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(54) **DEFLECTOR FOR A SPRINKLER**

DEFLEKTOR FÜR EINEN SPRINKLER

DÉFLECTEUR POUR UN EXTINCTEUR AUTOMATIQUE À EAU

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**Description**TECHNICAL FIELD

**[0001]** The present invention relates to a sprinkler. In particular, the present invention relates to a deflector for a sprinkler.

BACKGROUND

**[0002]** Sprinklers, used for watering gardens or agricultural irrigation, are well known in the art.

**[0003]** Typically, a sprinkler includes a sprinkler head having one or more nozzles for discharging one or more water jets to the surrounding area. A nozzle is adapted to discharge the water jet at a given range. In various applications, the range of the water jet requires to be varied to water areas located at different distances from the sprinkler.

**[0004]** Typically, the range of the water jet can be changed by using a deflector located downstream of nozzle. The deflector is movable between an idle position and an actuating position by an actuator and includes a deflecting surface which is in contact with the water jet in the adjusting position. When the water jet from the nozzle impinges on the deflecting surface, a significant amount of water may get splashed. The splashed water does not travel any further from the deflecting surface, and flows down through various components of the sprinkler. Subsequently, the splashed water accumulates around the sprinkler, and may have a detrimental effect on the vegetation and the soil. The splashed water may also damage various components of the sprinkler while flowing down.

**[0005]** Patent publications EP 1 967 279 A1 and DE 10 2008 063584 A1 disclose deflecting surfaces to change the range of a water jet. However, the deflecting surfaces may result in a significant amount of splashed water during operation, the splashed water resulting in the aforementioned problems.

**[0006]** In light of the foregoing, there is a need for a deflector which at least partly reduces splashed water.

SUMMARY

**[0007]** In view of the above, it is an objective of the present invention to solve or at least reduce the problems discussed above. In particular, the objective is to provide a deflector for a sprinkler that at least partly reduces splashed liquid.

**[0008]** The objective is at least partially achieved according to a novel sprinkler having a sprinkler head described in claim 1. The sprinkler head includes at least one nozzle provided in the sprinkler head. The nozzle includes a nozzle body and a nozzle opening. Further, the nozzle is configured to discharge a liquid jet through the nozzle opening. A deflector is provided downstream of the nozzle, the deflector including a deflecting surface

which is in contact with the liquid jet to adjust a range of the liquid jet. The deflector further includes an elongated guiding element that is located upstream of the deflecting surface. The guiding element is in contact with the liquid jet to direct splashed liquid from the deflecting surface back into the liquid jet. Thus, the guiding element reduces wastage of the liquid and improves the output of the sprinkler. The guiding element also substantially prevents flow of the splashed liquid down the sprinkler head. Thus, accumulation of the splashed liquid around the sprinkler is substantially reduced. Further, various components of the sprinkler may be safeguarded against contact with the splashed liquid.

**[0009]** According to the invention, the guiding element extends at an angle with respect to a direction of discharge of the liquid jet.

**[0010]** According to claim 4, the guiding element is substantially needle shaped. Such a shape of the guiding element may facilitate in directing the splashed liquid towards the liquid jet.

**[0011]** According to the invention, the deflector is mounted on the sprinkler head within a holding structure. Further, according to the invention, the guiding element is in intimate contact with the nozzle body and/or a wall element of the holding structure adjacent to the nozzle body. Thus, there exists almost no clearance between the nozzle body and the guiding element. This substantially prevents an entry of any liquid which is deflected from the guiding element after exiting the nozzle opening. Moreover, according to claim 2, the guiding element is resiliently biased against the nozzle body and/or the wall element of the holding structure adjacent to the nozzle body. Alternatively, according to claim 3, the whole deflector is resiliently biased against the nozzle body and/or the wall element of the holding structure adjacent to the nozzle body.

**[0012]** According to claim 5, the deflecting surface is substantially roof shaped. Such a shape facilitates deflection of the liquid jet when the liquid jet impinges on the deflecting surface.

**[0013]** According to claim 6, the deflector also includes a baffle surface adapted to increase a spread of the liquid jet in the adjusting position of the deflector. Additionally, according to claim 7, the deflector also includes at least two directing surfaces adapted to limit the spread of the liquid jet, each directing surface being positioned at each lateral side of the baffle surface.

**[0014]** According to claim 8, the deflector further includes connecting portions adapted to attach the deflector to the sprinkler head.

**[0015]** According to claim 9, the deflector is movable with respect to the nozzle between at least an adjusting position and an idle position. The guiding element is in contact with the liquid jet in the adjusting position, whereas the guiding element is not in contact with the liquid jet in the idle position. Moreover the deflector is adapted to reduce the range of the liquid jet in the adjusting position. Additionally, according to claim 10, wherein the deflector

is adapted to move in a direction which is oriented at an angle with respect to the direction of discharge of the liquid jet.

**[0016]** According to claim 9, an actuator is provided to move the deflector between the idle position and the adjusting position. Further, according to claim 11, the actuator includes a rotatable threaded element.

**[0017]** According to the invention, the angle between the guiding element and the direction of discharge of the liquid jet lies in a range from about 45 degrees to 90 degrees. This is also the angle between the direction of movement of the deflector and the direction of discharge of the liquid jet.

**[0018]** According to claim 12, the sprinkler is a pop-up sprinkler and the sprinkler head is movable between an operating position and a retracted position. Further, according to claim 13, the sprinkler head is rotatable about a rotational axis.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0019]** The invention will in the following be described in more detail with reference to the enclosed drawings, wherein:

FIG. **1A** illustrates a perspective view of a sprinkler with portions cut away from a cover element and a deflector in an idle position, according to an embodiment of the present invention;

FIG. **1B** illustrates a perspective view of the sprinkler with portions cut away from the cover element and the deflector in an adjusting position, according to an embodiment of the present invention;

FIG. **2A** illustrates a sectional view of the sprinkler with the deflector in the idle position, according to an embodiment of the present invention;

FIG. **2B** illustrates a sectional view of the sprinkler with the deflector in the adjusting position, according to an embodiment of the present invention;

FIG. **3A** illustrates a rear perspective view of the deflector, according to an embodiment of the present invention; and

FIG. **3B** illustrates a front perspective view of the deflector, according to an embodiment of the present invention

#### DESCRIPTION OF EMBODIMENTS

**[0020]** The present invention will be described more fully hereinafter with reference to the accompanying drawings, in which example embodiments of the invention incorporating one or more aspects of the present invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

For example, one or more aspects of the present invention can be utilized in other embodiments and even other types of devices. In the drawings, like numbers refer to like elements.

**[0021]** FIGS. **1A** and **1B** illustrate perspective views of a sprinkler head **100** with portions cut away from a cover element **102**, according to an embodiment of the present invention. The sprinkler head **100** is a part of a sprinkler which may be used in various applications, such as, watering gardens, agricultural irrigation, or the like. Though the sprinkler normally dispenses water, the sprinkler may be utilized to dispense any type of liquid within the scope of the present invention.

**[0022]** In an embodiment of the present invention, the sprinkler may be a pop-up sprinkler such that the sprinkler head **100** is movable between an operating position, as illustrated in FIGS. **1A** and **1B**, and a retracted position. In the retracted position, the sprinkler head **100** may be partly enclosed in a ground sleeve (not illustrated in the figures) which is embedded in the ground. The sprinkler may include one or more elastic elements (E.g., springs) to normally bias the sprinkler head **100** in the retracted position. The sprinkler head **100** is displaced from the retracted position to the operating position when a liquid is supplied from an external source to the sprinkler. Thus, when liquid supply from the external source is ceased, the sprinkler head **100** moves back to the retracted position. In an alternative embodiment of the present invention, the sprinkler may be any other type of sprinkler such that the sprinkler head **100** is always in the operating position above the ground.

**[0023]** Further, in an embodiment of the present invention, the sprinkler head **100** is configured to rotate about a rotational axis **R** in the operating position. The sprinkler head **100** may rotate due to impact forces from the liquid or due to separate motive means, such as, an electric motor. The sprinkler head **100** may also be configured to rotate in one or more circular sectors, and/or a full circle. However, in an alternative embodiment of the present invention, the sprinkler head **100** may be stationary.

**[0024]** As illustrated in FIGS. **1A** and **1B**, the sprinkler head **100** includes the cover element **102**, a base element **104**, and a nozzle **106**. The sprinkler head may also include a cap element (not illustrated in the figures) to cover the top portion of the sprinkler head **100**. The nozzle **106** includes a nozzle body **108** and a nozzle opening **110**, and is configured to discharge a liquid jet (illustrated in FIGS. **2A** and **2B**) through the nozzle opening **110**. The nozzle **106** may be in fluid communication with the external liquid supply via a channel (not illustrated in the figures) extending through the sprinkler head **100**. The nozzle **106** may be rotationally adjustable about one or more axes. The nozzle **106** may also be replaceable by another nozzle with a different construction. Further, the sprinkler head **100** may also include multiple nozzles which may be identical to the nozzle **106** or different from the nozzle **106**.

**[0025]** Further, a deflector **112** is provided downstream of the nozzle **106**. The deflector **112** includes a deflecting surface **114** to adjust a range of the liquid jet, and a deflector opening **115** for discharge of the liquid jet. As illustrated in FIGS. **1A** and **1B**, the deflecting surface **114** is substantially roof shaped. Such a shape facilitates deflection of the liquid jet when the liquid jet impinges on the deflecting surface **114**. However, the deflecting surface **114** may have any shape within the scope of the present invention. The cover element **102** includes an opening **116** (partially illustrated in FIGS. **1A** and **1B**) which substantially conforms to the deflector opening **115** for discharge of the liquid jet to the surrounding area. Further, the deflector **112** is movable between at least an idle position (as illustrated in FIG. **1A**) and an adjusting position (as illustrated in FIG. **1B**). An actuator **118** is provided to move the deflector **112** between the idle position and the adjusting position. The deflector **112** also includes an elongated guiding element **120** (hereinafter referred to as "the guiding element **120**") that is in contact with the liquid jet in the adjusting position. The guiding element **120** is provided upstream of the deflecting surface **114**. Additionally, the deflector **112** includes a baffle surface **122** and at least two directing surfaces **124**. The various parts of the deflector **112** including the guiding element **120**, the baffle surface **122** and the directing surfaces **124** are described in detail with reference to the subsequent figures.

**[0026]** Further, the deflector **112** is mounted on the sprinkler head **100** within a holding structure **126** which is partially illustrated in FIGS. **1A** and **1B**. The holding structure **126** includes wall elements **128** and **130** that are located adjacent to the nozzle **106**. The deflector **112** is further enclosed on a lower side by another wall element **132**. The cover element **102** partially covers the deflector **112** on the front. In FIGS. **1A** and **1B**, a wall element similar to the wall element **130** is hidden by the cover element **102**. The deflector includes multiple connecting parts (described with reference to FIGS. **3A** and **3B**) to attach the deflector **112** to the holding structure **126** such that the deflector **112** can move from the idle position to the adjusting position. The holding structure **126** for the deflector **112** is only exemplary in nature, and the deflector **112** may be mounted on the sprinkler head **100** using any method or system. Further, the deflector **112** may also be stationary and mounted fixedly in the adjusting position within the scope of the present invention. In such case, the deflector **112** may be attached to the sprinkler head **100** by various methods, such as, adhesives, mechanical fasteners, or the like. Alternatively, the deflector **112** may also be an integral component of the sprinkler head **100**.

**[0027]** FIGS. **2A** and **2B** illustrate sectional views of the sprinkler head **100** in the idle position and the adjusting position of the deflector **112**, respectively, according to an embodiment of the present invention. In FIG. **2A**, the liquid jet **202** is discharged at a range in a direction **D1** through the nozzle opening **110** and the opening **116**

in the cover element **102**. The deflector **112** is in the idle position and is not in contact with the liquid jet. In FIG. **2B**, the deflector **112** is lowered to the adjusting position such that the various components of the deflector **112**, including the deflecting surface **114**, the guiding element **120**, the baffle surface **122**, and the directing surfaces **124** are in contact with the water jet. A direction of the liquid jet **202**, downstream of the nozzle opening **110**, is changed from **D1** to **D2** after contact with various components of the deflector **112**. Consequently, the range of the liquid jet is reduced, and the liquid reaches parts of the surrounding area closer to the sprinkler. It may be apparent to a person ordinarily skilled in the art that the directions **D1** and **D2** are for exemplary purposes only, and the direction **D2** may change with different adjusting positions of the deflector **112**.

**[0028]** When the liquid jet from the nozzle opening **110** impinges on the deflecting surface **114**, splashed liquid is generated. However, the guiding element **120**, which is located upstream of the deflecting surface **114**, directs at least a part of the splashed liquid back into the liquid jet **202**. Thus, at least a part of the splashed liquid reaches the surrounding area. Further, the guiding element **120** extends substantially at an angle  $\theta$  with respect to the direction of discharge **D1** of the liquid jet **202**. The angle  $\theta$  may lie in a range from about 45 degrees to 90 degrees. In an embodiment of the present invention, the angle  $\theta$  is of a value such that the guiding element **120** extends substantially perpendicular to the direction **D2** in the adjusting position. Thus, the guiding element **120** reduces wastage of the liquid and improves the output of the sprinkler. The guiding element **120** also substantially prevents flow of the splashed liquid down the sprinkler head **100**. Thus, accumulation of the splashed liquid around the sprinkler is substantially reduced. Further, various components of the sprinkler may be safeguarded against a contact with the splashed liquid. As illustrated in FIGS. **1A-2B**, the guiding element **120** is substantially needle shaped. Such a shape of the guiding element **120** may facilitate in directing the splashed liquid towards the liquid jet **202**. However, the guiding element **120** may be of any other shape (E.g., rectangular) within the scope of the present invention.

**[0029]** Further, a front surface **204** of the guiding element **120** is exposed to the splashed liquid from the deflecting surface **114**. Thus, the front surface **204** primarily directs the splashed liquid towards the liquid jet **202**, whereas a rear surface **206** of the guiding element **120** is exposed to the liquid jet discharged from the nozzle opening **110**. Therefore, the rear surface **206**, in addition to the needle shape of the guiding element **120**, may deflect a part of the liquid jet back towards the nozzle **106** before the liquid jet **202** reaches the deflecting surface **114**. This liquid may enter a space between the deflector **112** and the nozzle **106**, and spatter out of the sprinkler head **100**. To substantially prevent this, the guiding element **120** is in intimate contact with the nozzle body **108** and the wall element **128** in the adjusting po-

sition of the deflector **112**, such that there exists almost no clearance between the nozzle body **108** and the guiding element **120**. Further, the guiding element **120** is in intimate contact with the wall element **128** only in the idle position of the deflector **112**. In an embodiment of the present invention, the guiding element **120** is resiliently biased against the nozzle body **108** and the wall element **128**. The guiding element **120** may be elastic in nature or may be biased by external means (E.g., springs). In another embodiment of the present invention, the deflector **112** as a whole is resiliently biased against the nozzle body **108** and the wall element **128**. In such a case, the deflector **112** may be biased by one or more resilient members, such as, springs.

**[0030]** As illustrated in FIGS. **2A** and **2B**, the deflector **112** moves at the angle  $\theta$  with respect to the direction **D1** between the adjusting position and the idle position. Particularly, the deflector **112** moves in a direction which is substantially parallel to the direction at which the guiding element **120** extends. Further, the deflector **112** may move due to the actuation of the actuator **118**. The actuator **118** includes a rotatable threaded element **208**, such as a screw, which can be manually actuated by means of a tool (E.g., a screwdriver). The threaded element **208** extends into an upper part **210** of the deflector **112** such that on rotating the threaded element **208**, the deflector **112** moves up or down depending on the direction of rotation. The upper part **210** may include internal threads that engage with the threads of the threaded element **208**. Moreover, a lower part **212** may be substantially L-shaped to limit the downward movement of the deflector **112** to the adjusting position. Specifically, the lower part may engage with the wall element **132** at the adjusting position. The actuator **118** is purely exemplary in nature and any type of actuation means can be envisioned without departing from the scope of the present invention. For example, another threaded element may be attached to the lower part of the deflector **112**. Alternatively, only one threaded element may be attached to the lower part **212** of the deflector **112**. Further, the actuator **112** may be actuated by an electric motor instead of being manually actuated. The deflector **112** can further be improved by safeguarding it from damages. This can be achieved by slitting the upper part **210** along its longitudinal axis into 2 or more subsections. Thus if the deflector **112** sits in on of its upper or lower end position and the threaded element **208** will still be rotated by a user these subsections will be bend outwards as seen from the longitudinal axis of the upper part **210** and thus the upper part will be safeguarded from breaking.

**[0031]** FIGS. **3A** and **3B** illustrate perspective views of the deflector **112**, according to an embodiment of the present invention. The guiding element **120** extends from a substantially rectangular portion **302** which is attached to the upper part **210** of the deflector **112**. The guiding element **120** is also positioned substantially symmetrically with respect to the deflecting surface **114**. This maximizes the contact of the guiding element with the

splashed liquid from the deflecting surface **114**. Further, the deflector **112** includes connecting portions **304** that engage with the wall elements **130** for attaching the deflector **112** to the sprinkler head **100** in a movable fashion.

Moreover, the deflector includes an upper frame **306**, lateral frames **308** and a lower frame **310** which form the deflector opening **115**. The upper frame **306** is substantially roof shaped to form the deflecting surface **114**. The lower frame **310** with a projection **312** forms the L-shaped lower part **212** for limiting the downward movement of the deflector **112**.

**[0032]** According to the FIGS. **3A** and **3B**, the deflector **112** further includes the baffle surface **122**. The baffle surface **122** is adapted to increase the spread of the liquid jet **202**, thereby increasing the deflection of the liquid jet **202** from the deflecting surface **114**. Consequently, the range of the liquid jet **202** is further reduced, enabling the liquid to reach areas closer to the sprinkler. Moreover, the deflector **112** also includes at least two directing surfaces **124** at each lateral side of the baffle surface **114**. The directing surfaces **124** are adapted to limit the spread of the liquid jet **202** due to the baffle surface **122**, such that the liquid jet **202** does not become too dispersed. It may be apparent to a person ordinarily skilled in the art that the present invention can be envisioned without the baffle surface and/or the directing surfaces **124**.

**[0033]** In the drawings and specification, there have been disclosed preferred embodiments and examples of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for the purpose of limitation, the scope of the invention being set forth in the following claims.

## 35 Claims

### 1. A sprinkler comprising:

a sprinkler head (**100**) comprising at least one nozzle (**106**), wherein the nozzle (**106**) comprises a nozzle body (**108**) and a nozzle opening (**110**), and wherein the nozzle (**106**) is configured to discharge a liquid jet (**202**) through the nozzle opening (**110**); and

a deflector (**112**) provided downstream of the nozzle (**106**), wherein the deflector (**112**) comprises a deflecting surface (**114**) which is in use in contact with the liquid jet (**202**) to adjust a range of the liquid jet (**202**);

an elongated guiding element (**120**) provided on the deflector (**112**) upstream of the deflecting surface (**114**), the guiding element (**120**) extending at an angle ( $\theta$ ) with respect to a direction of discharge (**D1**) of the liquid jet (**202**), wherein the angle ( $\theta$ ) lies in a range from about 45 degrees to 90 degrees, and wherein the guiding element (**120**) is in use in contact with the liquid jet (**202**) to direct splashed liquid from the de-

- flecting surface (114) back into the liquid jet (202), characterized in that, the deflector (112) is mounted on the sprinkler head (100) within a holding structure (126), and the guiding element (120) is in intimate contact with the nozzle body (108) and/or a wall element (128) of the holding structure (126) adjacent to the nozzle body (108).
2. The sprinkler of claim 1, wherein the guiding element (120) is resiliently biased against the nozzle body (108) and/or the wall element (128) of the holding structure (126) adjacent to the nozzle body (108).
  3. The sprinkler according to claim 2, wherein the deflector (112) is resiliently biased against the nozzle body (108) and/or the wall element (128) of the holding structure (126) adjacent to the nozzle body (108).
  4. The sprinkler according to any of claims 1 to 3, wherein the guiding element (120) is substantially needle shaped.
  5. The sprinkler according to any of the preceding claims, wherein the deflecting surface (114) is substantially roof shaped.
  6. The sprinkler according to claim 5, wherein the deflector (112) further comprises a baffle surface (122) adapted to in use increase a spread of the liquid jet (202) in the adjusting position of the deflector (112).
  7. The sprinkler according to claim 6, wherein the deflector (112) further comprises at least two directing surfaces (124) adapted to in use limit the spread of the liquid jet (202), wherein each directing surface (124) is positioned at each lateral side of the deflecting surface (114).
  8. The sprinkler according to any of the preceding claims, wherein the deflector (112) further comprises connecting portions (304) adapted to attach the deflector (112) to the sprinkler head (100).
  9. The sprinkler according to any of the preceding claims, wherein an actuator (118) is provided to move the deflector (112) with respect to the nozzle (106) between at least an adjusting position and an idle position, and wherein the guiding element (120) is in use in contact with the liquid jet (202) in the adjusting position, and the guiding element (120) is not in contact with the liquid jet (202) in the idle position.
  10. The sprinkler according to claim 9, wherein the deflector (112) is adapted to move in use in a direction which is oriented at an angle ( $\theta$ ) with respect to the direction of discharge (D1) of the liquid jet (202).
  11. The sprinkler according to claim 9, wherein the actuator (118) comprises a rotatable threaded element (208).
  12. The sprinkler according to any of the preceding claims, wherein the sprinkler is a pop-up sprinkler, and wherein the sprinkler head (100) is movable between an operating position and a retracted position.
  13. The sprinkler according to any of the preceding claims, wherein the sprinkler head (100) is rotatable about a rotational axis (R).
- 15 Patentansprüche**
1. Sprinkler, umfassend:
    - einen Sprinklerkopf (100), der mindestens eine Düse (106) umfasst, wobei die Düse (106) einen Düsenkörper (108) und eine Düsenöffnung (110) umfasst, wobei die Düse (106) zum Ausstoßen eines Flüssigkeitsstrahls (202) durch die Öffnung (110) konfiguriert ist; und
    - einen Deflektor (112), der stromabwärts der Düse (106) bereitgestellt ist, wobei der Deflektor (112) eine Ablenkoberfläche (114) umfasst, die bei Gebrauch in Kontakt mit dem Flüssigkeitsstrahl (202) ist, um einen Bereich des Flüssigkeitsstrahls (202) einzustellen;
    - ein lang gestrecktes Führungselement (120), das am Deflektor (112) stromaufwärts der Ablenkoberfläche (114) bereitgestellt ist, wobei sich das Führungselement (120) in einem Winkel ( $\theta$ ) in Bezug auf eine Ausstoßrichtung (D1) des Flüssigkeitsstrahls (202) erstreckt, wobei der Winkel ( $\theta$ ) in einem Bereich von etwa 45 Grad bis 90 Grad liegt und wobei das Führungselement (120) bei Gebrauch in Kontakt mit dem Flüssigkeitsstrahl (202) zum Richten von verschütteter Flüssigkeit von der Ablenkoberfläche (114) zurück in den Flüssigkeitsstrahl (202) steht, **dadurch gekennzeichnet, dass** der Deflektor (112) innerhalb einer Haltestruktur (126) am Sprinklerkopf (100) montiert ist und das Führungselement (120) in engem Kontakt mit dem Düsenkörper (108) und/oder einem Wandelement (128) der Haltestruktur (126) benachbart des Düsenkörpers (108) steht.
  2. Sprinkler nach Anspruch 1, wobei das Führungselement (120) elastisch an dem Düsenkörper (108) und/oder dem Wandelement (128) der Haltestruktur (126) benachbart des Düsenkörpers (108) vorgespannt ist.
  3. Sprinkler nach Anspruch 2, wobei der Deflektor (112) elastisch an dem Düsenkörper (108) und/oder dem

Wandelement (128) der Haltestruktur (126) benachbart des Düsenkörpers (108) vorgespannt ist.

4. Sprinkler nach einem der Ansprüche 1 bis 3, wobei das Führungselement (120) im Wesentlichen nadel­förmig ist. 5
5. Sprinkler nach einem der vorhergehenden Ansprüche, wobei die Ablenkoberfläche (114) im Wesentlichen dachförmig ist. 10
6. Sprinkler nach Anspruch 5, wobei der Deflektor (112) ferner eine Aufprallfläche (122) aufweist, die im Gebrauch zum Erhöhen einer Verteilung des Flüssigkeitsstrahls (202) in der Einstellposition des Deflektors (112) ausgelegt ist. 15
7. Sprinkler nach Anspruch 6, wobei der Deflektor (112) ferner mindestens zwei Richtoberflächen (124) aufweist, die im Gebrauch die Verteilung des Flüssigkeitsstrahls (202) begrenzen, wobei jede Richtoberfläche (124) auf jeder lateralen Seite der Ablenkoberfläche (114) angeordnet ist. 20
8. Sprinkler nach einem der vorhergehenden Ansprüche, wobei der Deflektor (112) ferner Verbindungsabschnitte (304) umfasst, die zum Befestigen des Deflektors (112) am Sprinklerkopf (100) ausgelegt sind. 25
9. Sprinkler nach einem der vorhergehenden Ansprüche, wobei ein Aktor (118) zum Bewegen des Deflektors (112) in Bezug auf die Düse (106) zwischen mindestens einer Einstellposition und einer Leerlaufposition bereitgestellt ist und wobei das Führungselement (120) im Gebrauch mit dem Flüssigkeitsstrahl (202) in der Einstellposition in Kontakt steht, und wobei das Führungselement (120) mit dem Flüssigkeitsstrahl (202) in der Leerlaufposition nicht in Kontakt steht. 30
10. Sprinkler nach Anspruch 9, wobei der Deflektor (112) im Gebrauch zum Bewegen in einer Richtung ausgelegt ist, die mit einem Winkel ( $\theta$ ) in Bezug auf die Ausstoßrichtung (D1) des Flüssigkeitsstrahls (202) ausgerichtet ist. 35
11. Sprinkler nach Anspruch 9, wobei der Aktor (118) ein drehbares Gewindeelement (208) umfasst. 40
12. Sprinkler nach einem der vorhergehenden Ansprüche, wobei der Sprinkler ein Aufklappsprinkler ist, und wobei der Sprinklerkopf (100) zwischen einer Betriebsposition und einer eingefahrenen Position beweglich ist. 45
13. Sprinkler nach einem der vorhergehenden Ansprüche, wobei der Sprinklerkopf (100) um eine Dreh-

achse (R) drehbar ist.

## Revendications

1. Extincteur automatique à eau comprenant :

une tête (100) d'extincteur automatique comprenant au moins un bec (106), dans laquelle le bec (106) comprend un corps (108) de bec et un orifice (110) de bec et dans laquelle le bec (106) est configuré pour déverser un jet liquide (202) par l'orifice (110) de bec ;

un déflecteur (112) disposé en aval du bec (106), dans lequel le déflecteur (112) comprend une surface (114) de déviation qui est en service en contact avec le jet liquide (202) pour régler la portée du jet liquide (202) ; et

un élément de guidage (120) allongé disposé sur le déflecteur (112) en amont de la surface (114) de déviation, l'élément de guidage (120) s'étendant en faisant un angle ( $\theta$ ) avec une direction de déversement (D1) du jet liquide (202), dans lequel l'angle ( $\theta$ ) se situe dans une plage allant d'environ 45 degrés à 90 degrés, et dans lequel l'élément de guidage (120) est en service en contact avec le jet liquide (202) pour ramener les éclaboussures de liquide de la surface (114) de déviation dans le jet liquide (202),

**caractérisé en ce que** le déflecteur (112) est monté sur la tête (100) d'extincteur automatique à l'intérieur d'une structure de maintien (126), et **en ce que** l'élément de guidage (120) est en contact intime avec le corps (108) de bec et/ou un élément (128) de paroi de la structure de maintien (126) adjacent au corps (108) de bec. 50

2. Extincteur automatique selon la revendication 1, dans lequel l'élément de guidage (120) est sollicité élastiquement contre le corps (108) de bec et/ou l'élément (128) de paroi de la structure de maintien (126) adjacent au corps (108) de bec. 55

3. Extincteur automatique selon la revendication 2, dans lequel le déflecteur (112) est sollicité élastiquement contre le corps (108) de bec et/ou l'élément (128) de paroi de la structure de maintien (126) adjacent au corps (108) de bec.

4. Extincteur automatique selon l'une quelconque des revendications 1 à 3, dans lequel l'élément de guidage (120) est sensiblement en forme d'aiguille.

5. Extincteur automatique selon l'une quelconque des revendications précédentes, dans lequel la surface (114) de déviation est sensiblement en forme de toit.

6. Extincteur automatique selon la revendication 5,

dans lequel le déflecteur (112) comprend en outre une surface (122) de chicane apte en service à augmenter l'étalement du jet liquide (202) dans la position de réglage du déflecteur (112).

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7. Extincteur automatique selon la revendication 6, dans lequel le déflecteur (112) comprend en outre au moins deux surfaces directrices (124) aptes en service à limiter l'étalement du jet liquide (202), dans lequel chaque surface directrice (124) est placée au niveau de chaque côté latéral de la surface (114) de déviation. 10
8. Extincteur automatique selon l'une quelconque des revendications précédentes, dans lequel le déflecteur (112) comprend en outre des parties de raccordement (304) aptes à fixer le déflecteur (112) à la tête (100) d'extincteur automatique. 15
9. Extincteur automatique selon l'une quelconque des revendications précédentes, dans lequel un actionneur (118) est utilisé pour déplacer le déflecteur (112) par rapport au bec (106) entre au moins une position de réglage et une position d'arrêt, et dans lequel l'élément de guidage (120) est en service en contact avec le jet liquide (202) dans la position de réglage et l'élément de guidage (120) n'est pas en contact avec le jet liquide (202) dans la position d'arrêt. 20  
25  
30
10. Extincteur automatique selon la revendication 9, dans lequel le déflecteur (112) est apte à se déplacer en service dans une direction qui est orientée sous un angle ( $\theta$ ) avec la direction de déversement (D1) du jet liquide (202). 35
11. Extincteur automatique selon la revendication 9, dans lequel l'actionneur (118) comprend un élément fileté (208) rotatif. 40
12. Extincteur automatique selon l'une quelconque des revendications précédentes, dans lequel l'extincteur automatique est un extincteur télescopique et dans lequel la tête (100) d'extincteur automatique est mobile entre une position de fonctionnement et une position rentré. 45
13. Extincteur automatique selon l'une quelconque des revendications précédentes, dans lequel la tête (100) d'extincteur automatique peut tourner autour d'un axe de rotation (R). 50

55

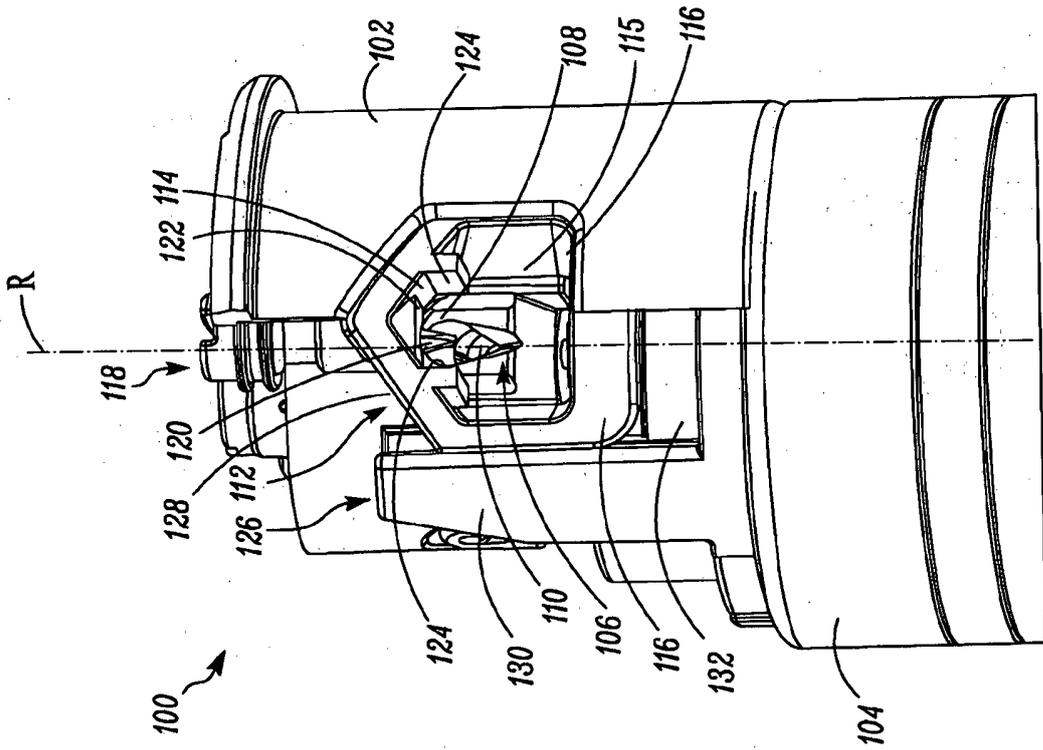


FIG. 1B

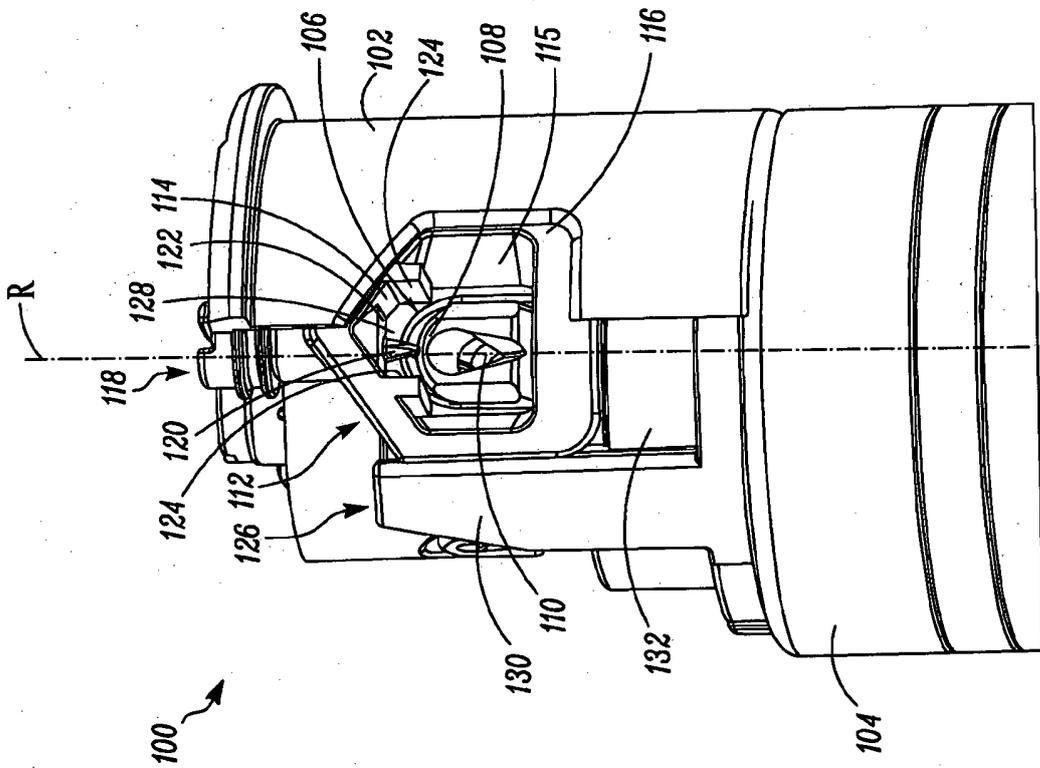


FIG. 1A

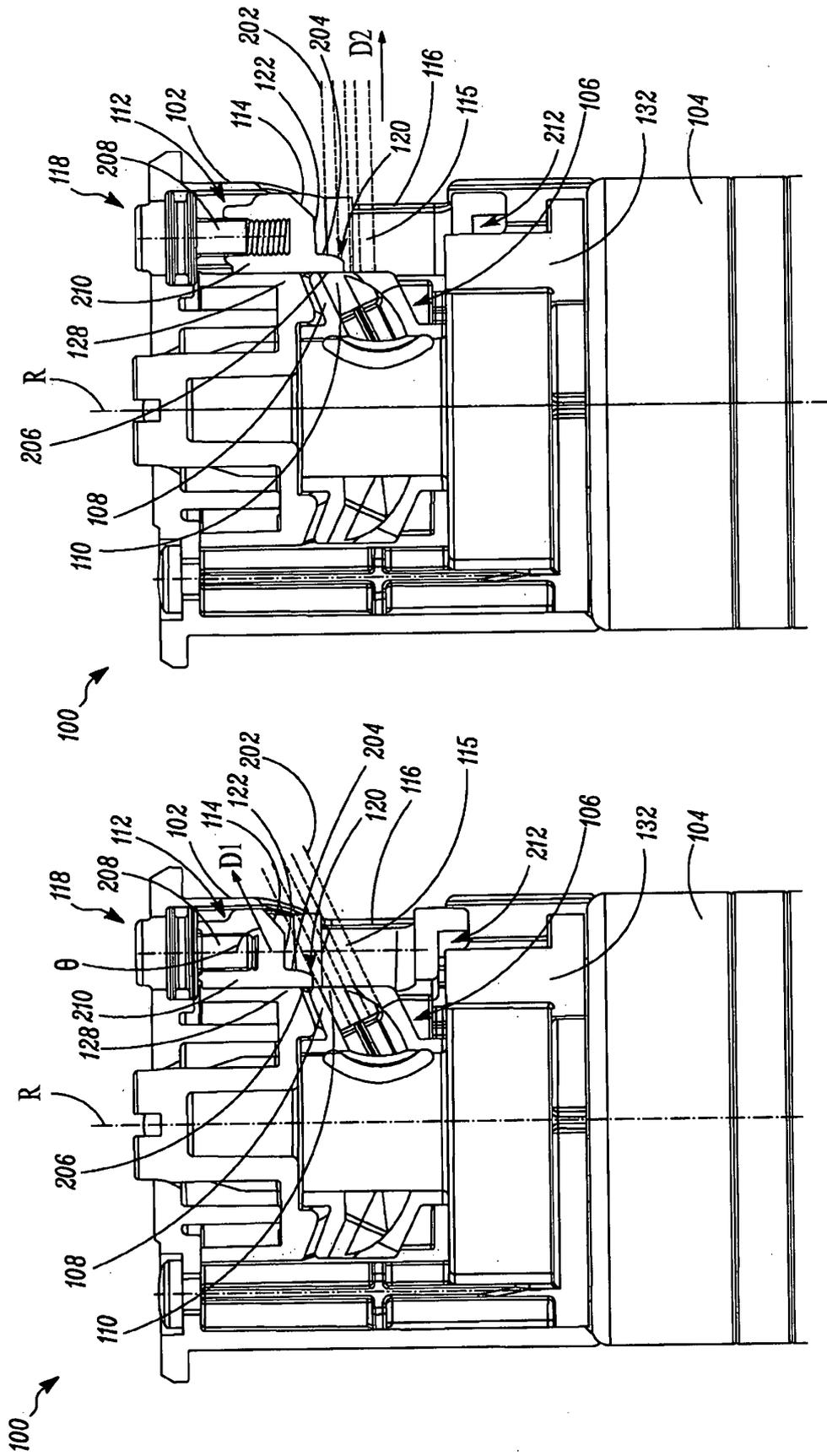


FIG. 2B

FIG. 2A

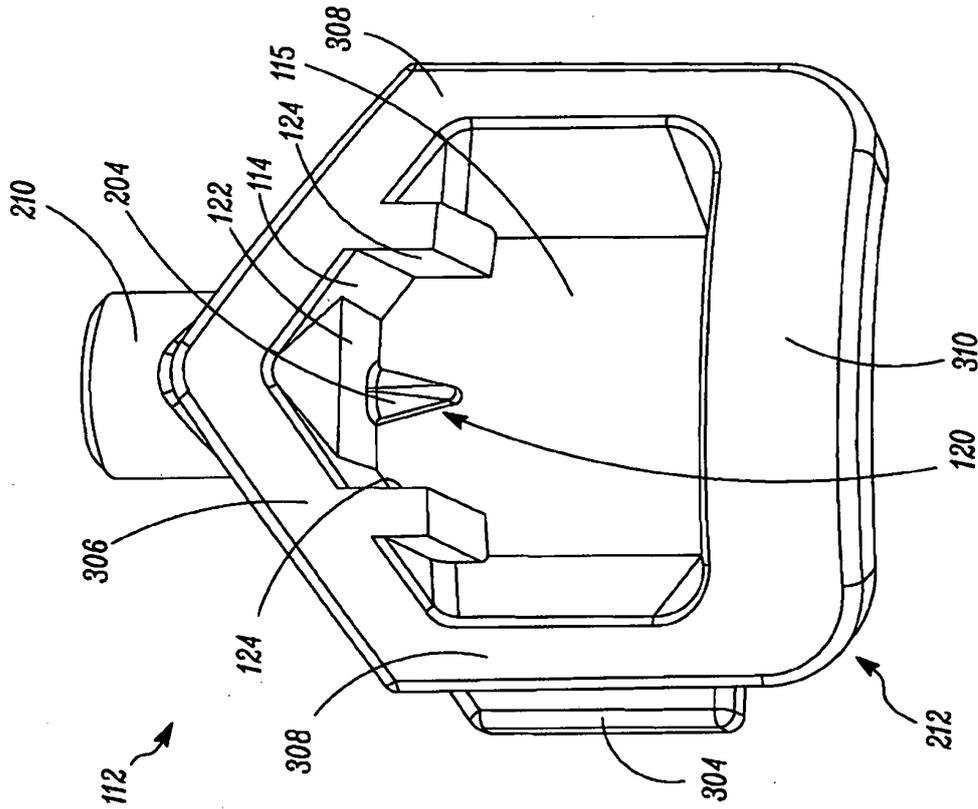


FIG. 3B

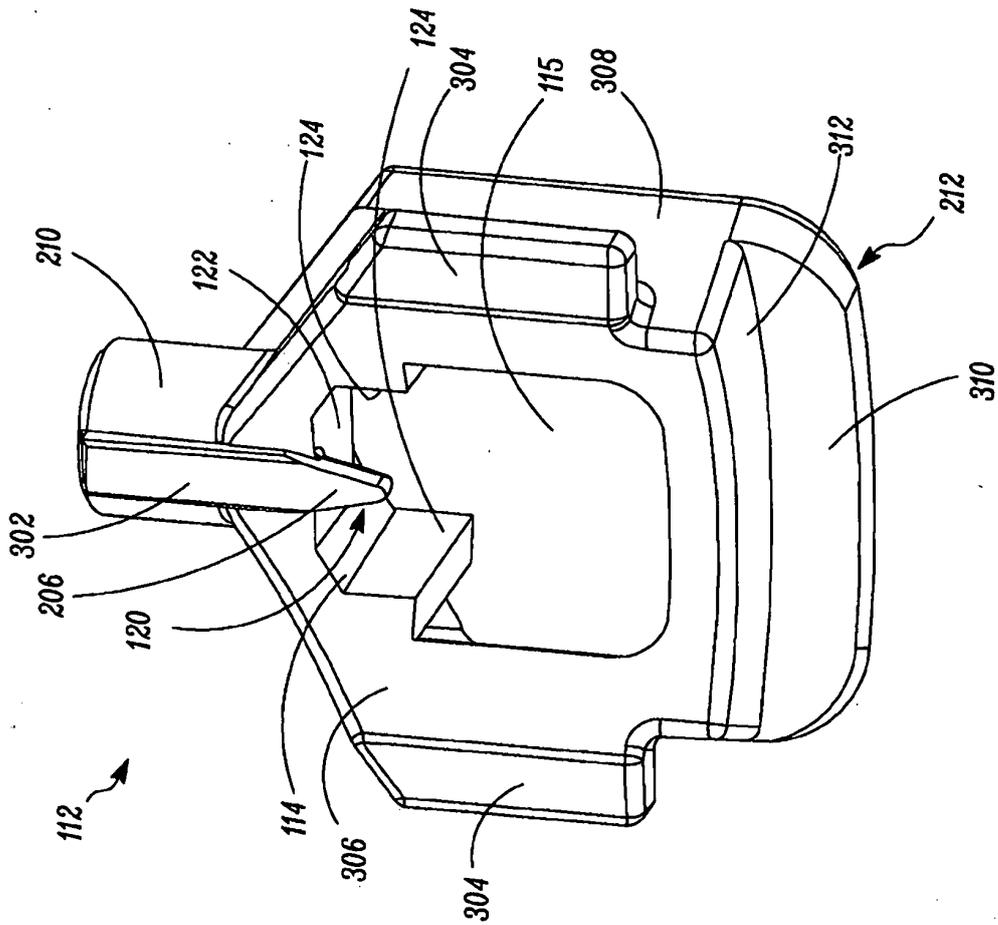


FIG. 3A

**REFERENCES CITED IN THE DESCRIPTION**

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