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Allen et al.

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[54] **WELL-POINTS FOR DE-WATERING GROUND**

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[63] Continuation of Ser. No. 144,836, May 19, 1971, abandoned.

[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **166/230,** 166/231

[51] **Int. Cl.** **E21b 43/08**

[58] **Field of Search** 166/228, 230, 227, 233, 166/231, 236

[56] **References Cited**

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[57] **ABSTRACT**

A disposable wellpoint for dewatering ground comprises a body of spirally-corrugated perforated tubing formed of plastics material and covered by a filter sleeve of nylon fabric, and a suction pipe of spirally corrugated tubing enters the top end of the body. The body, the sleeve, and the suction pipe can be severed as lengths from supply reels on site, and the assembled wellpoints can be introduced into the ground in a tubular casing provided with water lances.

10 Claims, 2 Drawing Figures

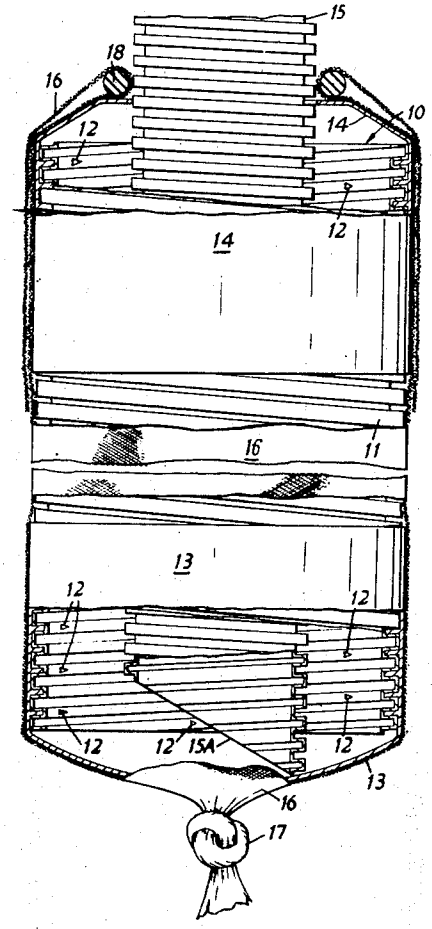
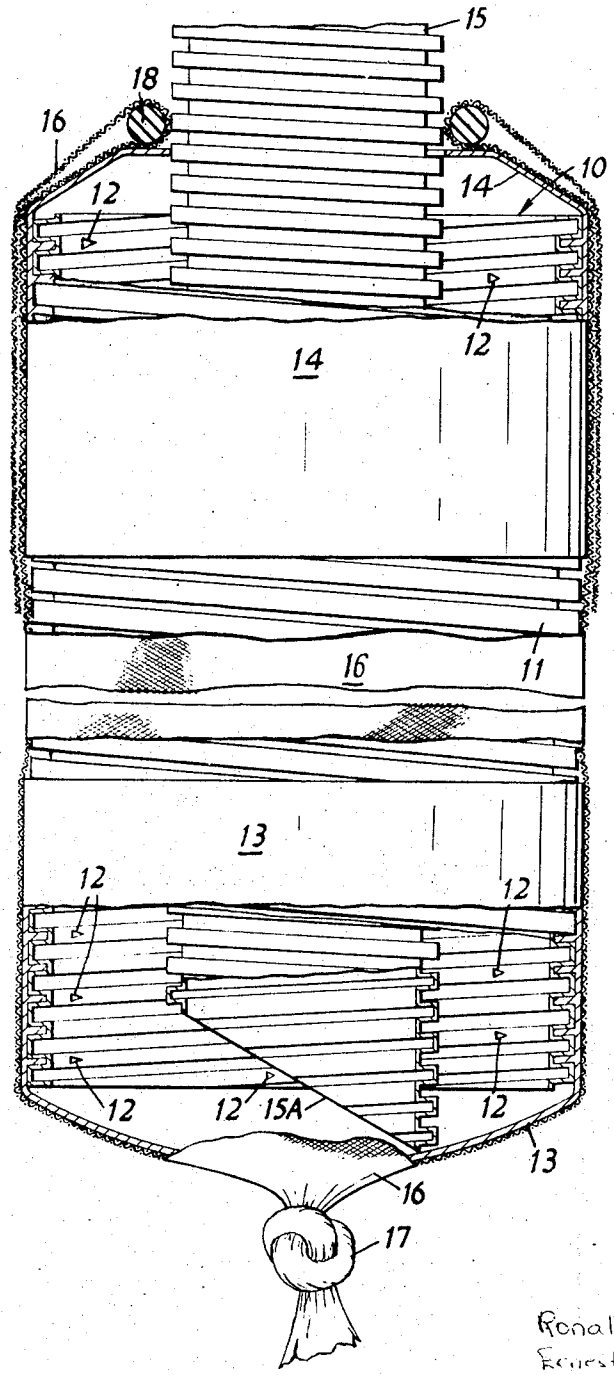


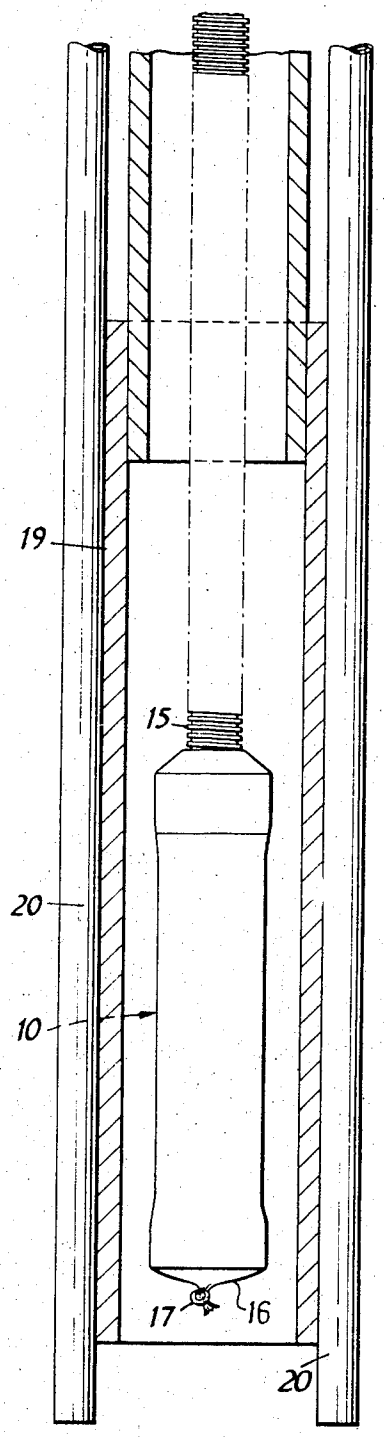
FIG. 1



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FIG. 2



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WELL-POINTS FOR DE-WATERING GROUND

This is a continuation of application Ser. No. 144,836, filed May 19, 1971, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to wellpoints for dewatering ground.

Wellpoints are, of course, well known and most wellpoints are of the general kind described in our British Pat. No. 1,012,282. This known type of wellpoint is relatively expensive, as it must be robustly constructed of corrosion-resistant materials, and difficulty is frequently encountered in withdrawing the wellpoints from the ground after an operating period which may extend over several months or more. Also, the wellpoints, and particularly the filters, must usually be reconditioned before being used again.

Furthermore, conventional wellpoints are heavy to handle and store, and the difficulties involved in storage are further increased where a variety of sizes and types of wellpoint must be stocked to meet the varying site conditions which usually exist to a greater or lesser extent.

It is an object of the present invention to overcome or at least reduce the above disadvantages.

SUMMARY OF THE INVENTION

According to the present invention there is provided a wellpoint comprising a tubular body of shape-sustaining plastics material provided with a lower end closure and an upper end part arranged to receive a suction pipe, said body formed with a series of filter openings, and a sleeve of synthetic fabric or the like surrounding the tubular body to filter water being drawn into the tubular body through said filter opening.

Preferably, said tubular body has a diameter greater than said suction pipe and said upper end part comprises an end cap having a central opening to receive said pipe.

The invention also provides a tubular body as defined above for use in a wellpoint.

Further according to the invention, there is provided a method of producing a wellpoint for dewatering ground, comprising taking from a supply a length of shape-sustaining plastics tubing formed with a series of filter openings, taking from a supply a length of imperforate shape-sustaining plastics tubing of a diameter substantially smaller than that of the perforated tubing, inserting an end length of the imperforate tubing into the upper end of the perforated tubing, effectively closing the still-open ends of the perforated tubing and securing a sleeve of synthetic fabric around the perforated tubing.

According to a further feature of the invention, there is provided a method of dewatering ground comprising introducing a wellpoint as defined above into the ground by means of a hollow tubular casing in which the wellpoint is accommodated, the method including the step of easing the entry of the tubular casing into the ground by means of one or more water lances attached to or integral with the casing, the casing being extracted when the wellpoint has reached its required operating depth.

Other objects and features of the invention will appear from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partly sectional elevation showing a wellpoint according to the invention; and,

FIG. 2 is a diagrammatic sectional elevation showing the wellpoint illustrated in FIG. 1 accommodated in a placement casing provided with water pressure lances.

DESCRIPTION OF THE PREFERED EMBODIMENTS

Referring to FIG. 1 of the drawings, the wellpoint comprises a tubular body **10** consisting of a length of hard plastics tubing, for example P.V.C. The tubing is formed with a spiral corrugation **11**, and series of perforations **12** are formed in the trough of the corrugation to provide coarse filter openings. An unperforated, lower end blanking cap **13** closes one end of the body **10** and an upper end cap **14** formed with a central opening is arranged at the upper end of the body **10.** The end caps are also formed with spiral corrugations, and can thus be screwed onto, or in a modification into, the body **10.** A pipe **15** of similar plastics material, having an angled bottom end **15A**, extends through the upper end cap **14** to penetrate into and, as shown, along the complete length of the body **10.** The pipe **15** is also formed with a strengthening spiral corrugation and may be partly screwed into the opening in cap **14.**

A sleeve of nylon fabric **16** encloses the body **10,** the sleeve being knotted at **17** and being held closely around the pipe **15** where the latter enters cap **14,** by means of a rubber ring **18.**

In use, the wellpoint shown in FIG. **1** is introduced into a tubular casing **19** shown in FIG. **2,** and it will be noted that water pressure lances **20** are secured to the casing **19.** As shown, the casing **19** comprises a lower length of metal tube into which an upper length of smaller-diameter tube is force-fitted or welded. The wellpoint is introduced into the ground by the scouring action of the water from the lances **20,** which eases the passage of the casing **19** through the ground to be dewatered. A certain amount of sand or soil may pass upwardly through the bore of the casing **19** and tend to stop the downward progress of the wellpoint, but such sand and soil are mixed with water to form a slurry and the resistance is not great; furthermore, the wellpoint is sufficiently rigid to be pushed down by pressure from ground level, and, indeed, a metal or like rod may be passed through the tube **15** gently to engage the bottom end cap **13** and so assist downward movement of the wellpoint.

On the wellpoint reaching its required operating depth, the outer casing together with the lances **20** are withdrawn, and the pipe **15** is connected to a header pipe (not shown) which is in turn connected to a suction pump such as that marketed under our Trade Mark VELOVAC or UNIVAC. It will be appreciated that suction through the pipe **15** will cause water from the surrounding ground to be drawn through the nylon sleeve **16** and the perforations **12** into the body **10** and this water, which has been filtered by the nylon sleeve, will be drawn upwardly through pipe **15.** It will also be appreciated that, since there is a reduced pressure within the body **10,** it is not necessary to have hermetically sealed end caps **13** and **14** and, likewise, the suc-

tion will draw the nylon sleeve into close engagement with the pipe **15** where the pipe enters the end cap.

It has been found that, due probably to the corrugation in the body **10**, the nylon sleeve tends to vibrate and this produces a self-cleansing action in the nylon sleeve. Also, the corrugation promotes swirling of the indrawn water to effect clearing of the perforations **12**.

After the dewatering operation has been completed, which may of course take several months, the pipe **15** is withdrawn. The body **10** may also be withdrawn but, since these bodies are relatively inexpensive, they will generally be regarded as disposable and will be left in position in the ground; indeed, more or less of the pipe **15**, which is also inexpensive, may also be left in the ground if its extraction proves difficult.

The drawbacks and disadvantages of conventional wellpoints can thus be at least partly reduced by the arrangement described above. For example, the wellpoints can be produced on site from reels of corrugated tubing which forms the body **10**, reels of corrugated or plain tubing which forms the pipe **15**, and reels of nylon sleeve which forms the sleeve **16**. It has been found satisfactory to employ a body **10** having a diameter of approximately 3 inches, and most known requirements can be met by varying the length and/or the diameter of the body **10**; also, the degree of filtration can be chosen by selecting an appropriate mesh for the nylon sleeve **16**. Furthermore, the materials employed in the wellpoint according to the present invention are lightweight and are corrosion and damp resistant for long periods of time in the ground and in storage.

Modifications may be made, without departing from the scope of the invention. For example, the lower end of the (open) nylon sleeve may be tucked into the tubular body **10** and the end cap **13** then applied to hold the sleeve and render the knot **17** unnecessary; the upper end of the sleeve may likewise be tucked in and held by the cap **14**. The end cap **13**, possibly together with the cap **14**, may also be formed with perforations (if fabric-covered). Furthermore, the end caps **13** and **14** may be formed of similar shape, the upper end cap then being cut, possibly on site, to receive the pipe **15**.

The invention has so far been described in relationship to the dewatering of ground, but the same wellpoint and process may be employed for other purposes, such as providing a more or less temporary stand pipe for water-supply.

We claim:

1. A wellpoint comprising a tubular body of shape-sustaining plastics material provided with a corrugated surface configuration, a separable lower end closure part having a corrugated surface in interleaved engagement with the corrugations of said tubular body for closing the lower end of said body; a separable upper end part having a corrugated surface configuration in interleaved engagement with the corrugations of said tubular body adjacent the upper end of said body, said upper end part defining a central opening, an elongated separable suction pipe extending through said opening into said body substantially along the axis of said tubular body, said suction pipe having a corrugated surface in engagement with the edge of said opening, said body being formed with a series of filter openings, and a sleeve of synthetic fabric surrounding the tubular body and having portions which are separably attached to said wellpoint adjacent said lower end closure part and upper end part respectively to filter water being drawn by said suction pipe into the tubular body through said filter openings.

2. A wellpoint as claimed in claim **1**, in which said tubular body has a diameter greater than that of said suction pipe, said filter openings being defined in the troughs of the corrugations in said tubular body.

3. A wellpoint as claimed in claim **1** in which said tubular body and said suction pipe comprise lengths of hard plastics tubing.

4. A wellpoint as claimed in claim **1**, in which said lower end closure part comprises an end cap which is screwed onto the exterior of said tubular body.

5. A wellpoint as claimed in claim **1** in which said upper end part comprises an end cap which is screwed onto the exterior of said tubular body.

6. A wellpoint as claimed in claim **1**, in which said suction pipe extends along substantially the entire length of said tubular body, said suction pipe having an angled bottom end positioned adjacent said lower end closure part.

7. The wellpoint of claim **1** wherein the corrugations in said tubular body, in said lower end closure part, in said upper end part, and in said suction pipe are all of spiral form.

8. A wellpoint as claimed in claim **1** in which said sleeve comprises a length of tubular, open-ended nylon fabric closely fitted at its upper end around said suction pipe above said top end part and having its lower end closed in engagement with said lower end closure part.

9. The wellpoint of claim **8** wherein the upper end of said sleeve is retained in place by means of a flexible ring surrounding said suction pipe.

10. The wellpoint of claim **8** wherein the lower end of said sleeve is closed by a knot in said fabric below said lower end closure part.

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