Nov. 28, 1967 R. DETHMERS 3,355,070

FIELD APPLICATOR WITH METERING ORIFICE AND ADJUSTABLE DISTRIBUTING MEANS

Filed Oct. 19, 1965

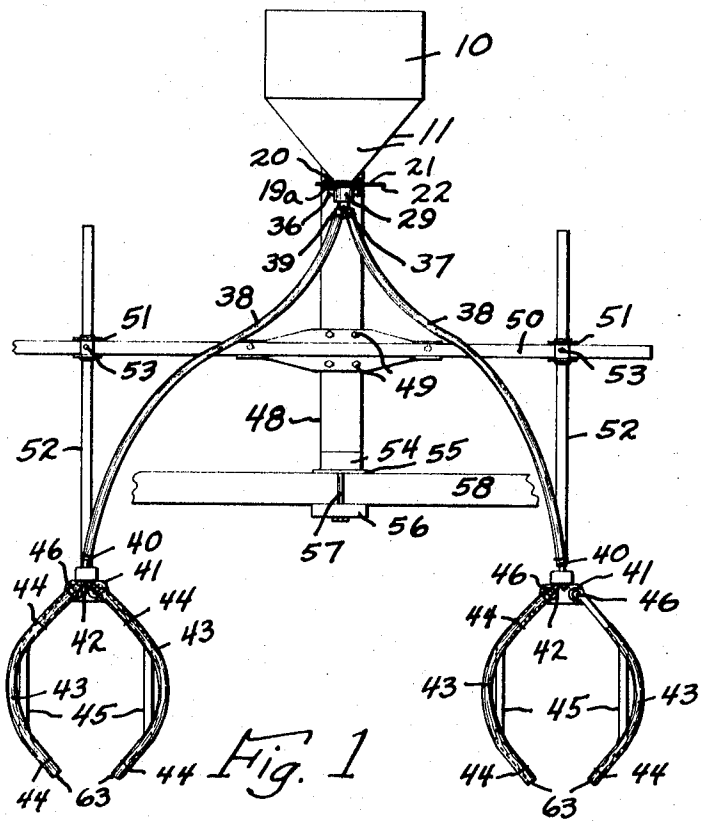


Fig. 1

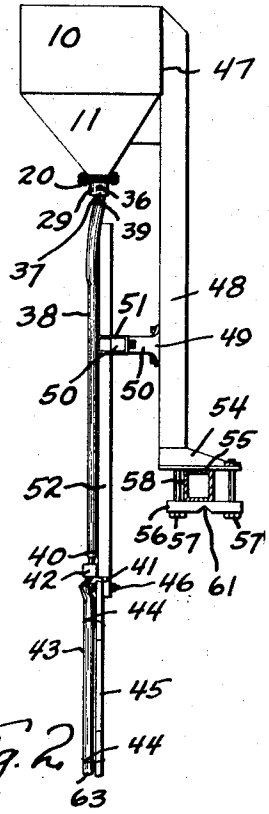


Fig. 2

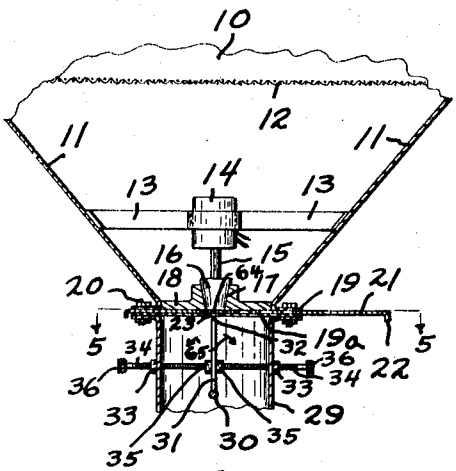


Fig. 3

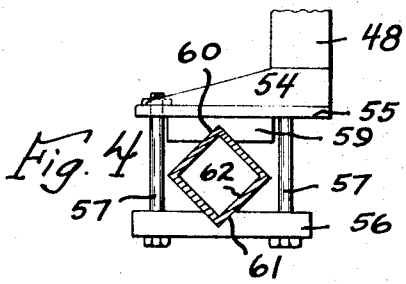


Fig. 4

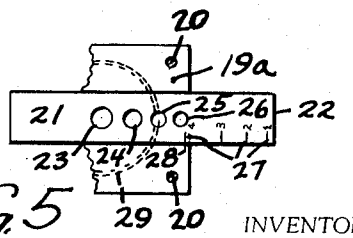


Fig. 5

INVENTOR.

Robert Dethmers

BY

Sam J. Slotky

ATTORNEY

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FIELD APPLICATOR WITH METERING ORIFICE AND ADJUSTABLE DISTRIBUTING MEANS

Robert Dethmers, Boyden, Iowa 51234

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ABSTRACT OF THE DISCLOSURE

A field applicator for application of insecticides or the like which is provided with a metering orifice and an adjustable device adapted to provide equal flow in the conduits thereof, and also having a solenoid operated shutoff valve.

My invention relates to a field applicator.

An object of my invention is to provide an applicator which will apply a material usually of powdered form, or the like to the field such as insecticides, for rootworm control, or any other types of material, such as organic phosphates, etc.

A further object of my invention is to provide an adjustable arrangement in which the applicator will include applicator heads which can be adjustably positioned vertically or laterally.

A further object of my invention is to provide an arrangement in which a positive acting valve will control the material passing to the heads.

A further object of my invention is to provide an arrangement in which the material can be selectively controlled as to its rate of discharge, and to also provide a further control for causing a uniform flow of material on both sides of the branch connections of the applicator heads.

A further object of my invention is to provide certain clamp arrangements whereby the unit can be attached to various types of supports.

With these and other objects in view, my invention consists in the construction, arrangement, and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

FIGURE 1 is a forward elevation of the unit as attached to a cultivator frame-work,

FIGURE 2 is a side view of FIGURE 1,

FIGURE 3 is an enlarged sectional detail,

FIGURE 4 is an enlarged detail of the clamp arrangement, and

FIGURE 5 is a sectional view of FIGURE 3 taken substantially along the lines 5—5 thereof.

My invention contemplates the provisions of an applicator for field purposes and which includes various features of adjustability, etc., for providing maximum efficiency in the operation thereof for the purpose intended.

In describing my invention I have used the character **10** to indicate a hopper having the downwardly convergent walls **11**, the character **12** indicating a screen for screening the applicator material so as to reduce it from lumps etc. into a more suitable form, the character **13** indicating brackets attached to the solenoid **14**, the solenoid being attached to the rod **15** which is attached to the tapered plunger **16** which fits within the tapered opening **17** in the plate **18**.

The character **19** indicates a flange suitably spaced from the plate **19***a*, the flange **19** and plate **19***a* being attached by the means of the bolts **20**, and the character **21** indicates a movable plate having the downwardly turned portion **22**, the plate **21** having the various different sized openings **23**, **24**, **25**, and **26** therein, the plate

21 also having the various marks **27** corresponding to these openings, the plate **19***a* having the mark **28** thereon.

Communicating with the plate **19***a* is the substantially round housing portion **29**.

The character **30** indicates a bar pivoted within the walls of the housing **29** and attached to the bar **30** is a vertically positioned plate **31**, the top **32** of which is adjacent to the center of the various openings **23**, **24**, **25**, and **26**, and attached to the housing **29** are the bosses **33** with which are threadably engaged the studs **34** which bear against the plate **31** at **35**, and attached to the studs **34** are the knurled heads **36**.

Communicating with the housing **29** as at **37** are the flexible tubes **38** suitably secured as at **39**, these tubes being connected at **40** to the members **41**, these tubes being suitably connected at **42** to the further flexible tubes **43** which are suitably attached at **44** to the framework members **45**, the members **45** being securely bolted as at **46** to the member **41**.

Attached to the hopper **10** at **47** (see FIGURE 2) is a vertically positioned channel member **48** to which is attached at **49** the transverse bracket **50** including the U shaped members **51** which can be shifted to any position laterally, and which are suitably secured, and passing through the members **51** are the vertically positioned rods **52** which are secured to the members **41**, the bolts **53** provided means for adjusting the rods **52** upwardly or downwardly, and attached to the bottom of the channel **48** is a member **54** having the plate **55** attached thereto, the character **56** indicating a further channel shaped plate, the plates **55** and **56** being secured by the means of the bolts **57** to the square-in-section cultivator bar **58**, this arrangement thereby serving to support the entire unit.

The character **59** indicates an insert channel (see FIGURE 4) having the V shaped cut-out portion **60**, and the plate **56** includes a V shaped portion **61** which can be reversed as shown in FIGURE 4, and which together with the plate **59** will then provide means for securing the unit to a cultivator frame-work bar **62** which is positioned at the angle shown, this clamping arrangement thereby serving to accommodate either type of framework.

The tubes **43** are preferably made of a resilient and transparent plastic material so that the rate of flow of the granular material through the same can be observed. By unbolting the bolts at **46**, the frameworks **45** can be pivoted to any desired position laterally to provide for a wider separation between the lower open ends **63** of the tubes **43** so that earth rows of various widths can be accommodated. Also, as explained above, the bars **52** can be spread apart to desired distances, and these bars can be raised or lowered to vary the vertical height of the distributing tubes **43**.

The solenoid **14** is suitably actuated to raise the plunger **16** to allow the material to flow downwardly into the distributing members, and also either of the openings **23**, **24**, **25**, or **26** can be placed centrally beneath the central opening **64** in the plate **19***a* by merely placing either of the marks **27** at the mark **28**, these various sized openings governing the rate of flow.

By rotating the knurled heads **36**, the plate **31** can be pivoted in either direction **65** to also regulate the flow of material downwardly through the various tubes **38** and **43**, the studs **34** being adjustably positioned to cause the plate **31** to pivot in either direction to adjust the delivery rate of the tubes **43** which may vary due to mechanical or other reasons, the plate **31** thus being adjusted so that the rate of flow through the tubes **43** is the same on both sides, which rate of flow can be observed by causing the flow through the openings **63** to pass into suitable containers having identical measuring arrangements and in this way the rate of flow will be suitably regulated.

It will thus be noted that the device of my invention will provide means for the application of the granular material to the field for the various purposes intended, that the arrangement is adjustable as to spacing as well as to flow, it being also noted that further advantages will be apparent.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. A field applicator comprising a framework, a hopper attached to said framework, a pair of tubes communicating to said hopper, a pair of distributing units communicating with said tubes, each of said distributing units including frame members, further tubes attached to said frame members, brackets to which said frame members are adjustably secured, means for positioning said distributing units at pre-selected lateral and vertical distances, including vertically positioned rods attached to said brackets, means for positioning said rods vertically and laterally with respect to said framework, a housing communicating with said hopper, said housing including a valve opening, a plate slidably engaged with said housing, said plate having a plurality of different sized openings, means for positioning any of said openings to communicate with said valve opening.

2. The device of claim 1 in which a solenoid is mounted within said hopper, valve means operably connected to said solenoid adapted to close said valve opening to provide a shutoff means, said solenoid being operable from a point externally of said hopper.

3. A field applicator comprising a framework, a hopper attached to said framework, a pair of tubes communicating to said hopper, a pair of distributing units communicating with said tubes, each of said distributing units including frame members, further tubes attached to said frame members, brackets to which said frame members are adjustably secured, means for positioning said distributing units at pre-selected lateral and vertical distances, including vertically positioned rods attached to said brackets, means for positioning said rods vertically and laterally with respect to said framework, a housing communicating with said hopper, said housing including a valve opening, a plate slidably engaged with said housing, said plate having a plurality of different sized openings, means for positioning any of said openings to communicate with said valve opening, said housing including a vertically positioned baffle plate pivotally mounted

therein, means for pivoting said baffle plate beneath said openings to adjust the flow of material to said further tubes.

4. A field applicator comprising a framework, a hopper attached to said framework, a pair of tubes communicating to said hopper, a pair of distributing units communicating with said tubes, each of said distributing units including frame members, further tubes attached to said frame members, brackets to which said frame members are adjustably secured, means for positioning said distributing units at pre-selected lateral and vertical distances, including vertically positioned rods attached to said brackets, means for positioning said rods vertically and laterally with respect to said framework, a housing communicating with said hopper, said housing including a valve opening, a plate slidably engaged with said housing, said plate having a plurality of different sized openings, means for positioning any of said openings to communicate with said valve opening, said housing including a vertically positioned baffle plate pivotally mounted therein, means for pivoting said baffle plate beneath said openings to adjust the flow of material to said further tubes, means for attaching said framework to a square-in-section further framework portion, including an upper plate attached to said framework, a lower plate attached to said framework, an insert channel member having an inverted V-shape cut-out portion, said lower plate having a V-shape cut-out portion, said cut-out portions being adapted to receive the upper and lower edges of a square-in-section further framework portion when the sides of said further framework portion are positioned at an angle to the horizontal, inversion of said lower plate permitting reception of a square-in-section further framework portion between the same and said upper plate when said sides are horizontal.

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ROBERT B. REEVES, *Primary Examiner.*

KENNETH N. LEIMER, *Examiner.*