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Patents Act 1990

PATENT REQUEST: STANDARD PATENT/PATENT OF ADDITION

We, being the person(s) identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying standard complete specification.

Full application details follow.



[71] SECTION 113 DIRECTION SEE FOLIO 13
NAME DIRECTED Plastro - Gvat Marketing (1990) Ltd
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Address: ~~Kibbutz Gvat, 30.050 Doar Gvat, Israel~~

[54] Invention Title: STATIC SPRAYER INCLUDING PROTECTIVE COVER

[72] Name(s) of actual inventor(s): VALISH MALKIN

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BASIC CONVENTION APPLICATION(S) DETAILS

[31] Application Number 102693
[33] Country ISRAEL
Country Code IL
Date of Application 31.07.92

Drawing number recommended to accompany the abstract: 1

DATED this 30th day of July 1993

PLASTRO-GVAT

By:


Registered Patent Attorney

TO: THE COMMISSIONER OF PATENTS
AUSTRALIA

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PATENTS ACT 1990

NOTICE OF ENTITLEMENT

We, PLASTRO-GVAT MARKETING (1990) LTD of Kibbutz Gvat, 30 050 Doar Gvat, Israel, being the applicant and nominated person in respect of Application No. 44375/93, state the following:-

The person nominated for the grant of the patent has entitlement from the actual inventor VALISH MALKIN by virtue of the following:

The said inventor assigned his rights in the invention to PLASTRO-GVAT who in turn assigned all their rights to PLASTRO-GVAT MARKETING (1990) LTD by virtue of an Assignment

The person nominated for the grant of the patent has entitlement from the applicant of the basic application listed on the patent request form

The basic application listed on the request form is the first application made in a Convention country in respect of the invention

PLASTRO-GVAT MARKETING (1990) LTD

By their Patent Attorneys

CULLEN & CO.


RON HALIDAY

Date: 23 November 1995



AU9344375

(12) PATENT ABRIDGMENT (11) Document No. AU-B-44375/93
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 666026

- (54) Title
STATIC SPRAYER INCLUDING PROTECTIVE COVER
- International Patent Classification(s)
(51)⁵ B05B 015/00
- (21) Application No. : 44375/93 (22) Application Date : 30.07.93
- (30) Priority Data
- | | | |
|-------------|-----------|--------------|
| (31) Number | (32) Date | (33) Country |
| 102693 | 31.07.92 | IL ISRAEL |
- (43) Publication Date : 03.02.94
- (44) Publication Date of Accepted Application : 25.01.96
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- (56) Prior Art Documents
EP 10925
GB 2173714
US 3221995
- (57) Claim

1. A static sprayer, comprising: a housing mountable in a vertical position and including a water inlet at the lower end of the housing, a water discharge outlet at the upper end of the housing, a vertically-extending passageway within the housing connecting the water inlet to the water discharge outlet, and a static diverter fixed to the housing for receiving the water from the vertically-extending passageway and for diverting the water laterally through the water discharge outlet and laterally of the housing, said diverter defining said discharge outlet in a fixed annular configuration; characterized in that said static sprayer further comprises: a cover mounted at the upper end of the housing over said diverter and movable vertically through a linear path towards and away from said diverter to cover and uncover said water discharge outlet; and a constraining device permitting the cover to move away from the water discharge outlet a limited amount when water is discharged therefrom, and permitting the cover to move by gravity towards said water discharge outlet to cover it when water is not discharged therefrom to thereby inhibit the entry of insects or other foreign objects into the sprayer.

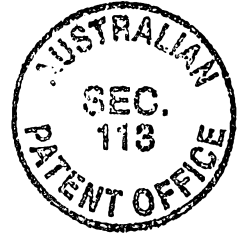
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COMPLETE SPECIFICATION
FOR A STANDARD PATENT



Name of Applicant(s): PLASTRO-GVAT Marketing (1990) Ltd

Actual Inventor(s): VALISH MALKIN

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Australia.

Invention Title: STATIC SPRAYER INCLUDING
PROTECTIVE COVER

The following statement is a full description of this invention,
including the best method of performing it known to us:

STATIC SPRAYER INCLUDING PROTECTIVE COVER

The present invention relates to static sprayers such as are used for irrigating crops. The invention is particularly directed to a static sprayer including a protective cover to protect the sprayer from entry of insects or other foreign objects during non-operating periods of the sprayer.

Water irrigation sprayers and sprinklers are frequently left in the field for long periods of non-use. During such non-use periods, insects attracted by moisture within the sprayer or sprinkler tend to clog their discharge outlets. Such clogging of the sprayers or sprinklers by insects, or by the accumulation of other foreign objects during long periods of non-use, may result in the malfunction, or at least in the need for frequent cleaning, of the sprayers or sprinklers. In the case of rotary sprinklers, this problem has been addressed by mounting the rotary deflector of the sprinkler in such manner permitting it to drop by gravity to cover the discharge outlet when the sprinkler is not in use.

An object of the present invention is to provide a static sprayer with protection against the entry of insects or other foreign objects during long periods of non-use.

According to the present invention, there is provided a static water sprayer comprising: a housing mountable in a vertical position and including a water inlet at the lower end of the housing, a water discharge outlet at the upper end of the housing, a vertically-extending passageway within the housing connecting the water inlet to the water discharge outlet, and a static diverter fixed to the housing for receiving the water from the vertically-extending passageway and for diverting the water laterally through the water discharge outlet and laterally of the housing, the diverter defining the discharge outlet in a fixed annular configuration; characterized in that the static sprayer further comprises: a cover mounted at the upper end of the housing over the diverter and movable



vertically through a linear path towards and away from the diverter to cover and uncover the water discharge outlet; and a constraining device permitting the cover to move away from the water discharge outlet a limited amount when water is discharged therefrom, and permitting the cover to move by gravity towards the water discharge outlet to cover it when water is not discharged therefrom to thereby inhibit the entry of insects or other foreign objects into the sprayer.

Fig. 1 is an exploded view illustrating one form of static sprayer constructed in accordance with the present invention;

Fig. 2 is an assembled view of the static sprayer of Fig. 1, the sprayer being shown in its operating condition;

Fig. 3 diagrammatically illustrates the operation of the static sprayer of Figs. 1 and 2; and

Figs. 4-6 are views corresponding to those of Figs. 1-3, respectively, but illustrating a second form of static sprayer constructed in accordance with the present invention.

Figs. 1-3 illustrate one form of static sprayer incorporating the present invention. The illustrated static sprayer includes a housing 2 secured to the upper end of a stand 4 for mounting the housing in a vertical position. Housing 2 and stand 4 may be integrally formed as a single unit, e.g., by injection moulding, to also include a water inlet 6 at the lower end of the housing connectible to a water supply line (not shown). A cap 8 is threadedly applied to the upper end of the housing.

Cap 8 is formed at its upper end with a vertically-extending passageway in the form of a nozzle 10 through which the water flows as a vertical jet. Nozzle 10 is circumscribed by a collar 12 which receives a cylindrical wall 14. This cylindrical wall is fixed to cap 8 in any suitable manner, e.g., by a force-fit or threaded-fit over collar 12, so that the cylindrical wall coaxially encloses, and is fixed to, nozzle 10.



A water diverter, in the form of a deflector 16, is fixed by a plurality of bridges 18 to the upper end of the cylindrical wall 14 in vertical alignment with nozzle 10 and spaced above the cylindrical wall to define an annular water discharge outlet 20 extending peripherally around the sprayer housing 2. The undersurface of deflector 16 is of conical configuration and is formed with a plurality of radially-extending ribs, as shown at 20a, to divert the water outletted from nozzle 10 laterally through the annular water discharge outlet 20.

A socket 22 is integrally formed in the upper face of deflector 16 for mounting a pin 24 and a cover 26. Pin 24 is formed with a shank 24a received, as by a force-fit, into socket 22, and terminates at its outer end in an enlarged head 24b. Cover 26 includes a central flat section 26a, formed with a central hole 26b, and an outer conical section 26c.

The diameter of hole 26b in cover 26 is larger than that of the pin shank 24a, but smaller than that of the enlarged head 24b. Thus, pin 24 serves as a constraining device permitting the cover to move by gravity towards the water discharge outlet 20 to cover it when the sprayer is not in use, and to move away from the water discharge outlet a limited amount, limited by head 24b, to allow water to be discharged from the water sprayer during operation of the sprayer.

Thus, during non-operational periods of the water sprayer, the cover 26 drops by gravity onto the top of the deflector 16, such that the conical section 26c of the cover encloses and thereby covers the annular water discharge outlet 20, preventing insects or other foreign objects from entering the water discharge outlet. However, as soon as pressurized water is applied to the sprayer, the water discharged from the annular outlet 20, between the cylindrical wall 14 and the deflector 16, impinges against the inner surface of the conical section 26c of the cover 26, to raise the cover and thereby to permit the water to be

discharged via the annular discharge outlet 20, as shown in Fig. 2 of the drawings.

Hole 26b in the central section 26a of the cover 26 is of significantly larger diameter than shank 24a of the pin 24 such that the interior of the cover is vented to the atmosphere during periods of non-use of the sprinkler. This permits water trapped in the sprayer, particularly between the underface of the cover 26 and the water discharge outlet 20, to drain through the sprayer.

The sprayer illustrated in Figs. 4-6 is also a static sprayer having a diverter, an annular discharge outlet, and a cover covering the outlet during non-use of the sprayer. In this case, however, the diverter producing the annular discharge from the sprayer is a vortex chamber, rather than a conical deflector as in the sprayer of Figs. 1-3; also, the cover movements are constrained by a cage rather than by a pin.

Thus, the static sprayer illustrated in Figs. 4-6 includes a housing 102 which is adapted to be mounted in a vertical position, e.g., by a stand such as shown at 4 in Fig. 1. As shown particularly in Fig. 6, housing 102 includes an inlet 106 at its lower end for inletting the water, and a vertically-extending passageway 108 which directs the water substantially tangentially into a vortex chamber 110 defined by a cylindrical wall 112 secured to the upper end of the housing. The upper end of cylindrical wall 112 is cut with a plurality of slots 114 (Figs. 4 and 5) extending substantially tangentially to the cylindrical wall through which the water is discharged. Slots 114 thus define an annular discharge outlet extending peripherally around the sprayer housing 102.

A cage, generally designated 120, is secured to the upper end of diverter chamber 110 to circumscribe the cylindrical wall 112 defining the annular discharge outlet of the sprayer. Cage 120 includes a disc 121 secured, e.g., by adhesive, to the upper surface of wall 112 of the vortex chamber 110 and formed with a central opening 122 enclosing

the outer face of cylindrical wall 112. Cage 120 is further formed with a plurality of vertically-extending legs 123 converging at their upper ends and joined to a central disc 124.

5 A protective cover 130 is disposed within cage 120 so as to overlie the upper end of cylindrical wall 112 of the sprayer. Cover 130 includes a central flat section 130a formed with a plurality of holes 130b, and an outer conical section 130c.

10 It will thus be seen that the cage serves as a constraining device which, in the absence of a water discharge from the sprayer, permits the cover 130 to move by gravity to cover the water discharge outlet (namely the annular array of slots 114 formed in the upper surface of
15 the vortex chamber wall 112) and thereby to prevent the entry of insects or other foreign objects into the sprayer. However, when pressurized water is inletted into the sprayer, the water discharged from the slots 114 laterally around the sprayer impinges against the inner surface of the
20 conical section 130c of cover 130, and moves the cover upwardly a limited amount, limited by the upper disc section 124 of the cage, to permit the water to be discharged from the sprayer as shown in Fig. 5.

25 The holes 130b in the central section 130a of the cover 130 vent the interior of the cover to the atmosphere, and thereby permit water trapped in the sprayer, particularly between the underface of the cover and the water discharge outlet (slots 114 at the upper end of the vortex chamber wall 112), to drain through the sprayer.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A static sprayer, comprising: a housing mountable in a vertical position and including a water inlet at the lower end of the housing, a water discharge outlet at the upper end of the housing, a vertically-extending passageway within the housing connecting the water inlet to the water discharge outlet, and a static diverter fixed to the housing for receiving the water from the vertically-extending passageway and for diverting the water laterally through the water discharge outlet and laterally of the housing, said diverter defining said discharge outlet in a fixed annular configuration; characterized in that said static sprayer further comprises: a cover mounted at the upper end of the housing over said diverter and movable vertically through a linear path towards and away from said diverter to cover and uncover said water discharge outlet; and a constraining device permitting the cover to move away from the water discharge outlet a limited amount when water is discharged therefrom, and permitting the cover to move by gravity towards said water discharge outlet to cover it when water is not discharged therefrom to thereby inhibit the entry of insects or other foreign objects into the sprayer.

2. The static sprayer according to Claim 1, wherein said water discharge outlet extends peripherally around the sprayer housing to discharge the water in the form of an annular spray around the housing, and said cover includes an outer section adapted to cover said annular water discharge outlet.

3. The static sprayer according to Claim 2, wherein said outer section of the cover is of conical configuration.

4. The static sprayer according to any one of Claims 1-3, wherein said constraining device includes a pin having a shank secured vertically to the upper end of said diverter and an enlarged head at the upper end of said pin; said cover having a central hole larger than the shank of said pin but smaller than said enlarged head.



5. The static sprayer according to Claim 4, wherein said central hole in the cover is significantly larger than the shank of the pin such as to vent the interior of the cover to the atmosphere and thereby to permit water trapped between the underface of the cover and the water discharge outlet to drain through the sprayer.

6. The static sprayer according to any one of Claims 1-5, wherein said diverter is a deflector having an undersurface of conical configuration to deflect the water outletted from said vertically-extending passageway laterally through said water discharge outlet.

7. The static sprayer according to any one of Claims 1-3, wherein said constraining device includes an open cage secured to the upper end of said diverter and enclosing said cover.

8. The static sprayer according to Claim 7, wherein said cover is formed with a plurality of holes to vent the interior of the cover to the atmosphere, and thereby to permit water trapped between the underface of the cover and the water discharge outlet to drain through the sprayer.

9. The sprayer according to either of Claims 7 or 8, wherein said diverter includes a cylindrical wall defining a vortex chamber; the upper end of said cylindrical wall being formed with a plurality of slots extending substantially tangentially to said vortex chamber to define said water discharge outlet; said cage being secured to the upper end of said cylindrical wall.

10. A static sprayer substantially as herein described with reference to the accompanying drawings.

DATED this 30th day of July 1993

PLASTRO-GVAT Marketing (1990) Ltd.

By their Patent Attorneys

CULLEN & CO.



STATIC SPRAYER INCLUDING PROTECTIVE COVER

ABSTRACT OF THE DISCLOSURE

A static sprayer includes a housing 2 mountable in a vertical position, a diverter 16 fixed to the housing for diverting the water from a vertically-extending passageway 10 within the housing laterally through the water discharge outlet 20 at the upper end of the housing, and a cover 26 mounted for vertical movement at the upper end of the housing towards and away from the diverter to cover and uncover the water discharge outlet.

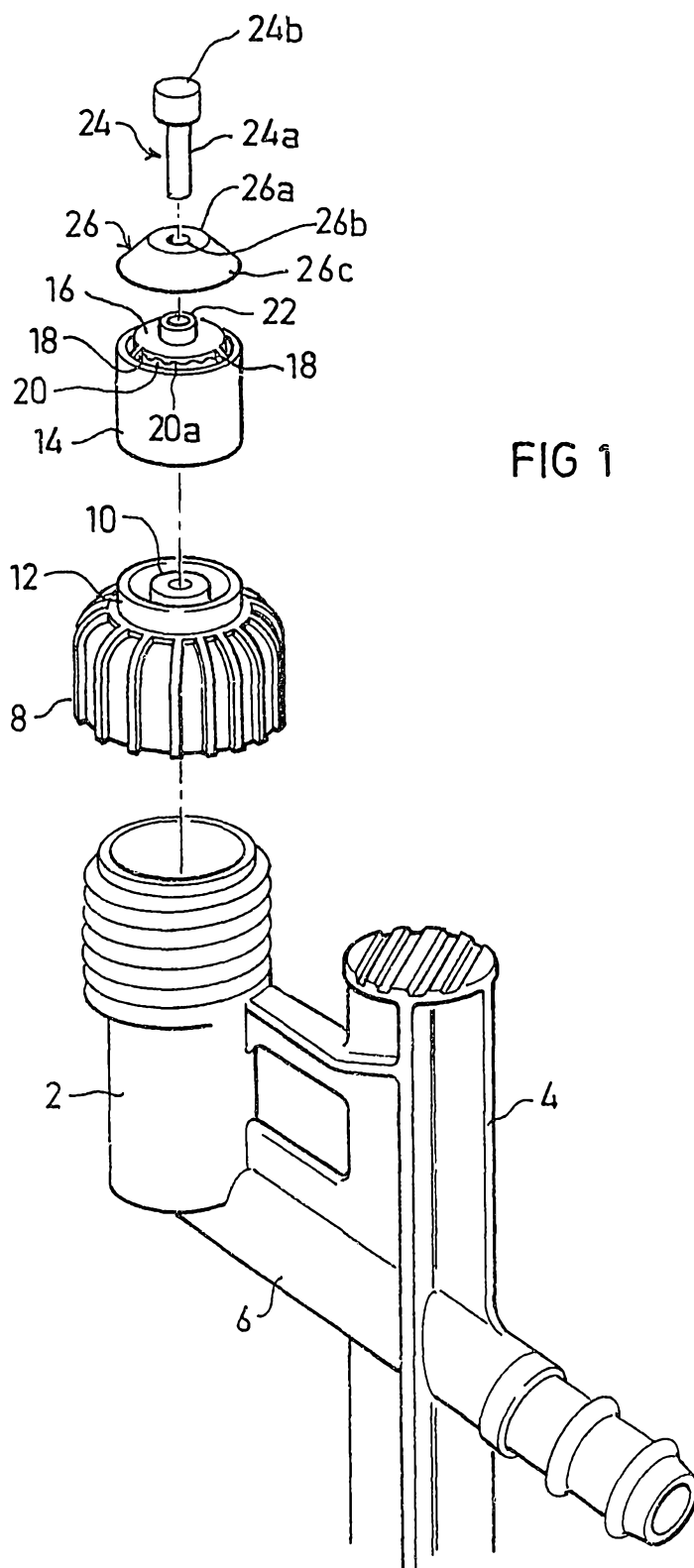


FIG 1

