Oct. 8, 1963 S. A. HAYES 3,106,347

ADJUSTABLE DEFLECTOR FOR A SPRAY NOZZLE

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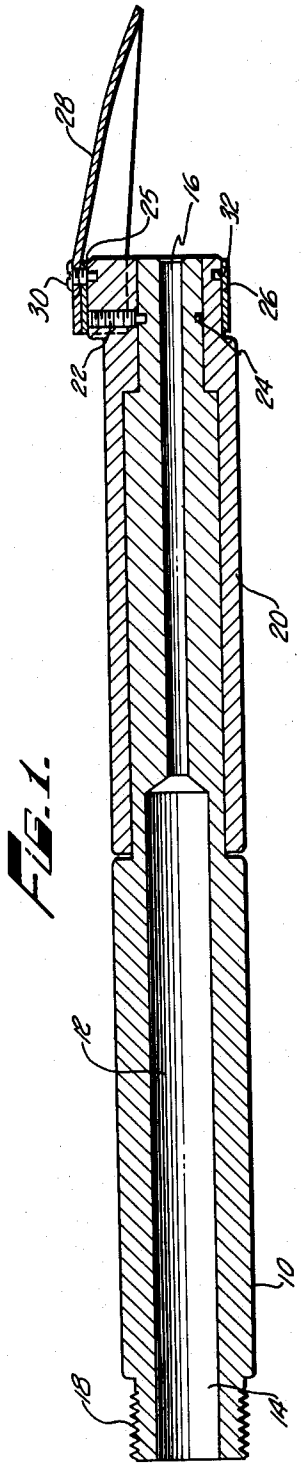


FIG. 1.

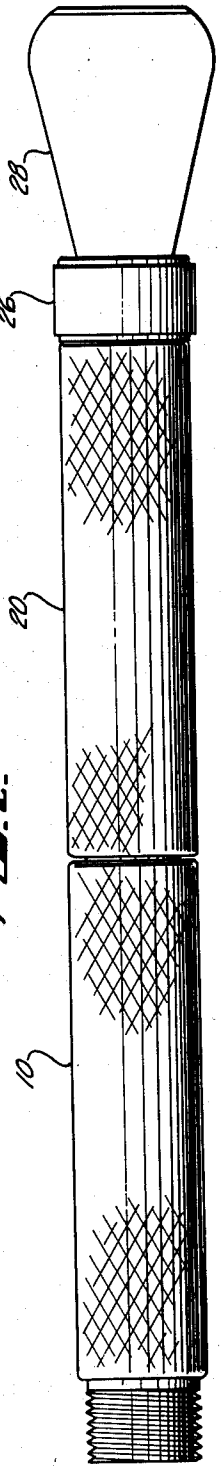


FIG. 2.

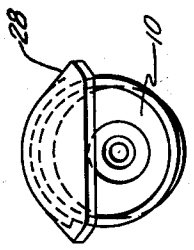


FIG. 3.

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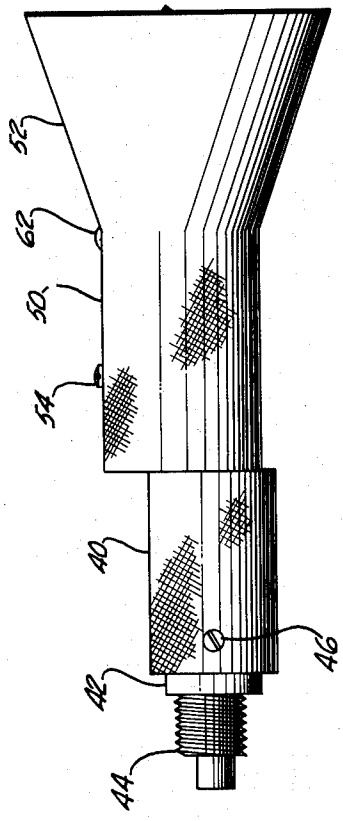


FIG. 4.

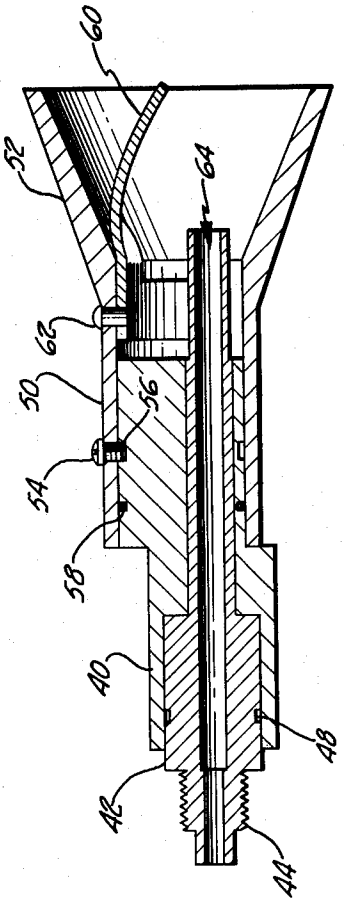


FIG. 5.

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ADJUSTABLE DEFLECTOR FOR A SPRAY NOZZLE

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7 Claims. (Cl. 239—505)

The present invention relates to spraying nozzles and more particularly to an apparatus for controlling the type of spray issuing from such nozzles.

Spraying devices are well known in which a deflector is arranged to project into the discharge stream from the nozzle for providing a preselected spray pattern. Such conventional spraying devices have several disadvantages. First, the discharge stream may be deflected into only one spray pattern if the deflector is used. Second, if a solid discharge stream is desired, the deflector must be removed from the discharge nozzle and hence may be easily lost.

A spraying device capable of providing several different spray patterns is needed when many different types of plants, shrubs, trees, etc. are to be sprayed with different chemicals, for example, in the control of garden insects and diseases.

In accordance with the present invention, an adjustable deflector spraying device is provided for a discharge nozzle in which a deflector is provided for deflecting the discharge stream in the form of a spray and means are connected between the deflector and the discharge nozzle for eccentrically and rotatably mounting the deflector on the discharge nozzle relative to the discharge stream whereby the type of spray pattern may be readily controlled by rotating the deflector. In the apparatus of this invention, an infinite number of stream patterns may be obtained.

The invention is described in more detail in reference to the accompanying drawing in which:

FIG. 1 is a cross sectional view of an apparatus in accordance with the present invention;

FIG. 2 is a plan view of the apparatus of FIG. 1;

FIG. 3 is an end view of the apparatus of FIG. 1;

FIG. 4 is a plan view of another embodiment of the present invention; and

FIG. 5 is a cross sectional view of the apparatus of FIG. 4.

Referring now to the drawing and more particularly to FIG. 1, there is illustrated a discharge nozzle in the form of a housing **10**. The housing **10** defines a liquid passageway **12** therethrough between an inlet port **14** and an outlet or discharge port **16**. The housing **10** may be connected to a suitable source of liquid under pressure such as a conventional garden hose by means of the external threads **18**. A deflector holder **20** is rotatably mounted on the housing adjacent the outlet end as shown. A guide pin **22** is secured at one end to the deflector holder **20** and at the other end projects into an annular guide groove **24** in the housing **10** adjacent the outlet end **16**. The guide pin **22** and the cooperating guide groove **24** permit the deflector holder **20** to rotate relative to the housing **10** while preventing longitudinal movement between the housing **10** and the holder **20**.

The deflector holder **20** is provided with an annular bearing surface **25** which is eccentric to the discharge stream or the longitudinal axis *x—x* of the discharge nozzle. A deflector ring **26** is rotatably mounted on the annular bearing **25**. A curved deflector blade **28** is suitably secured to the deflector ring **26** by brazing, welding, etc. for deflecting the discharge stream in the form of a spray as will be more fully described. A guide pin **30** is secured at one end to the deflector **28** and the deflector ring **26** and projects inwardly therefrom to engage

an annular guide groove **32** in the surface **25** of the deflector holder **20** to prevent longitudinal movement between the deflector ring **26** and the deflector holder **20**.

The housing **10**, the deflector holder **20** and the deflector ring **26** may have an externally knurled portion **36**, **37** and **38**, respectively, to aid the operator in rotating the several parts.

In operation the deflector ring **26** and the deflector **28** are rotated relative to the deflector holder **20** to control the degree of stream interception by the deflector and thereby the spray pattern issuing from the discharge nozzle. In the position of the deflector **28** as shown in FIGS. 1 and 3 the deflector **28** does not intercept the discharge stream which results in a solid stream issuing from the nozzle. When the deflector **28** is rotated 180° it is positioned for the maximum discharge stream interception. By rotating the deflector **28** relative to the deflector **20** an infinite number of spray patterns may be obtained.

To control the angle of the spray pattern issuing from the deflector relative to a horizontal plane, the deflector holder **20** is rotated relative to the housing **10**.

Referring now to FIGS. 4 and 5 there is illustrated a modification of the apparatus of FIG. 1 in which a deflector holder **40** is rotatably mounted on a housing **42**. The housing **42** includes an externally threaded portion **44** for connection to a hose or the like. A guide screw **46** is secured to the housing **40** and extends inwardly therefrom to engage a guide groove **48** in the housing **42** to prevent longitudinal movement between the deflector holder **40** and the housing **42** while permitting rotary motion therebetween. A deflector ring **50** including a bell shaped or frusto-conical end portion **52** is rotatably mounted on the deflector holder **40** by means of a guide screw **54** which cooperates with an external guide groove **56** on the deflector holder **40** as shown. An O-ring **58** is also disposed in an external groove in the deflector holder **40** to provide a frictional force between the deflector holder **40** and the deflector ring **50** which resists relative rotation between the members. The frictional force provided by the O-ring **58** prevents the deflector ring **50** from rotating relative to the deflector holder **40** once it has been rotated to a desired position by the operator. A deflector **60** is connected to the deflector ring **40** by means of a rivet **62** and is disposed within the bell shaped end portion **52** of the deflector ring **50**. As is shown, the deflector ring **50** is eccentrically mounted on the deflector holder **40** so that when the deflector ring **50** is rotated relative to the deflector holder **40** the deflector **60** intercepts various portions of the stream issuing from the discharge port or outlet **64** of the housing **42**. In the position shown in FIG. 5, the deflector **60** is positioned out of the path of the discharge stream. The deflector ring **50** with the bell shaped end portion **52** which shields the deflector **60** prevents damage to the deflector **60** when the nozzle is dropped or dragged over the surface of the ground.

I claim:

1. An adjustable nozzle comprising a housing defining a liquid passageway therethrough between an inlet and an outlet, a deflector holder rotatably mounted on the housing concentrically with respect to the liquid passageway and adjacent the outlet end thereof, the deflector holder defining an annular bearing surface eccentrically arranged with respect to the discharge stream, a deflector ring engaging the annular bearing surface on the deflector holder and a deflector blade secured to the deflector ring whereby the degree of interception by the deflector blade may be adjusted by rotating the deflector ring relative to the deflector holder and the angle of the stream issuing from the deflector blade may be adjusted by rotating the deflector holder relative to the discharge nozzle and means coupled between the deflector holder and the housing to

prevent substantial longitudinal movement between the housing and the deflector holder.

2. The combination as defined in claim 1 including means disposed between the deflector holder and the housing to provide a frictional force tending to resist relative movement between the deflector holder and the discharge nozzle.

3. The combination as defined in claim 1 wherein the housing defines an annular guide groove adjacent the outlet end thereof and including a guide pin secured at one end to the deflector holder and having another end in engagement with the annular groove in the housing to prevent longitudinal movement between the housing and the deflector holder.

4. The combination as defined in claim 3 wherein the deflector holder defines an annular groove within the bearing surface and including a guide pin secured at one end to the deflector ring and engaging the annular groove in the deflector holder at the other end for preventing longitudinal movement between the deflector ring and the deflector holder.

5. The combination as defined in claim 4 including an O-ring disposed between the deflector holder and the deflector ring for resisting relative rotation therebetween.

6. The combination as defined in claim 4 wherein the deflector ring includes a bell shaped guard member extending around the deflector blade and the outlet of the housing.

7. An adjustable nozzle for discharging a stream having a controlled spray pattern when connected to a source of liquid under pressure comprising a housing defining

a liquid passageway therethrough between an inlet and an outlet so that the discharge stream issues from the outlet, a deflector holder rotatably mounted on the housing concentrically with respect to the liquid passageway, the deflector holder defining an annular bearing surface eccentrically arranged with respect to the discharge stream, a deflector ring engaging the annular surface of the deflector holder and having an outwardly projecting bell shaped guard portion extending beyond the end of the outlet of the housing, a curved deflector blade secured to the deflector ring and disposed within the bell shaped guard portion of the deflector ring, whereby the degree of interception of the discharge stream by the deflector blade may be adjusted by rotating the deflector ring relative to the deflector holder and the angle of the stream issuing from the deflector blade may be adjusted by rotating the deflector holder relative to the housing.

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