May 26, 1970 M. J. FREED 3,514,042

MULTIPLE PURPOSE HOSE NOZZLE

Filed Aug. 21, 1967

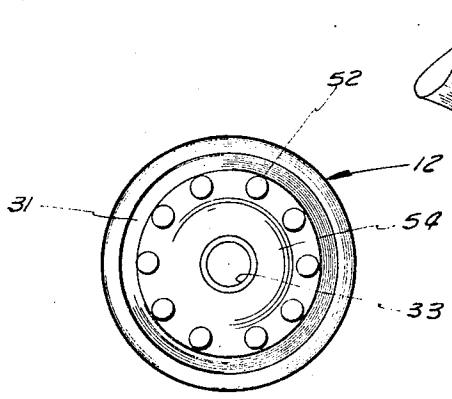

FIG.4

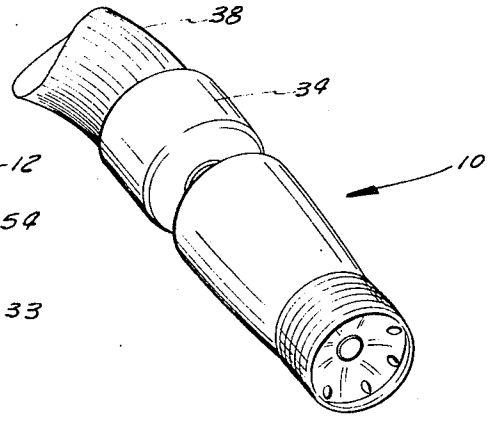

FIG.1

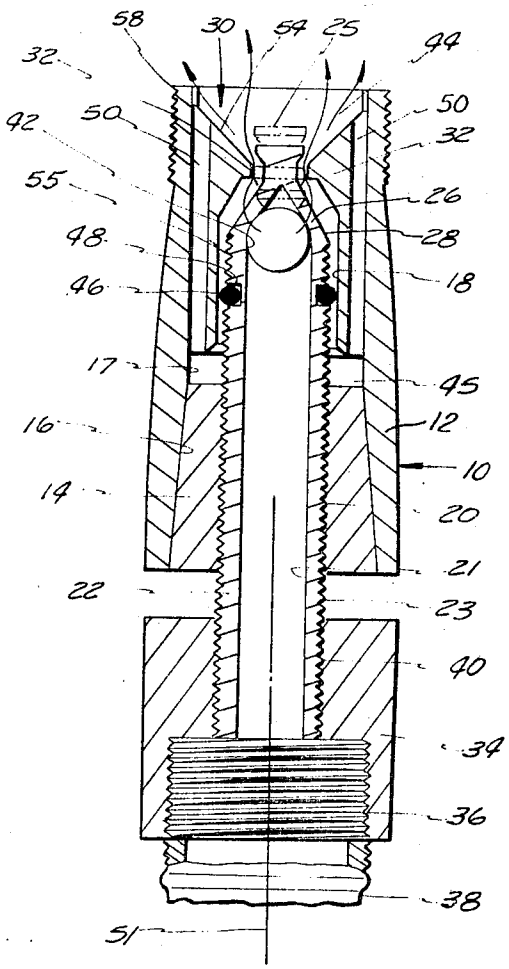

FIG.2

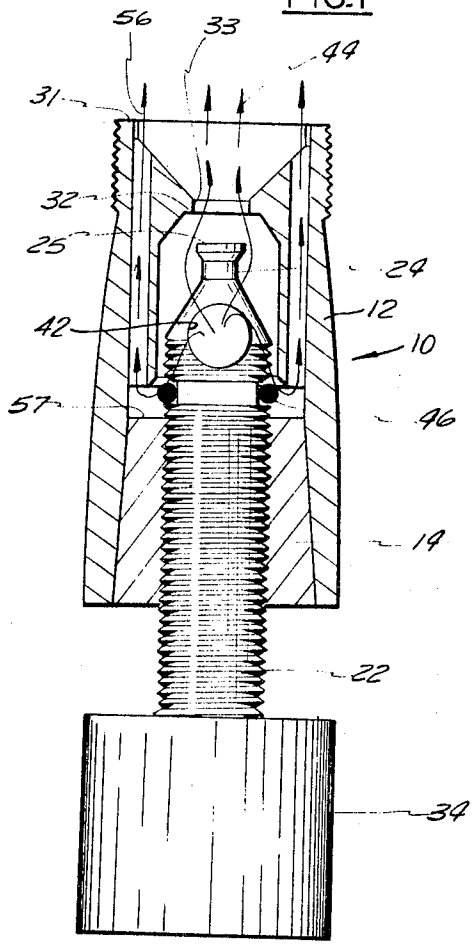

FIG.3

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MULTIPLE PURPOSE HOSE NOZZLE

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ABSTRACT OF THE DISCLOSURE

A multiple purpose nozzle which can be connected directly to a sprinkler, additional hose extension or the like to serve as a connector and which can also be used as a standard spray nozzle or as a soaking nozzle.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to nozzles and more particularly to a multiple purpose hose nozzle which is designed for attachment to a hose for use as a conventional spray nozzle, a soaking nozzle, or for direct connection to a separate sprinkler member, or additional hose length or the like without having to be removed from the hose.

Description of the prior art

Hose nozzles of this general type which are designed to function as both a soaking type nozzle and a spray type nozzle are known in the prior art. Also it is known in the prior art to provide nozzles wherein the head end is threaded for the application of additional hose lengths or various types of spraying devices. An example of a nozzle of the first type is found in U.S. Pat. No. 3,111,273, issued Nov. 19, 1963, and an example of a nozzle of the latter type is found in U.S. Pat. No. 2,629,633, issued Feb. 24, 1953. Among the disadvantages of these prior art nozzles are unnecessary bulkiness, rendering the nozzle unhandy in use, and impractical in structure, making the nozzle difficult to manufacture, and hence unnecessarily high in cost. Also, the complex design of these nozzles limits their use for the average garden hose application due to the fact that their complicated design requires frequent maintenance or careful handling in order to prevent clogging or rusting.

SUMMARY

According to the present invention, these difficulties are eliminated by the design of a sturdy and durable multiple purpose nozzle which can be permanently retained on the hose by serving as a connector for attachment to any conventional sprinkler, hose extension or the like. Due to the fact that the nozzle of the instant invention has a central exit flow passage and an outer exit flow passage wherein both passages can be fed simultaneously together with other unique design features, it can be used as a connector without undue hindrance with the hydraulic flow through the nozzle.

It is accordingly one of the objects of the present invention to provide a sturdy and durable nozzle to be used as a standard nozzle, a soaking nozzle and a connector.

It is also an object of this invention to provide a nozzle wherein the fluid flow can be adjusted to provide for simultaneous inner and outer fluid flow passages to enable the nozzle to function as a connector or as a soaking nozzle.

Another object of the invention is to provide a nozzle whose overall dimensions are substantially less than conventional nozzles, yet all of the individual components thereof are of such sturdy design that such components may be conventionally manufactured from light weight

material such as aluminum, magnesium, plastic or the like without fear of structural failure.

DESCRIPTION OF THE DRAWINGS

The exact nature of the invention as well as other objects and advantages thereof will be readily apparent from consideration of the following specification relative to the attached drawings in which

FIG. 1 is a perspective view of the nozzle of the present invention;

FIG. 2 is a longitudinal vertical section through the nozzle illustrating parts thereof in one position.

FIG. 3 is a view similar to FIG. 2, but illustrating parts of the nozzle in another position;

FIG. 4 is an end view of the nozzle of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, FIG. 1 shows applicant's device indicated generally at **10** in use as a conventional nozzle. As seen best in FIG. 2, the nozzle **10** has an outer sleeve **12** which has a frusto-conical shaped inner sleeve **14** received in an outwardly flaring or tapering bore **16** at one end thereof. The bore **16** blends into the cylindrical bore **17** which in turn communicates with inner bore **18**. The sleeve **14** is internally threaded as at **20** to threadably receive the tubular core member generally indicated at **22**, externally threaded as at **23**. The core member **22** is provided with a reduced extension **24** having head **25** at its extremity and joined to the tube **22** by the conical portion **26**.

The exterior surface **28** of the conical portion **26** together with the head **25**, serves as the nozzle valve. Integrally formed with the sleeve member **12** is an annular throttling nozzle, generally indicated at **30**, positioned forwardly of the cylindrical bore **18** and having inwardly projecting shoulder **32** to define a minimum diameter passage or orifice **33**.

The nozzle assembly **10** includes a coupling member **34** which is internally threaded at one end **36** for connection with the hose **38** or the threaded end of any suitable form of conduit. The coupling member **34** is provided with a second internally threaded portion **40** threaded onto the rear end of core **22**, as shown in FIG. 2. As the coupling member **34** operates unitarily with the core **22** it may be formed integral with the core or it may conveniently comprise the threaded assembly of members **22** and **34** as shown. In this way flow from the hose **38** flows through the core passage **21** and out the aligned orifices **42** at the conical end **26**.

Suitable means to seal the central passage **44**, such as the O-ring **46**, is positioned around the core member **22** in the annular groove **48**. Around the outer periphery of the nozzle **30** are a plurality of uniformly spaced outer tubular exit passages **50** arranged so that their principal axes are parallel to the axis **51** of the nozzle assembly **10** with their exit ends located within the conical face **54**. A passage **55** is provided around the valve head of core **22** communicating with the orifices **42**.

From the front of the valve head to the rear, the central passage **44** comprises the minimum diameter orifice **33** which can be engaged by the conically shaped surface **28** for cutting off fluid flow through the nozzle. Immediately rearward of the orifice **33** the cylindrical bore **18** is of sufficient diameter to provide the large clearance **55** for unimpeded fluid flow around the core member **22**.

A second outer flow passage **56**, comprising the tubular passages **50**, is provided to function with the flow passage **44**, as seen in FIG. 3, upon axial movement of the sleeve member **12** away from member **34** in response to rotation of the sleeve relative to the core member **22**. As the O-ring **46** is moved out of sealing engagement with bore **18**, the clearance passage **55** is brought into com-

munication with the enlarged annular chamber **45** which, in cooperation with the exit passages **50**, provides the outer flow path **56**.

It will be seen in FIG. 3 that when the O-ring **46** is within the chamber **45** flow from the passage **21** will exit simultaneously via the inner flow passage **44** and the outer flow passage **56** to provide the soaking or "sprinkler can" nozzle arrangement of the invention. Further rotation of sleeve **12** will move the end wall **57** of sleeve **14** into sealing engagement with the O-ring **46** to seal the chamber **45** and to provide a lock to prevent the unthreading of sleeve **12** from core member **22**.

With the nozzle in the position described in FIG. 3 it can be seen that the flow paths **44** and **56** also allow the nozzle to function as a connector by having the external threads **58** for connection of a conventional lawn sprinkler, hose length or the like. By means of the simultaneous flow through the paths **44** and **56** applicant has achieved a nozzle design that minimizes the hydraulic loss through the nozzle to enable its use as a connector as well as a conventional and soaker nozzle.

It will be noted that chamber **45** is sealed by the sleeve **14** due to the wedging fit that is attained between the frusto-conical sleeve **14** and flared bore **16**. Also, the axial length of the chamber **45** is accurately determined by the wedge fit of sleeve **14** so as to allow for proper flow to passages **50**. A slight conical counterbore **59** is provided at the mouth of bore **18** to allow for smooth entry of O-ring **46** into the bore **18**.

In the position of the nozzle in FIG. 3 wherein both flow passages **44** and **56** are provided, it can be seen that nozzle member functions as a soaking nozzle. By means of applicant's design only a slight rotation of sleeve **12** will be sufficient to effect the necessary axial movement to change the nozzle member from a hard spray position to the soaking nozzle position of FIG. 3.

It will be appreciated that by locating the exit ends of the passages **50** within the conical surface **54**, so as to be recessed from the end **31** of the nozzle, applicant not only attains the aforementioned "sprinkler can" nozzle adjustment but also, when the outer threaded end **58** is connected to an internally threaded coupling on a sprinkler, for example, provide for smooth hydraulic flow between the nozzle and the sprinkler conduit.

In this regard the location and size of the aligned orifices **42**, wherein their transverse axis is located substantially in the plane of the base of conical portion **26**, assists in the hydraulic flow through passages **44** and **56**. The portion of the orifices **42** extending through conical portion **26** allows forward flow through passage **44**, while also providing for transverse flow by means of passage **55** and chamber **45** which feed exit passages **50**. The orifices **42** have a diameter substantially equal to the diameter of internal core passage **21** to provide for maximum flow through the nozzle.

The external surface of the sleeve **12** can be provided with longitudinal ribs (FIG. 1) to facilitate the grasping and rotating of the sleeve with respect to the core member by the finger of the operator.

What is claimed is:

1. A nozzle comprising,

(a) an outer sleeve member having a throttling nozzle at one end thereof, a central bore extending between said throttling nozzle and a counterbored portion at the opposite end,

(b) a tubular core member adjustably positioned within said central bore of said sleeve member having one end adapted to be connected to a fluid outlet and a valve head portion on its opposite end for cooperation with said throttling nozzle, said core member having orifice means adjacent its head portion,

(c) a central passage between said core member and said sleeve providing communication between said orifice means and said throttling nozzle,

(d) an inner sleeve positioned in the counterbore portion of said outer sleeve member so as to define a chamber between said inner sleeve and the shoulder of the counterbore portion,

(e) outer fluid exit means in said sleeve member communicating with said orifice means, and

(f) said core member operative for positioning said orifice means in a first position communicating with said throttling nozzle and a second position for simultaneously communicating with both said throttling nozzle and said outer exit means.

2. The nozzle as defined in claim **1** wherein said outer exit means comprises a plurality of passages disposed around said throttling nozzle with their axes positioned substantially parallel to the axis of the nozzle.

3. The nozzle as defined in claim **1** and in which:

(a) said inner sleeve has a frusto-conical configuration, and

(b) the counter-bore is outwardly tapered to wedgingly receive said inner sleeve.

4. The nozzle as defined in claim **1** wherein said plurality of exit passages are located within the peripheral confines of the chamber.

5. The nozzle as defined in claim **1** wherein said plurality of exit passages are located within the conical counter-bore of said throttling nozzle.

6. The nozzle as defined in claim **1** wherein said core member has sealing means positioned therein for regulating the fluid flow of said nozzle between said first and second positions.

7. The nozzle as defined in claim **1** wherein:

(a) said core member having a frusto-conical portion between said head portion and said tubular portion, and

(b) said core orifice means comprising aligned openings located so that the openings extend on either side of the transition between the tubular portion and the frusto-conical portion of said core member.

8. The nozzle as defined in claim **6** wherein said sealing means comprises a single O-ring positioned in said core member.

9. The nozzle as defined in claim **1** wherein said outer sleeve has external threads adjacent its throttling end for connection to a standard sprinkler or hose extension.

10. A nozzle comprising

a sleeve member having an outlet at one end thereof, a central passage extending between said outlet and the opposite end,

said outlet having a reduced diameter section disposed within said central passage,

a core member adjustably positioned within said sleeve member central passage, having a central passage adapted for connection at one end with a fluid outlet and having a frusto-conical valve head portion at the opposite end, said core member being provided with means adjacent said valve head portion connecting said core member central passage with said sleeve member central passage whereby said valve head portion and said reduced diameter section of said outlet cooperate to regulate fluid flow through said outlet with said core member being adjustable between a first position closing fluid flow through said outlet and a second position wherein fluid flow through said reduced diameter portion is unrestricted by said valve portion,

said sleeve member central passage provided with an increased diameter portion disposed inwardly from said outlet to form a chamber and a plurality of annularly spaced axially extending passages registering with said chamber, and

sealing means mounted on and disposed between said core member and said sleeve member central passage intermediate said core member connecting means and said chamber and movable with said core member from said sleeve member central pas-

sage and into said chamber upon adjustment of said core member to said second position so that fluid may flow simultaneously through said reduced diameter portion and around said core member and into said chamber and through said axially extending passages.

11. The nozzle as defined in claim **10**, and in which said sleeve member has external threads adjacent its outlet end for connection to a standard sprinkler or hose extension.

References Cited

UNITED STATES PATENTS

1,973,371	9/1934	Charles et al.	239—438
2,218,411	10/1940	Albach et al.	239—441
2,629,633	2/1953	Wright	239—448 X
3,001,725	9/1961	Lockett	239—458
3,058,670	10/1962	Marotto et al.	239—458 X
3,111,273	11/1963	Mei	239—441 X
3,363,842	1/1968	Burns	239—441

FOREIGN PATENTS

180,911	11/1935	Switzerland.

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U.S. Cl. X.R.

239—438, 441, 448