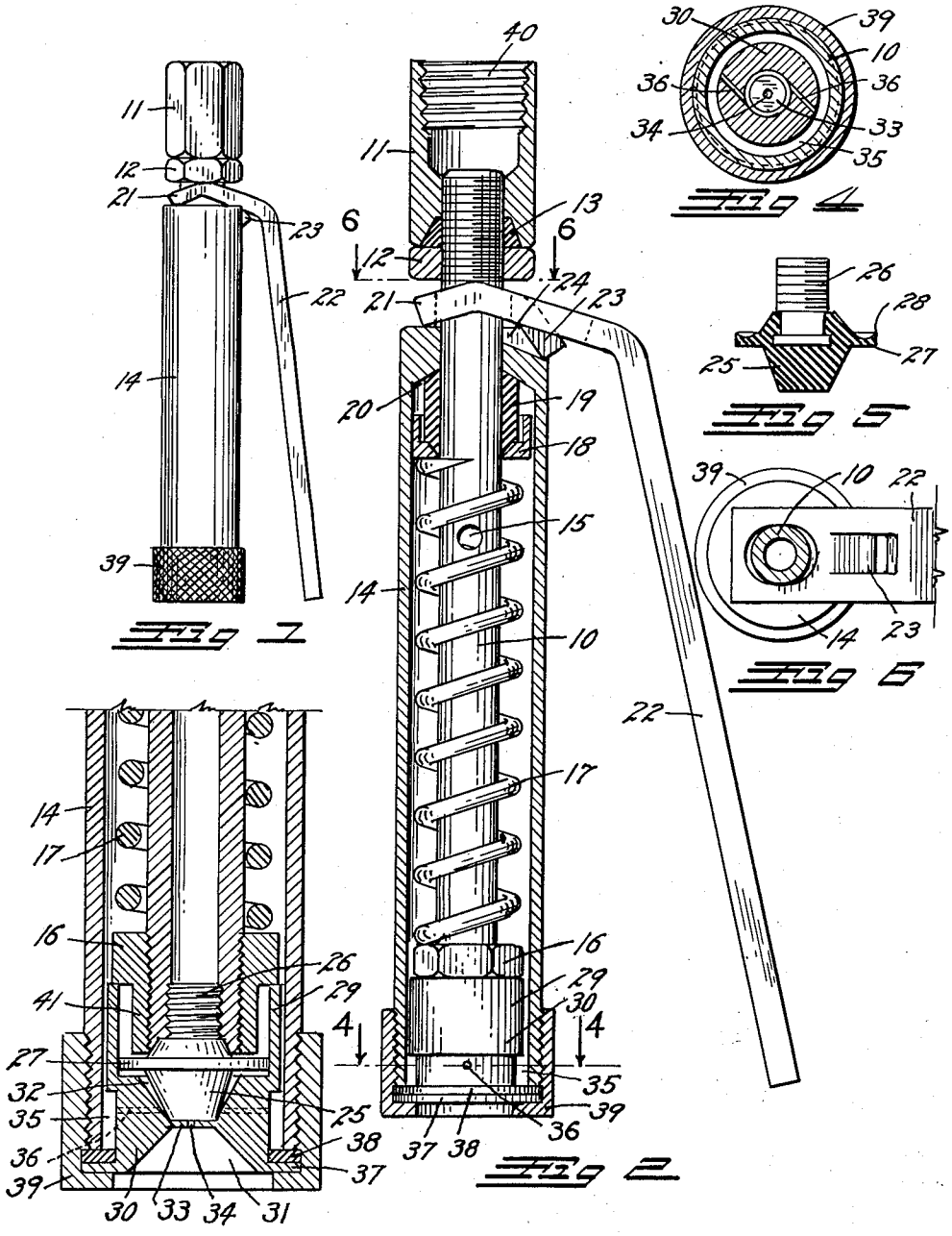
Aug. 14, 1956 T. C. LEISENRING 2,758,873

SPRAY GUNS

Filed April 9, 1956



INVENTOR.

THEODORE C. LEISENRING

BY

ATTORNEY

United States Patent Office 2,758,873 Patented Aug. 14, 1956

2,758,873

SPRAY GUNS

Theodore C. Leisenring, Denver, Colo.

Application April 9, 1956, Serial No. 576,914

8 Claims. (Cl. 299—118)

This invention relates to a water spray nozzle of the type more particularly designed for use in cleaning and pressing establishments for spraying clothing prior to ironing, and in grocery and food stores for spraying vegetables and fruits.

The principal object of the present invention is to provide an exceedingly small spray nozzle which will highly atomize the water to provide a spray approaching the fineness of smoke or steam; to provide a spray nozzle which can be instantly and accurately controlled; and to provide a nozzle which will not form drops of water at any time, either during the spraying or at the termination thereof.

Another object of the invention is to provide a nozzle of this character which can be easily and economically formed as a screw machine product so that manufacturing costs will be greatly reduced.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a full size side elevation of the improved nozzle;

Fig. 2 is an enlarged, vertical, longitudinal section through the improved nozzle;

Fig. 3 is a still further enlarged, longitudinal section through the lower portion of the nozzle;

Fig. 4 is a horizontal cross-section taken on the line 4—4, Fig. 2;

Fig. 5 is an enlarged, detail, sectional view of a plug valve employed in the improved nozzle; and

Fig. 6 is a fragmentary detail section taken on the line 6—6, Fig. 2.

The improved nozzle is formed about an axial water tube **10** which is externally threaded at both its upper and lower extremities, and internally threaded at its lower extremity. A hose coupling **11**, provided with standard hose threads **40**, is threaded onto the upper external threads of the water tube **10** and is locked in preset position on the threads by means of a lock nut **12** which is threaded on the tube against the lower extremity of the coupling **11**. A wedge-shaped, resilient sealing washer **13** is compressed into a receiving socket in the bottom of the coupling **11** by the lock nut **12** to prevent leakage about the external threads of the water tube.

A nozzle barrel **14** having a closed top and an open bottom is fitted over the lower portion of the water tube **10**, and the latter is provided with water discharge ports **15** to allow water to discharge from the tube **10** into the barrel **14**. The barrel **14** is secured in place on the water tube **10** by means of a lower nut **16** which is

threaded onto the lower external threads of the tube. The nut **16** is formed with a downwardly-extending, cylindrical portion **41**.

The nut **16** supports a helical compression spring **17** which surrounds the tube **10**. The upper extremity of the spring **17** acts against a gland cup **18** and forces the latter against a compressible gland **19** so as to force the latter into a conical depression **20** in the upper extremity of the barrel **14** to seal the latter extremity of the barrel to the water tube **10**.

A prying lever member **21** is positioned about the water tube **10** between the upper extremity of the barrel **14** and the lock nut **12** and is resiliently clamped between the latter two elements by the expansive action of the spring **17**. The lever **21** terminates in a grip handle **22** extending downwardly and outwardly alongside the barrel **14**. A locking tongue **23** is stamped from and bent downwardly from the lever **21** to extend into a receiving notch **24** formed in the upper extremity of the barrel. The tongue **23** acts to prevent relative rotation between the barrel **14** and the handle **22**, and also serves as a prying fulcrum for the lever **21**. As the handle **22** is moved toward the barrel **14**, the tongue **23** will engage the bottom of its notch **24** so that the extremity of the lever about the water tube **10** will act upwardly against the handle **22** while the locking tongue pries the barrel **14** downwardly to urge the two apart.

A resilient, conical plug valve **25** is molded about a threaded stud **26** which is threaded into the internal threads in the lower extremity of the water tube **10** so as to seal off the latter and fixedly maintain the valve thereon. The valve **25** is provided with a peripheral flange **27**, the upper surface of which is formed with an annular groove which forms an upturned feather-edge **28** about the flange. The flange **27** is axially slidable in a guide cup **29** which surrounds and is spaced from the cylindrical portion **41** of the nut **16**. The cup **29** is formed on a cylindrical orifice block **30** provided with an upper conical depression **32**, into which the conical plug valve **25** extends, and with a second conical depression **31** in its lower surface. The bottoms of the two depressions **31** and **32** are flat and are spaced from each other by a relatively thin partition portion **33** provided with a central spray orifice **34**.

The outer wall of the orifice block **30** is inset to provide a peripheral water chamber **35**. A plurality, preferably two, of tangential water passages **36** extend from the water chamber **35** through the wall of the first depression **32**. The water passages **36** are exceedingly small, approximately No. 44 drill, and they extend tangentially in a common direction to the circumference of the partition portion **33**. The spray orifice **34** is substantially the same diameter as the passages **36**.

The lower extremity of the orifice block **30** is provided with a peripheral flange **37** which is clamped against a sealing gasket **38**, and the latter is clamped against the lower extremity of the barrel **14** by means of a knurled terminal cap **39** which is threaded upon external threads formed on the open lower extremity of the barrel **14**.

In use, the improved spray nozzle is mounted on the extremity of a water hose, the terminal fitting of the hose being threaded into the internal threads **40** of the coupling **11**. The water from the hose will flow into the tube **10** and through the ports **15** into the barrel **14**. The pressure of the water within the guide cup **29** expands the feather-edge **28** of the resilient flange **27** against the wall of the cup so that the water cannot pass downwardly within the cup to the upper depression **32**. The water therefore must flow externally of the cup **29** to the water chamber **35**.

When the barrel **14** and the handle **22** are gripped by the hand toward each other, the plug valve **25** and the partition portion **33** will separate, allowing jets of water

to enter the first depression **32** to create a whirling action therein. The whirling water then exits through the discharge orifice **34** in an exceedingly fine, steam-like, atomized spray. When the handle **22** is released, the spring **17** firmly forces the plug valve into the upper depression **32** to seal the passages **26** and the discharge orifice **34**. Due to the resiliency of the material of the plug valve **25**, it will expand under the action of the spring **17** to completely fill the upper depression **32**.

It has been found, with certain types of spray nozzles, that when they are shut off a small amount of water will remain in the discharge passages exteriorly of the valve, and this water will form a drop which is exceedingly annoying when it drops upon fabrics in a pressing establishment. It will be noted that the only discharge passage in this improved nozzle is the discharge orifice **34**, and the length of this orifice equals only the thickness of the partition portion **33**, which is exceedingly thin, being approximately .007 of an inch. Therefore, it is impossible for sufficient water to be retained to form a drop. Any moisture remaining in the orifice **34** will be retained by capillary attraction.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A spray nozzle comprising: a water tube having upper and lower external threads and lower internal threads; a hose coupling threaded upon the upper external threads of said water tube; a lock nut threaded against said coupling; a sealing washer compressed by said lock nut into a cavity in said coupling about said threads; a tubular barrel surrounding the lower extremity of said water tube, said barrel having a closed upper extremity and an externally threaded open lower extremity; a lower nut threaded on said water tube within said barrel; a spring compressed between said nut and the closed upper extremity of said barrel so as to constantly urge said barrel upwardly; a valve member mounted on the lower extremity of said water tube and extending downwardly therefrom; an orifice member mounted in the open lower extremity of said barrel and provided with a central spray orifice, said spring acting to force said orifice block against said valve member to maintain said spray orifice closed; and means for urging said valve member from said orifice member to open said spray orifice.

2. A spray nozzle comprising: a water tube having upper and lower external threads and lower internal threads; a hose coupling threaded upon the upper external threads of said water tube; a lock nut threaded against said coupling; a sealing washer compressed by said lock nut into a cavity in said coupling about said threads; a tubular barrel surrounding the lower extremity of said water tube, said barrel having a closed upper extremity and an externally threaded open lower extremity; a lower nut threaded on said water tube within said barrel; a spring compressed between said nut and the closed upper extremity of said barrel so as to constantly urge said barrel upwardly; a valve member mounted on the lower extremity of said water tube and extending downwardly

therefrom; an orifice member mounted in the open lower extremity of said barrel; an upper conical cavity formed in said orifice member; a lower conical cavity formed in said orifice member; a relatively thin, flat partition portion forming the bottoms of and separating said two cavities; a central spray orifice formed in said partition portion against which said plug valve is urged by said spring; manual means for separating said plug valve and said partition portion; and means for supplying water from said water tube to said upper depression.

3. A spray nozzle as described in claim 2 in which the means for supplying water comprises: an annular water chamber surrounding said orifice block, said water chamber being in communication with the interior of said barrel so as to receive water therefrom; and a plurality of tangentially positioned water passages extending from said water chamber to said upper depression.

4. A spray nozzle as described in claim 3 having a guide cup extending upwardly from said orifice block and surrounding said plug valve; and a resilient flange formed on said plug valve and extending into sealing relation with said cup to prevent water from flowing from said cup to said upper depression.

5. A spray nozzle as described in claim 4, in which the flange on said plug valve has an upwardly extending feathered edge adapted to be forced against the internal wall of said cup by the pressure of the water on said flange.

6. A valve for spray nozzles of the type having a water tube and a longitudinally movable barrel surrounding said water tube, comprising: a resilient plug valve; a threaded stud molded into said plug valve and threaded into the lower extremity of said water tube; a circular orifice block; a peripheral lower flange formed on said block; a terminal cap threaded on said barrel and acting against said flange to support said block within the lower extremity of said barrel; a guide cup extending upwardly from said block about the lower extremity of said water tube and about said valve; an upper depression formed in said block into which said valve extends; a flange formed on said valve and acting to seal the latter within said guide cup; an annular water chamber surrounding said orifice block; water passages extending from said water chamber into said upper depression at a tangent to the circumference of the latter; and a spray orifice formed in the bottom of said upper depression.

7. A valve for spray nozzles as described in claim 6 having a lower depression extending upwardly into said orifice block, said two depressions being separated by a relatively thin, flat partition portion containing said spray orifice.

8. A valve for spray nozzles as described in claim 7 having an upwardly extending, relatively thin, feathered edge on said flange to enable the pressure of the water thereon to spread said flange against the internal wall of said guide cup.

References Cited in the file of this patent

UNITED STATES PATENTS

2,281,142	Davis	Apr. 28, 1942
2,457,993	Fletcher et al.	Jan. 4, 1949
2,576,534	Paasche	Nov. 27, 1951
2,623,790	Smith	Dec. 30, 1952