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(54) Stopper for sealing a hollow post, method for incorporating such a hollow post into a fencing to be formed and a hollow post an open end of which is sealed with such a stopper.

(57) This invention relates to a stopper (1) for sealing an end of a hollow post, such as a fencing post, comprising a cover part (3) that can rest with a stop against the post end and a neck part (2) that can seal very tightly against the inside of the post, whereby the neck part (2) of the stopper (1) consists of two parts, the end part (4) with the smallest external dimension being provided with ribs (5) that extend longitudinally of the neck part (2) and the thickness of which increases in the direction of the cover part (3).

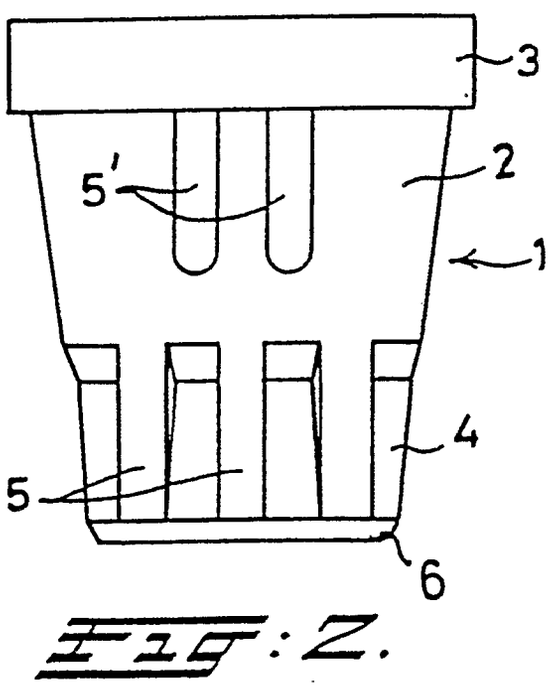

Fig: 2.

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STOPPER FOR SEALING A HOLLOW POST, METHOD FOR INCORPORATING SUCH A HOLLOW POST INTO A FENCING TO BE FORMED AND A HOLLOW POST AN OPEN END OF WHICH IS SEALED WITH SUCH A STOPPER

The present invention relates to a stopper for sealing an end of a hollow post, such as a fencing post, comprising a cover part that can rest with a stop against the post end and a neck part that can seal very tightly against the inside of the post.

Such a stopper is generally known. In the case of fencing posts, these posts are generally delivered to the customer with the stopper already in one end thereof. The stopper present in an end of the post seals so well against the inside of the post that it is only with great difficulty, and only by damaging the stopper, that this stopper can be removed from the post.

Such stoppers generally have the following drawback. If a said fencing post in which a stopper is already present is to be incorporated into a fencing to be formed, it may be necessary to hit the post into the ground with a hammer or the like, or to drive it into the ground in another way by applying a force to the end provided with a stopper. This and any other operation that may have to be carried out may seriously damage the stopper that is already present in the post end. The stopper is easily damaged by a hammer of the like as it is generally made of synthetic material or another somewhat deformable material. The result of damage to the stopper is that the latter no longer seals very tightly against the inside of the post, so that, during rain or humid weather for instance, water can penetrate into the post and corrode the inside of the post as the latter is generally made of metal.

It is the object of the present invention to provide a solution to the aforesaid drawback and it is to this end characterised in that the neck part of the stopper consists of at least two parts of different external dimension, the dimensions of the separate parts increasing viewed in the direction of the cover part.

The term "external dimension" used herein is to be understood as referring to the external diameter of the neck part of the stopper in the case of a stopper for sealing a round post, to the external rectangular dimensions of the neck part of the stopper in the case of a stopper for sealing a square or rectangular post, the external dimension of the neck part of the stopper corresponding to the internal shape of the post end in the case of the post having another shape. As the neck part of the stopper in accordance with the present invention consists of at least two parts of different external dimension, the stopper can be fixed in the post end in several steps. In the first instance, the stopper can be fixed in a clamped but detachable manner in the end of the post, after which the latter can be delivered to the user. If the user has to hit the post into the ground by means of a hammer or drive it into the ground in another way, he can remove the stopper from the post and drive the post without the stopper into the ground. Once the post stands sufficiently deep in the ground, the user can drive the stopper down to the stop of the cover part, after which an excellent sealing of the post end against moisture is ensured.

Advantageously, the neck part of the stopper consists of two parts, the end part with the smallest external dimension being provided with ribs that extend longitudinally of the neck part and the thickness of which increases in the direction of the cover part; in particular, the greatest thickness of the ribs equals the difference in dimension of the two neck parts.

This is a particularly advantageous embodiment because a so-called "two-step stopper" is obtained as a result, a certain degree of clamping of the stopper in the end of the hollow post being obtained through the presence of the ribs. However, this clamping is not such that the stopper can no longer be removed from the post. Due to the presence of the ribs, the clamping is such that the user can simply remove the stopper from the post. It will be clear that a great many forms and embodiments of ribs are possible. For instance, the part of smaller external dimension could be fitted with annular, radially projecting parts, the thickness of said rings increasing in the direction of the cover part.

The drawbacks of the state-of-the-art stopper are avoided by using the stopper described above. The stopper in accordance with the invention does not get damaged during the placing of the post as it has been removed from the post then, which guarantees a long life of the post, because no moisture can penetrate into the post via the stopper once the stopper has been fixed down to the stop of the cover part into the post.

Preferably, the external dimension of the neck part of the stopper with the largest external dimension is somewhat larger than the internal dimension of the post to be sealed -here, a difference in dimension of 0.1-1 mm will do excellently, generally 0.2-0.5 mm - as a result of which the stopper can no longer be removed from the post after it has been fitted into the post definitively.

Since the stopper is generally made of synthetic material or another somewhat deformable material, the external dimension of the stopper

neck part with the largest external dimension is preferably made somewhat larger than the internal dimension of the post to be sealed, as this causes the neck part to be deformed somewhat against the inside of the hollow post when the stopper is driven into the post end down to the cover part, which results in a still better contact between stopper and post and hence in a still better sealing.

With particular advantage, the neck part of the stopper is bevelled at the end opposite the cover part, which makes it easier to put the stopper into the end of the hollow post because the bevelled end provides some guiding.

Moreover, it is advantageous to design the neck part of the stopper slightly conically for a still better fixing in the hollow post to be sealed. With particular advantage, the neck part with the largest external dimension is provided with clamping ribs extending longitudinally of the neck part to offset any dimensional differences of the internal dimension of the cross-section of the post and to ensure that the stoppers that have been placed into the posts definitively can no longer be removed from the posts. These clamping ribs can have a thickness that is constant over their whole length.

As mentioned hereinbefore, the stopper in accordance with the present invention is applied for sealing a hollow post of different shapes. Preferably, the neck part of the stopper is cylinder shaped, and with very great advantage, the neck part is given a flattened cylinder shape. These two embodiments will hereinafter be explained further in the description of the accompanying drawing.

The invention also relates to a method for incorporating a hollow post, such as a fencing post, into a fencing to be erected, the post already having been provided with a stopper before it is placed, that is characterised in that the stopper is a stopper in accordance with the present invention, the part of the stopper with the smallest external dimension having been put into the post in a clamped manner, while the stopper is removed from the post during the operations needed for incorporation and the post is incorporated into the fencing whereupon the stopper is driven down to the cover part into the post.

By applying aforesaid method, a fencing can be made by means of fencing posts that have a longer life than state-of-the-art fencing posts, because after the fencing is formed, the stopper sits undamaged in the post sealing its end excellently.

The invention also relates to a hollow post, such as a fencing post, an open end of which is sealed with a stopper, characterised in that the stopper is a stopper in accordance with the invention, of which the part of the neck part with the smaller external dimension has been incorporated into an end of the hollow post.

Said hollow post, which detachably contains a stopper in accordance with the invention, is a post that is extremely well suited to be used when forming a fencing.

The present invention will hereinafter be explained further with reference to the accompanying drawing in which:

figure 1 represents a side view of a state-of-the-art stopper;

figure 2 represents an embodiment of a stopper in accordance with the present invention;

figure 3 shows a bottom view of the stopper in accordance with figure 2;

figure 4 illustrates a bottom view of a stopper in accordance with the present invention with a neck part with a special shape;

figure 5 represents a view from above of a hollow post that can be sealed by means of a stopper in accordance with figure 4; and

figure 6 represents a side view of the post from figure 5.

Figure 1 represents a state-of-the-art stopper, reference number 1 indicating the whole stopper, 2 the neck part and 3 the cover part. It will be clear that there is only one way to put this stopper into the end of a hollow post, the former sealing so tightly against the inside of the post that the stopper can no longer be removed from the post or only by damaging the stopper.

The material of a stopper or a closure and mounting cap will often be a synthetic material such as nylon, polyvinyl chloride, polyethylene, polypropylene, etc.; polypropylene is applied with advantage.

Figure 2 shows an embodiment of a stopper 1 in accordance with the present invention, the neck part consisting of two parts. Starting from the cover part, first there is a part 2, which corresponds to the neck part 2 of the state-of-the-art stopper, then a part 4 of smaller external dimension than part 2, ribs 5 being located on part 4 that extend longitudinally of the neck part and the thickness of which increases in the direction of the cover part.

Reference number 3 is again the cover part of the stopper. Reference number 6 indicates the bevelled end of the stopper 1 that is located opposite the cover part 3. In the places where hollow posts are manufactured, the stopper 1 can be put with the neck part 4 with the ribs 5 on it into the post, as a result of which the former remains somewhat clamped in the post. The presence of the bevel 6 makes this very easy as this bevel acts as some guide. As already mentioned hereinbefore, it will be clear that many more embodiments of ribs are possible, such as annular radially projecting parts the thickness of which increases in the direction of the cover part. Also, clamping ribs 5' are present on the neck part 2 with the larger external

dimension in order to offset any dimensional differences of the internal diameter of the hollow post to be sealed and that contribute to the fact that stoppers that have been placed into the posts definitively can no longer be removed from them without damaging the stoppers. These clamping ribs 5′ can have a thickness that is constant over their whole length.

In figure 3, which is a bottom view of a circular embodiment of the neck part of the stopper in accordance with the invention, the cover part 3, the neck part 2 of larger external dimension and the neck part 4 of smaller external dimension as well as the ribs 5 and 5′ are again clearly visible. The stopper in accordance with this embodiment is suitable for sealing an end of a hollow cylinder-shaped post.

Figure 4 is another bottom view of a stopper in accordance with the present invention, the neck part being given a flattened cylinder shape as opposed to the cylinder shape of figure 3. The neck parts 2 and 4 and the ribs 5′ present on the neck part 2 and the ribs 5 present on the neck part 4 are also clearly visible. This stopper is suitable for sealing an end of a hollow post 7 in accordance with figure 5 and figure 6. The internal shape of the hollow post substantially corresponds to the external shape of the neck part 2 of the stopper in accordance with figure 4. This post 7 of figure 5 and 6 has a bulge 8 extending longitudinally of the post, to which a netting or another fencing material can be fixed simply by means of clamps. Generally, such a hollow post is a hollow galvanised steel post provided with a synthetic coating. So, stopper 1 of figure 4 is put with the neck part 4 into an end of post 7 by the manufacturer. During the operation steps for erecting or making a fencing, the user can remove the stopper 1 from the post. After the fencing is erected or finished, the stopper 1 can then be driven down to the ledge or the stop of the cover part into the post. As a result, a fencing is obtained in which the hollow posts are very well sealed by stoppers that have not been damaged during the operation steps for erecting or making the fencing. This results in a very long life of the hollow posts and hence of the fencing.

Consequently, a stopper is provided in accordance with the present invention that has an excellent effect for sealing an end of a hollow post and that also cannot be damaged during the operations for forming a fencing, as the stopper can be removed from the post during the operations as opposed to state-of-the-art stoppers.

Claims

1. Stopper for sealing an end of a hollow post, such as a fencing post, comprising a cover part that can rest with a stop against the post end and a neck part that can seal very tightly against the inside of the post, characterised in that, the neck part of the stopper (1) consists of at least two parts of different external dimension, the dimensions of the separate parts increasing viewed in the direction of the cover part (3).

2. Stopper in accordance with claim 1, characterised in that, the neck part of the stopper (1) consists of two parts (2,4), the end part (4) with the smallest external dimension being provided with ribs (5) that extend longitudinally of the neck part and the thickness of which increases in the direction of the cover part (3).

3. Stopper in accordance with claim 2, characterised in that, the greatest thickness of the ribs (5) equals the difference in external dimension of the two neck parts (2,4).

4. Stopper in accordance with claims 1-3, characterised in that, the external dimension of the neck part (2) of the stopper (1) with the largest external dimension is somewhat larger than the internal dimension of the post to be sealed.

5. Stopper in accordance with claims 1-4, characterised in that, the neck part (4) of the stopper (1) is bevelled at the end (6) opposite the cover part (3).

6. Stopper in accordance with claims 1-4, characterised in that, the neck part (2,4) of the stopper (1) is designed slightly conically.

7. Stopper in accordance with claims 1-4, characterised in that, the neck part (2) of the stopper (1) with the largest external dimension is provided with clamping ribs (5′) extending longitudinally of the neck part (2).

8. Stopper in accordance with claims 1-4, characterised in that, the neck part is cylinder shaped.

9. Stopper in accordance with claims 1-4, characterised in that, the neck part is a neck part with a flattened cylinder shape.

10. Method for incorporating a hollow post, such as a fencing post, into a fencing to be erected, the post already having been provided with a stopper before it is placed, characterised in that, the stopper is a stopper in accordance with one or more of the preceding claims 1-9, the part (4) of the stopper (1) with the smallest external dimension having been put into the post in a clamped manner, in that the stopper is removed from the post during the operations needed for incorporation, the post is incorporated into the fencing and the stopper is then driven down to the cover part (3) into the post.

11. Hollow post, such as a fencing post, an open end of which is sealed with a stopper, characterised in that, the stopper is a stopper in accor-

dance with one or more of claims 1-9, of which the part (4) of the neck part with the smallest external dimension has been incorporated into an end of the hollow post.

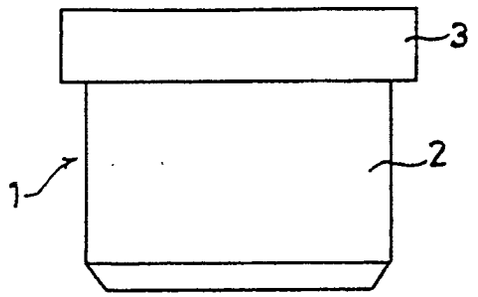

Fig: 1.

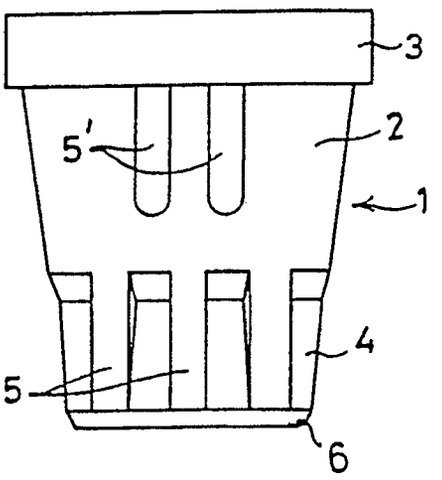

Fig: 2.

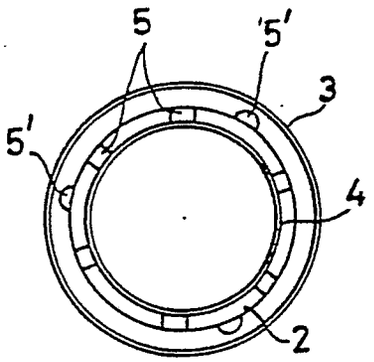

Fig: 3.

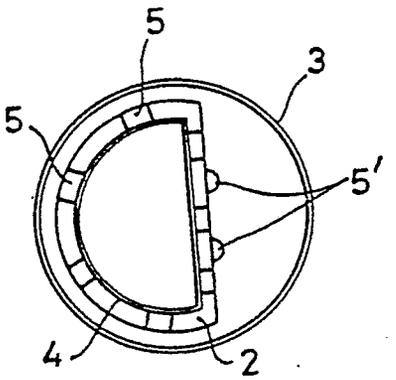

Fig: 4.

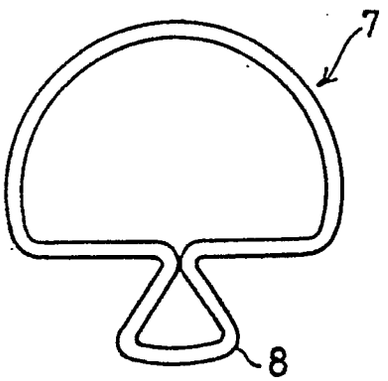

Fig: 5.

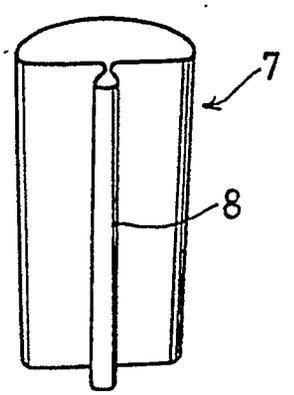

Fig: 6.

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EUROPEAN SEARCH REPORT

Application Number

EP 90 87 0080

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.5)
A	US-A-2 604 291 (SOLLMANN) * Column 1, line 44 - column 2, line 14; figures 1,2,6 *	1,2,4-6,11	E 04 H 17/06

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E 04 H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	03-09-1990	PORWOLL H.P.

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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