ABSTRACT

A LOW FLOW Emitter WITH ECHELON SHAPED TEETH

Disclosed is an emitter comprising a plurality of holes 106, running along a first edge 102 and a second edge 104 of the emitter. The emitter 100 may further comprise of an echelon shaped teeth portion 114. The echelon shaped teeth portion may run parallel to the first edge 102 and the second edge 104. Further the echelon shaped teeth portion 114 at least partially extends between the first side 110 and the second side 112.

To be published with Figure 1
WE CLAIM:

1. An emitter 100, comprising:
   a plurality of holes 106, running along a first edge 102 and a second edge 104 of the emitter 100; and
   an echelon shaped teeth portion, running parallel to the first edge and the second edge, wherein the echelon shaped teeth portion at least partially extends between a first side and a second side.

2. The emitter of claim 1, wherein a gap between two consecutive teeth of the echelon teeth shaped portion is substantial to provide increased cross-section.

3. The emitter of claim 1, wherein the emitter comprises a front flow-path, having a discharge rate of 0.348357 Liters per hour.

4. The emitter of claim 1, wherein the emitter comprises a middle flow-path, having a discharge rate of 0.347652 Liters per hour.

5. The emitter of claim 1, wherein the emitter comprises a back flow-path, having a discharge rate of 0.348174 Liters per hour.

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Mahua Roy Chowdhury
Agent for Applicant
IN/PA-496
A LOW FLOW Emitter WITH Echelon SHAPED TEETH

TECHNICAL FIELD

[001] The present subject matter described herein, in general, relates to drip irrigation, and more particularly to an emitter used in the drip irrigation.

BACKGROUND

[002] Conventionally, achieving low flow in an emitter involves minimizing the cross sectional area of the flow path. There are two ways to reduce the cross sectional area of the flow path, i.e. either by lowering the ceiling or by minimizing teeth gap. The flow in the flow path is disrupted by inserting teeth. The problem with the above methods of reducing the cross sectional area of flow path is increasing the likelihood of the flow path clogging. Clogging happens when small particles entering from the inlet gets accumulated in microscopic openings. The end result is that water no longer flows in the flow path, rendering the emitter un-usable.

SUMMARY

[003] This summary is provided to introduce aspects related to an emitter and the aspects are further described below in the detailed description. This summary is not intended to identify essential features of the claimed subject matter nor is it intended for use in determining or limiting the scope of the claimed subject matter.

[004] In one implementation an emitter is disclosed. The emitter may comprise a plurality of holes. The plurality of holes may run parallel to a first edge of the emitter and a second edge of the emitter. Further, the emitter may comprise of an echelon shaped teeth portion. The echelon shaped teeth portion may at least partially extend between a first side of the emitter and a second side of the emitter. The echelon shaped teeth may run parallel to the first edge, and the second edge.
BRIEF DESCRIPTION OF THE DRAWINGS

[005] The detailed description is described with reference to the accompanying figures. In the figures, the left-most digit(s) of a reference number identifies the figure in which the reference number first appears. The same numbers are used throughout the drawings to refer like features and components.

[006] Figure 1 illustrates a perspective view of an emitter, in accordance with an embodiment of the present subject matter.

[007] Figure 2 illustrates a full length “6 inch deluxe TT 17 x 15 complete 3 up” flow model in accordance with an embodiment of the present subject matter.

[008] Figure 3 illustrates a front flow-path inlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[009] Figure 4 illustrates a front flow-path middle of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[010] Figure 5 illustrates a front flow-path outlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[011] Figure 6 illustrates a middle flow-path inlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[012] Figure 7 illustrates a middle flow-path middle of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[013] Figure 8 illustrates a middle flow-path outlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.
Figure 9 illustrates a back flow-path inlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

Figure 10 illustrates a back flow-path middle of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

Figure 11 illustrates a back flow-path outlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

Figure 12 illustrates a full length “8 inch deluxe TT 17 x 15” flow model, in accordance with an embodiment of the present subject matter.

Figure 13 illustrates a flow-path inlet of the “8 inch deluxe TT 17 x 15” flow model, in accordance with an embodiment of the present subject matter.

Figure 14 illustrates a flow-path middle of the “8 inch deluxe TT 17 x 15” flow model, in accordance with an embodiment of the present subject matter.

Figure 15 illustrates a flow-path outlet of the “8 inch deluxe TT 17 x 15” flow model, in accordance with an embodiment of the present subject matter.

**Detailed Description**

The present subject matter discloses an emitter configured to allow for low flow rate of water in a drip irrigation system.

In the proposed invention, the echelon shaped teeth allows the emitter to better disrupt the flow of fluid, thus creating more vectors in the flow-path which results in a lower flow when compared to the same emitter using the typical straight tooth design.

In addition to lower flow, the echelon shaped teeth enables opening up the flow path by raising the ceiling and creating more distance between teeth.
This provides the advantages of reducing the flow rate and a lesser chance of clogging due to the increased cross-sectional area of the flow path.

[0024] Referring to Figure 1, a perspective view of an emitter 100, in accordance with an embodiment of the present subject matter. The emitter 100 may comprise of a plurality of holes 106, running along a first edge 102 and a second edge 104 of the emitter. The plurality of holes 106 may act has additional filter for filtration of slits and/or impurities. Further, the plurality of holes 106 may run along periphery of the emitter 100. The plurality of holes may extend on entire length of the emitter 100 or at least partial length of the emitter 100, between a first side 110 and a second side 112. The emitter 100 may further comprise of an echelon shaped teeth portion 114. The echelon shaped teeth portion may run parallel to the first edge 102 and the second edge 104. Further the echelon shaped teeth portion 114 at least partially extends between the first side 110 and the second side 112. According to an exemplary embodiment creating more distance between two consecutive teeth’s i.e. a gap between two consecutive teeth of the echelon teeth shaped portion may be substantial to provide increased cross-section.

[0025] Figure 2 and figure 12 shows the two embodiments “6 inch deluxe TT 17 x 15 complete 3 up” and “8 inch TT Deluxe 17x15” flow model, which have their own flow rates. The two embodiments can be implemented in different situations based on the flow-rate required.

[0026] Figure 3 illustrates a front flow-path inlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter. The flow-rate per device in front flow-path is 0.348357LPH (Liters per hour) or 0.092026178GPH (Gallons per hour) or 0.00153377GPM (Gallons per minute) or 0.230065446GPM per 100 feet.

[0027] Now referring to Figure 4 illustrates a front flow-path middle of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter. The flow-rate per device in middle flow-path is 0.347652LPH (Liters per hour) or 0.091839937GPH (Gallons per
hour) or 0.001530666GPM (Gallons per minute) or 0.229599843GPM per 100 feet.

[0028] Figure 5 illustrates a front flow-path outlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[0029] Figure 6 illustrates a middle flow-path inlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter. According to the exemplary embodiment flow can still occur even through a multitude of inlet clog.

[0030] Figure 7 illustrates a middle flow-path middle of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[0031] Figure 8 illustrates a middle flow-path outlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[0032] Figure 9 illustrates a back flow-path inlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter. The flow-rate per device in back flow-path is 0.348174LPH (Litters per hour) or 0.091977835GPH (Gallons per hour) or 0.001532964GPM (Gallons per minute) or 0.229944587GPM per 100 feet.

[0033] Figure 10 illustrates a back flow-path middle of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[0034] Figure 11 illustrates a back flow-path outlet of the “6 inch deluxe TT 17 x 15 complete 3 up” flow model, in accordance with an embodiment of the present subject matter.

[0035] Figure 13 illustrates a flow-path inlet of the “8 inch deluxe TT 17 x 15” flow model, in accordance with an embodiment of the present subject matter. In the “8 inch TT Deluxe 17x15” flow model, the flow-rate per device is
0.2527LPH (Liters per hour) or 0.066756274GPH (Gallons per hour) or 0.001112605GPM (Gallons per minute) or 0.166890685GPM per 100 feet.

[0036] Figure 14 illustrates a flow-path middle of the “8 inch deluxe TT 17 x 15” flow model, in accordance with an embodiment of the present subject matter.

[0037] Figure 15 illustrates a flow-path outlet of the “8 inch deluxe TT 17 x 15” flow model, in accordance with an embodiment of the present subject matter.
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1. An emitter 100, comprising:
   a plurality of holes 106, running along a first edge 102 and a second edge 104 of the emitter 100; and
   an echelon shaped teeth portion, running parallel to the first edge and the second edge, wherein the echelon shaped teeth portion at least partially extends between a first side and a second side.

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3. The emitter of claim 1, wherein the emitter comprises a front flow-path, having a discharge rate of 0.348357 Liters per hour.

4. The emitter of claim 1, wherein the emitter comprises a middle flow-path, having a discharge rate of 0.347652 Liters per hour.

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