hanging hole 13 of which is established in the lower part of said casing.

In addition, holder 3 of which is coupled with the driving mean

6 designed to lift the casing 2 is formed on the both sides of the upper part in said casing 2, and wire clamp 15 is fixed on the upper and lower parts of the holder 3 in which is formed in integrative on the both sides of the casing 2, and such that the fixing location of said wire clamp 15 must conform to the central line P of the casing 2.

Meanwhile, guide supporter 9 is formed on either side of the driving mean of which is operating the lifting of said casing 2, and it forms the spiral concave hole 16a on the surface of wire drum 16 that plays the role of the driving source of the hydraulic motor 20, as shown in the fig 7,8, thus the end of the wire 4, installed on the upper wire clamp attached to the holder 3, is fixed in one side of the spiral concave hole 16a passing through guide roller 21 of which is formed in the upper and lower parts of guide supporter 9.

Furthermore, the end of the wire 4 fixed on the lower wire clamp 5 of the holder is fixed, passing through guide roller 24 of which is installed on the lower part of guide supporter 9 and also being lifted by the tension regulating mean 23 such as the cylinder, on the other side of spiral concave hole 16a.

Fig. 4a is a diagram of illustrating the clamped tool of which fixes the wire 4 on the wire drum 16 and 22 is a figure of the staple thereto.

As shown in the diagrams, draining device for weak ground 1 of preferred embodiment is to be used when draining the water for weak ground, thereby the detailed process of the embodiment according to the present invention is as follows;

In other words, as shown in fig. 1 of the preferred embodiment, in order to connect the paper 10 with draining device for weak ground 1, equipped on the crane 7, the paper 10 injects inside the upper parts of the casing 2 through the connecting hole 11 and then passes through the clamp 5 of which is formed in the lower

part of the casing 2 and then wind the paper 10 and hang on the pin 12 with the staple 22, next pull the paper 10 in both directions and the pin 12 of which connects the paper 10 would be hung by the pin hanging ball 13 of which is established on the clamp 5 of the lower part of the casing 2 thereof, and finally the setting up of the paper 10 is finished.

If the hydraulic motor 20 of the driving mean 6 of which is installed in both directions of guide supporter 9 under current condition, wire drum 16 spins and the wire 4 connected to the upper part of the holder 3 gets unwind from wire drum 16, on the contrary, the wire 4 connected with the lower part of the holder 3, gets wind to the wire drum 16 and, at the same time, the holder and the casing 2 connected to the holder 3 descend accordingly.

The paper 10 clamped to the casing 2 descends to weak ground and clamps off the moisture.

Subsequently, when the hydraulic motor 20 operates to the opposite directions, the holder 3 coupled with wire drum 16 through the wire 4 and the casing 2 clamped by the holder 3 ascends and the paper 10 moistens and drains off the water from weak ground, as it is clamped into weak ground, . And by this way, the water draining from weak ground is performed by clamping the number of papers 10 into weak ground.

At this moment, spiral concave hole 16a is formed on the surface of wire drum 16 thereof, such that the wire 4 gets wind or unwind according to the spiral concave hole 16a, and as the wire 4 never slips on wire drum 16 thereof, thereby the operation of the embodiment becomes stabilized.

In case of lifting the casing 2 by the reciprocal driving of the hydraulic motor 20 that constructs the driving mean 6, the holder 3 according to the preferred embodiment that is coupled with said casing 2 connects to the point of which is conformed to the central

line P of the casing 2 through the wire 4, thereby prevents the inclination towards the front and rear when lifting is operated beforehand.

Thus, the wire 4 usually gets expanded when it is used for long time, but when the expanded wire 4 descends the tension control mean 23 located on the lower part of guide supporter 9, the wire 4 of which passes through guide roller 24 that is lifted by the tension control mean 23 descends accordingly and that enables the controlling of the tension of the wire be very simple.

In short, when descending the casing 2 by operating the preferred embodiment, the winded wire 4 of which connects with the lower part of the holder 3 droops from wire drum 16 owing to the spinning of the driving mean 6, and at that time tension control mean 23 established on guide roller 24 operates to compensate the drooping phenomenon and the wire 4 never runs off and by above operational process, the device can be guaranteed for the safe operation.

As clearly described above, draining device for weak ground according to the present invention is a highly valuable device that would bring numerous of effects. Since it clamps the paper 10 to moisten and drain off into weak ground and then it clamps off the paper 10 into weak ground while the casing is lifted thereof, the device prevents the eccentric phenomenon, beforehand, by coupling said casing 2 between the upper part of the holder and the driving mean 6 through the wire 4 thereof, such that equipping said wire 4 at the point of which is the same location with the central line P of the casing 2.

As well the durability of such device according to the present invention would be epochally improved, the tension would be simply controlled by regulating the tension control mean 23 although the wire 4 is expanded due to the long time driving, thus lifting the

casing 2 would be stabilized because of the installment of wire drum 16, which is operating the driving of the casing 2, in both sides of guide supporter 9, moreover, since the spiral concave hole 16a is formed on the surface of wire drum 16, such that the slipping phenomenon of the wire 4 could be prevented.



What is claimed is :

1. Draining device for weak ground wherein has the casing (2) that contains the paper (10) connecting hole (11) of which is guide lifted by guide supporter (9) to enable the clamping of the paper (10) into weak ground, and draining device for weak ground (1) that has the driving mean of which operates the lifting of the casing (2), said method comprising the steps of:

(a) On either side of the upper part of said casing, the holder (3) is formed in integrative matching with the same point of the central line (P) of the casing (2) and connect the one end of the wire (4) vertically;

(b) The other end of the wire (4) coupled with the upper part of said holder (3) fix on one side of the end of wire drum (16), attached to the driving mean (6) of which is installed to guide supporter (9), by passing through guide roller (21) that is installed axially on upper and lower parts of guide supporter (9);

(c) The wire (4) connected to the lower part of said holder (3) is equipped on the lower part of guide supporter (9) and it passes through guide roller (24) of which is lifted by tension control mean (23) and then it fixes on the other end of wire drum (16) attached to the driving mean (6) of which is installed on each side of guide supporter (9);

(d) Spiral concave hole (16a) is formed on the surface of said wire drum (16), thereby it is capable to guide the wire (4) and the hydraulic motor (20), that could drive in regular and the opposite way, to drive wire drum (16).