(12) UK Patent Application (19) GB (11) 2 259 842 (13) A

(43) Date of A publication 31.03.1993

(21) Application No 9216943.2

(22) Date of filing 10.08.1992

(30) Priority data
(31) 9117188 (32) 08.08.1991 (33) GB

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(51) INT CL[5]
A01G 9/02

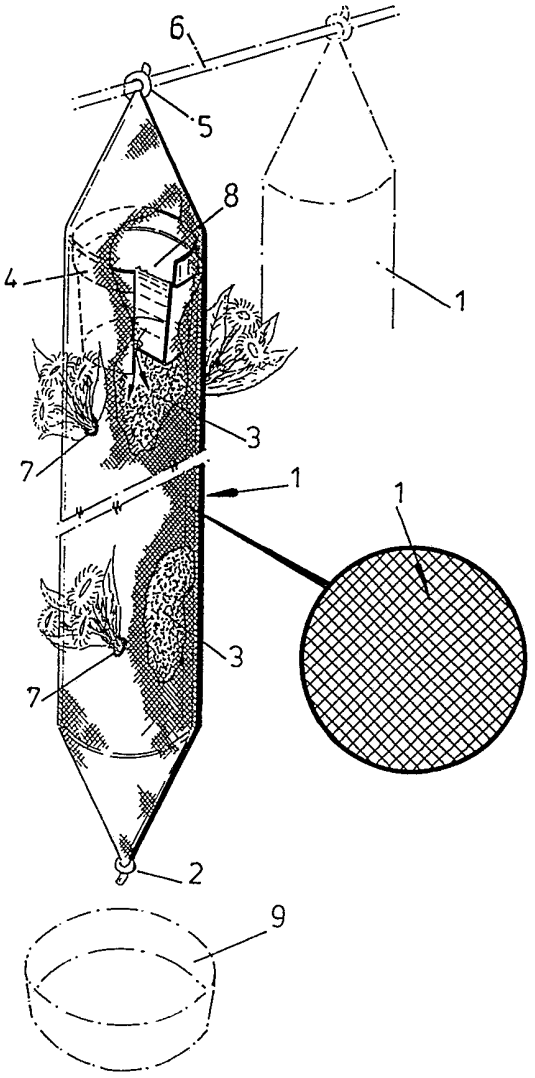
(52) UK CL (Edition L)
A1E EAKX EK19 EK23 EK26

(56) Documents cited
GB 2199224 A GB 2170688 A GB 2147484 A
GB 2070403 A GB 2055281 A EP 0235937 A
US 4986027 A

(58) Field of search
UK CL (Edition K) A1E EAKA EAKX
INT CL[5] A01G

(54) Hanging bag for growing plants

(57) A bag for growing plants is tubular in shape and is adapted to be supported vertically when in use. The bag comprises an open ended tube 1 fabricated from polypropylene fibre knitted in a stockinette structure. Once filled with a growing substrate 3 the ends of the tube 1 are sealed by knotting. The stockinette bag can be readily ported 7 to facilitate both the implantation of a seed or the like and the growth of a plant. Because the bag is supported vertically it occupies only a fraction of the area of a similar sized conventional grow bag.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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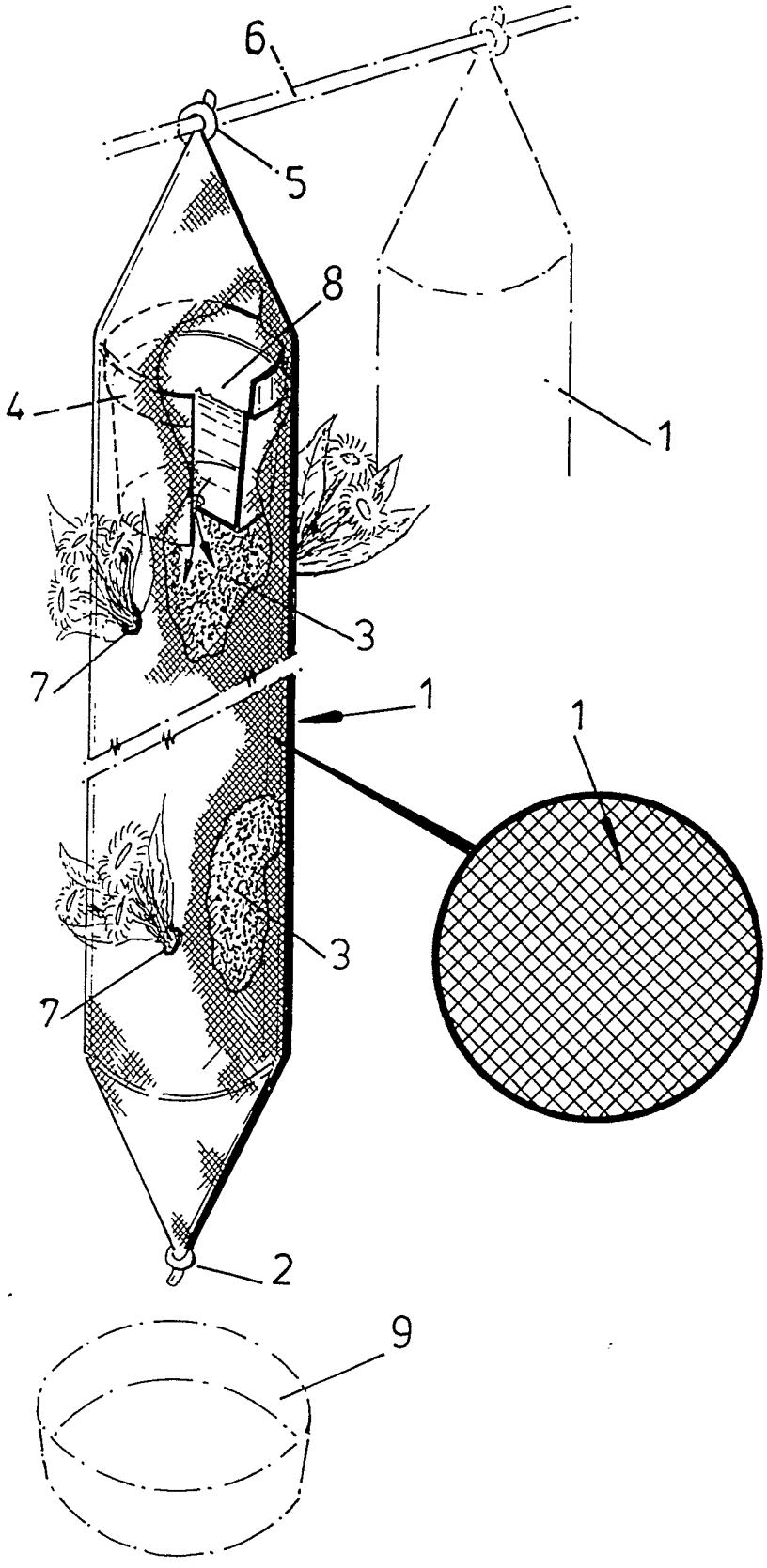
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BAG FOR GROWING PLANTS

The present invention relates to a bag for growing plants.

Bags for growing plants are known, generally being referred to as grow-bags. Typical grow-bags in common usage comprise a pillow shaped bag made from a plastics material and containing soil and/or compost. Such bags are designed to be laid on a substantially flat surface and then punctured through the upper surface to expose the soil/compost and allow a seed to be planted therein. Individual holes can be formed in the bag for each individual seed, or larger holes for groups of seeds, alternatively the bag can be torn in rows to facilitate the planting of seeds in rows. The seeds/plants are watered in a conventional manner, the water entering the grow bag through the regions where it has been punctured and the soil/compost exposed.

It is an object of the present invention to provide an improved grow-bag.

According to the present invention there is provided a bag for growing plants wherein the bag has a tubular construction and, in use, is adapted to be supported vertically, the bag being constructed such that it can be ported to facilitate both the implantation of a seed or the like and the growth of a plant.

Preferably the bag is constructed in lengths open at each end. The bag can then be cut to any required length, filled with a suitable substrate, eg compost, and then the ends subsequently sealed as required. Sealing may be achieved simply by tying a knot in the appropriate end of the bag.

In use, the bag is supported vertically and ports are formed in its walls to facilitate the planting of a seed or the like and the subsequent growth of a plant.

Preferably the bag is supported vertically by suspending it from one end thereof from an appropriate support structure. The support structure may be a specifically designed support frame or any convenient existing support suitably adapted.

The bag is preferably formed from a material that permits ready formation of the necessary ports but is strong enough to support the

weight of the growing substrate when the bag is suspended from one end.

Preferably the bag is formed from a perforated material that permits the ingress and egress of water. For example the bag may be formed from polypropylene fibre knitted in a stockinette structure. Ports may then be formed simply by laddering the bag.

Preferably the bag has reinforcing bands spaced along its length which prevent the formation of a ladder across respective bands. Thus, a ladder formed in any part of the bag is prevented from spreading along the full length of the bag, the length of the ladder being limited to the spacing of adjacent reinforcing bands. This facilitates a greater freedom of choice over the location of the ports.

Preferably the reinforcing bands are knitted into the stockinette bag as the bag is formed.

Preferably the reinforcing bands are knitted from a fibre which has a lower melting point than the fibre from which the bag is formed, for example an acrylic, so that the reinforcing bands can be fused with the fibres of the bag by the application of heat, which fusing increases the strength of the reinforcement.

Water may be introduced into the bag by allowing it to drip at a controlled rate into the top end of the bag when supported vertically. Alternatively, a receptacle having a porous bottom and/or sides can be located within the bag at its top end to receive a volume of water, the porous bottom and/or sides then allowing water to drain, at a relatively controlled rate, into the growing substrate. In each case, excess water will drain from the bottom of the bag and may be collected in a receptacle. The water so collected may be reintroduced into the top of the bag.

In an alternative embodiment of the invention an open ended tubular sleeve constructed from a water proof material may be provided between the internal walls of the bag and the growing substrate so as to reduce the amount of water lost from the bag by evaporation.

Preferably the unrestricted diameter of the sleeve is greater than the diameter of the bag so that it will not restrict the pressure exerted by the growing substrate on the internal wall of the bag. Alternatively the sleeve could be constructed from an elastomeric

material with a maximum possible diameter greater than that of the bag.

Preferably the sleeve is formed from a material that may be readily pierced to provide the necessary ports, for example the sleeve may be constructed from polythene.

A specific embodiment of the invention will now be described, with reference to the accompanying drawing, which is a part sectioned perspective illustration of a grow bag according to the present invention in use.

Referring to the drawing, the bag comprises an open ended tube 1 fabricated from polypropylene fibre knitted in a stockinette structure. This material is chosen because it has the necessary strength and required porosity. It will be appreciated, however, that there are other suitable materials that could be used. The tube 1 can be manufactured in continuous lengths which can then be cut to any required length for use. When not in use, the elastomeric nature of the polypropylene fibre allows a length of tube 1 to be rolled up into a ring for convenient storage.

In use, the tube 1 is first cut to the required length and then sealed at one end, which is to be the bottom end, by tying a knot 2. The tube is then filled with a suitable growing substrate, for example compost 3. A plant pot 4 is then inserted upright into the top end of the tube 1 and bedded down into the compost 3. The top end of the tube 1 is then sealed by tying a knot 5 and the bag is suspended from a suitable structure 6, indicated schematically in the drawing. For instance, the upper end of the tube 1 can simply be tied to the structure 6, as shown, or it can be hooked over a suitable formation (not shown), such as a hook, provided on the structure 6.

The knitted structure of the bag is such that if the tube 1 is cut it will ladder in a longitudinal direction along its length. In this manner ports 7 are formed in the tube 1 of a size sufficient to facilitate the insertion of a seed or root ball into the compost 3, and to allow a plant to grow therethrough. The laddering process is aided by the pressure exerted by the compost 3 on the internal wall of the bag. The ports could alternatively be formed by cutting or otherwise.

With the structure described above, once a ladder is initiated in the tube 1 it will spread along the length of the tube with the

result that seeds can only be planted in vertical rows. In an alternative embodiment to that shown in the drawing, the tube 1 may have reinforcing bands spaced at intervals along its length to limit the length to which a given ladder can spread. Thus, the length of any given ladder will be limited to the spacing of adjacent reinforcing bands. The position of separate ladders may then be staggered around the tube giving a greater freedom of choice in the location of the seeds etc.

Such reinforcing bands may be formed into the tube 1 as it is manufactured. For instance, the reinforcing bands could be formed from acrylic fibre knitted into the polypropylene stockinette tube. The tube could then be heat treated to fuse the relatively low melting point acrylic fibre to the polypropylene fibre forming a strong reinforcing band.

Any desired number or arrangement of ports 7 can thus be formed in the tube 1.

Water is supplied to the seeds/plants by means of the plant pot 4 which functions as a reservoir. The plant pot 4 is filled with water 8 which then feeds into the compost 3 at a steady rate through one or more holes (not shown) provided in the base and/or sides of the plant pot 4. The water passes down the length of the tube 1 through the compost 3 and in this manner is provided to the seeds/plants growing in the bag. Excess water drains out of the bottom of the tube 1 and is collected in a suitable receptacle 9. The plant pot 4 is topped up periodically as the water level therein drops. The water collected in the receptacle 9 may be used to top up the plant pot 4. It will be appreciated that the described and illustrated method of supplying water to the bag utilising the plant pot 4 represents only one possible alternative. For instance, water could be drip fed into the bag from a source external to the bag using any suitable arrangement.

As a modification to the above described embodiment of the invention, an open ended tubular sleeve constructed from a water proof material may be inserted into the bag before it is filled with compost so that it lies between the compost and the internal vertical wall of the bag when the bag is filled. This will reduce the amount of water lost from the bag by evaporation but, because the sleeve is

open ended, will not prevent water being fed into the top of the bag or draining out the bottom. It is preferable that the unrestricted maximum diameter of the sleeve is greater than that of the bag so as not to restrict the pressure exerted by the compost on the wall of the bag, which would adversely affect the ease with which the bag is laddered. The sleeve must be constructed from a material that can be readily pierced to allow formation of the required ports. An example of a suitable material for constructing the sleeve is polythene. This modification of is of particular use in applications where the supply of water is limited, for example in arid countries.

Grow bags according to the present invention posses a number of significant advantages over the prior art. The most important advantage offered by the invention is that because the bags are adapted to be supported vertically they occupy a fraction of the surface area that would be occupied by a similarly sized conventional grow bag. Therefore a relatively large number of vertical grow bags can be provided for any given growing area. Thus, a much higher crop yield per unit surface area can be achieved than is possible with the prior art. The invention is therefore of great benefit for applications where available area is limited or where for commercial or other reasons a particularly high crop yield per unit area is desired. For example, the invention particularly lends itself to use in hydroponic growing systems.

Furthermore, because excess water supplied to the bags can be readily collected as it drains from the bag and then fed back in to the top of the bag, the invention is extremely beneficial in applications where water is in short supply, for example for crop growth in arid countries.

Because the bags are adapted to be suspended well clear of the ground the invention also offers advantages over the prior art in areas susceptible to flooding. Similarly, plants growing in the vertically suspended bags are protected from ground insects.

CLAIMS

1. A bag for growing plants wherein the bag has a tubular construction and, in use, is adapted to be supported vertically, the bag being constructed such that it can be ported to facilitate both the implantation of a seed or the like and the growth of a plant.

2. A bag according to claim 1, wherein the bag is constructed in lengths open at each end.

3. A bag according to claim 2, wherein in use the bag is cut to a required length, filled with a suitable substrate and then the ends of the bag are sealed.

4. A bag according to claim 2 or 3, wherein in use the ends of the bag are sealed by tying a knot in the respective end of the bag.

5. A bag according to any preceding claim, wherein in use the bag is supported vertically by suspending it from one end thereof from an appropriate support structure.

6. A bag according to claim 5, wherein the support structure is a specifically designed support frame.

7. A bag according to any preceding claim, wherein the bag is formed from a material that permits ready formation of the said ports and is strong enough to support its weight when filled with growing substrate and suspended from one end.

8. A bag according to claim 7, wherein the bag is formed from a perforated material that permits the ingress and egress of water.

9. A bag according to claim 8, wherein the bag is formed from polypropylene fibre knitted in a stockinette structure.

10. A bag according to claim 9, wherein in use the said ports are formed by laddering the bag.

11. A bag according to claim 10, wherein the bag has reinforcing bands spaced along its length which prevent the formation of a ladder across the respective bands.

12. A bag according to claim 11, wherein the reinforcing bands are knitted into the stockinette bag as the bag is formed.

13. A bag according to claim 11 or 12, wherein the reinforcing bands are formed from a fibre which has a lower melting point than the fibre from which the bag is formed so that the reinforcing bands can be fused with the fibres of the bag by the application of heat, which

fusing increases the strength of the reinforcement.

14. A bag according to claim 13, wherein the reinforcing bands are formed from an acrylic fibre.

15. A bag according to any preceding claim, wherein in use a receptacle having a porous bottom and/or sides is located within the bag at its top end to receive a volume of water, the porous bottom and/or sides then allowing water to drain into growing substrate contained within the bag.

16. A bag according to any preceding claim, wherein in use excess water which drains from the bottom of the bag is collected in a receptacle.

17. A bag according to claim 16, wherein excess water so collected is reintroduced into the top of the bag.

18. A bag according to any preceding claim, wherein an open ended tubular sleeve constructed from a water proof material is provided between the internal walls of the bag and the growing substrate with which the bag is in use filled, so as to reduce the amount of water lost from the bag by evaporation.

19. A bag according to claim 18, wherein the unrestricted diameter of the sleeve is greater than the diameter of the bag so that it will not restrict the pressure exerted by the growing substrate on the internal wall of the bag.

20. A bag according to claim 18, wherein the sleeve is constructed from an elastomeric material with a maximum possible diameter greater than that of the bag.

21. A bag according to any one of claims 18, 19 and 20, wherein the sleeve is formed from a material that may be readily pierced to provide the said ports.

22. A bag according to claim 21, wherein the sleeve is constructed from polythene.

23. A bag for growing plants substantially as hereinbefore described with reference to the accompanying drawing.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number
GB 9216943.2

Relevant Technical fields

(i) UK Cl (Edition K) A1E (EAKA; EAKX)

(ii) Int Cl (Edition 5) A01G

Search Examiner
K J KENNETT

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search
15 DECEMBER 1992

Documents considered relevant following a search in respect of claims 1-23

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2199224 (GARDEN HAVEN) Whole document	1-3, 5, 7 and 16
X	GB 2170688 (CAMERON) Whole document	1-3, 5, 7, 8, 15-17
X	GB 2147484 (GREEN) Whole document	1-3, 5, 7, 15, 16
X	GB 2070403 (HOWEILL) Whole document	1, 5, 7
X	GB 2055281 (HAGO) Whole document	1
X	EP 0235937 (GERETECH) Figure 20	1-3, 5 and 7
X	US 4986027 (HARVEY) Whole document	1-3, 5, 7-9

Category	Identity of document and relevant passages	Relevant to claim(s.

Categories of documents

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P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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