United States Patent

Hales

[15] **3,673,827**

[45] **July 4, 1972**

[54] MANUAL STEAMING APPARATUS

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[21] Appl. No.: **47,895**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 765,308, Oct. 7, 1968, abandoned.

[52] **U.S. Cl.** **68/222,** 239/532, 239/550

[51] **Int. Cl.** **D06c 1/00**

[58] **Field of Search** ..... 239/568, 597, 598, 601, 450, 239/525, 526, 530, 532, 550; 15/322, 302; 401/285; 68/5 R, 222, 240, 6

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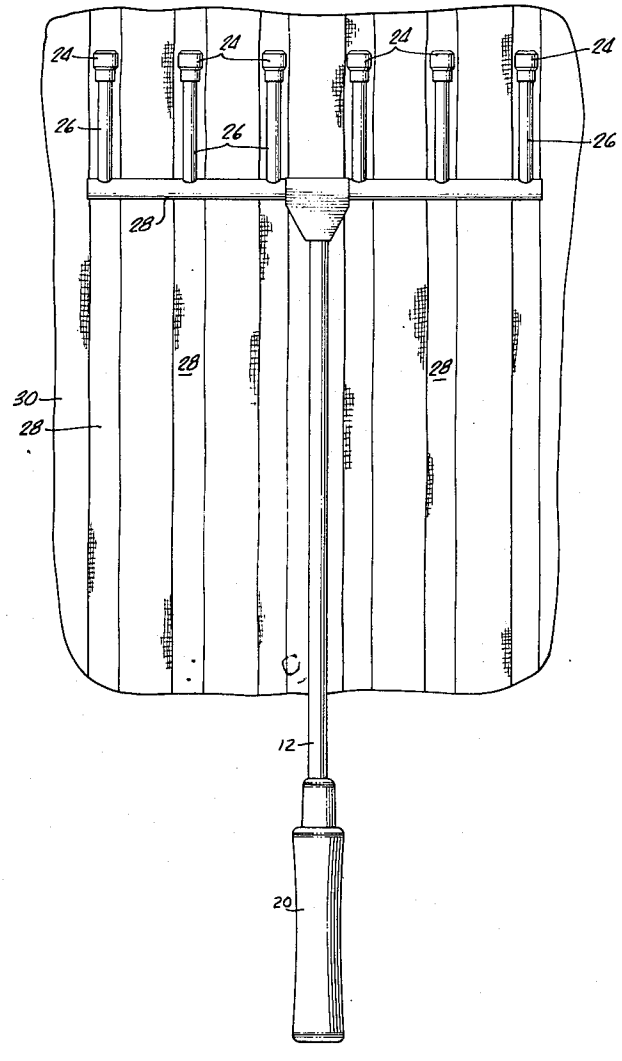
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[57] **ABSTRACT**

A novel manual steaming apparatus is disclosed with an improved balanced handle which is offset from the steam delivery tube and affixed axially thereto by a strap which is embedded in the handle. The steaming apparatus employs direct-spray nozzles with openings arranged to give a spray configuration which is inclined to the horizontal sufficient to prevent substantial overlap and interspray condensation, and to effect better steam penetration.

12 Claims, 6 Drawing Figures



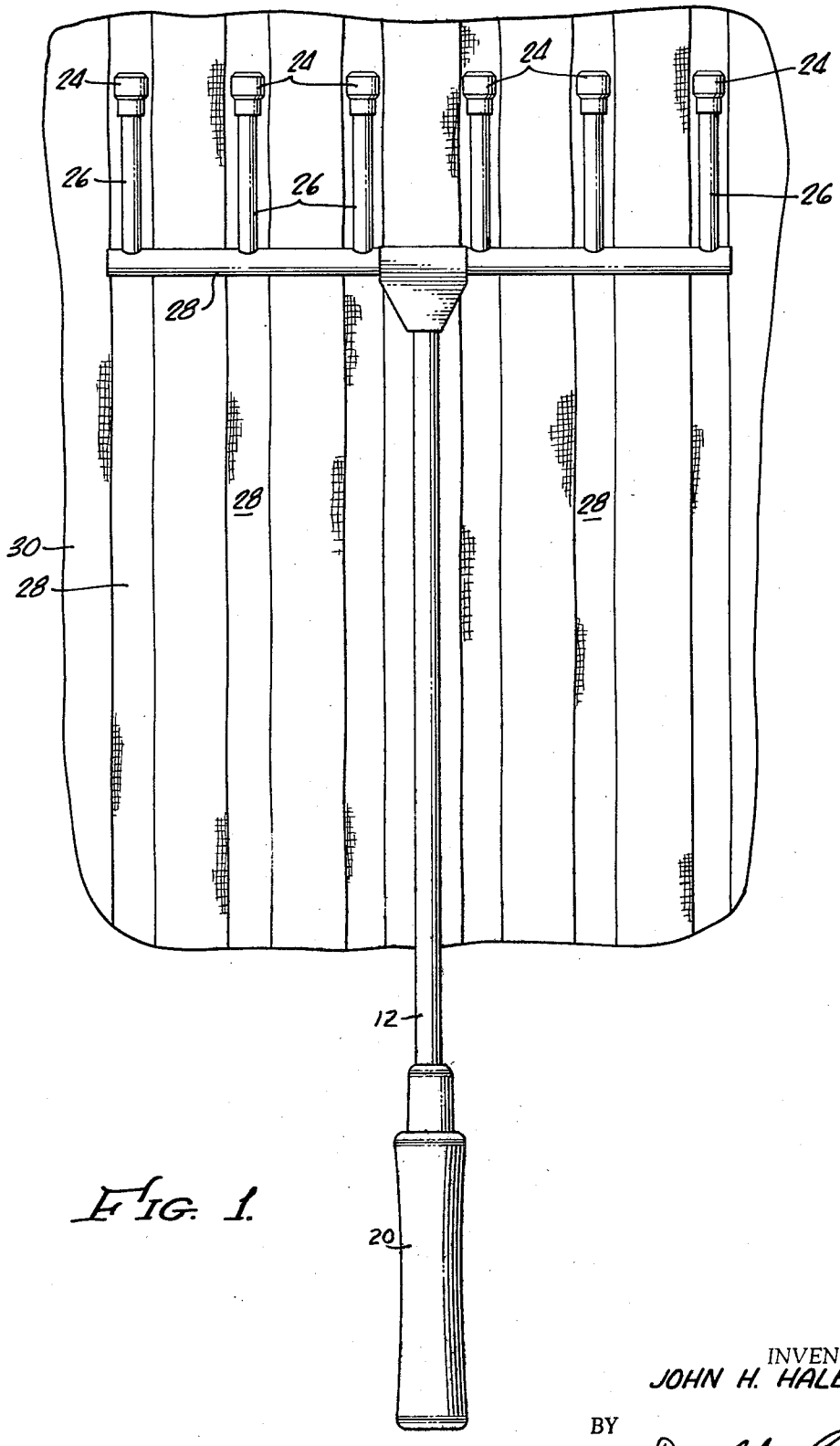


FIG. 1.

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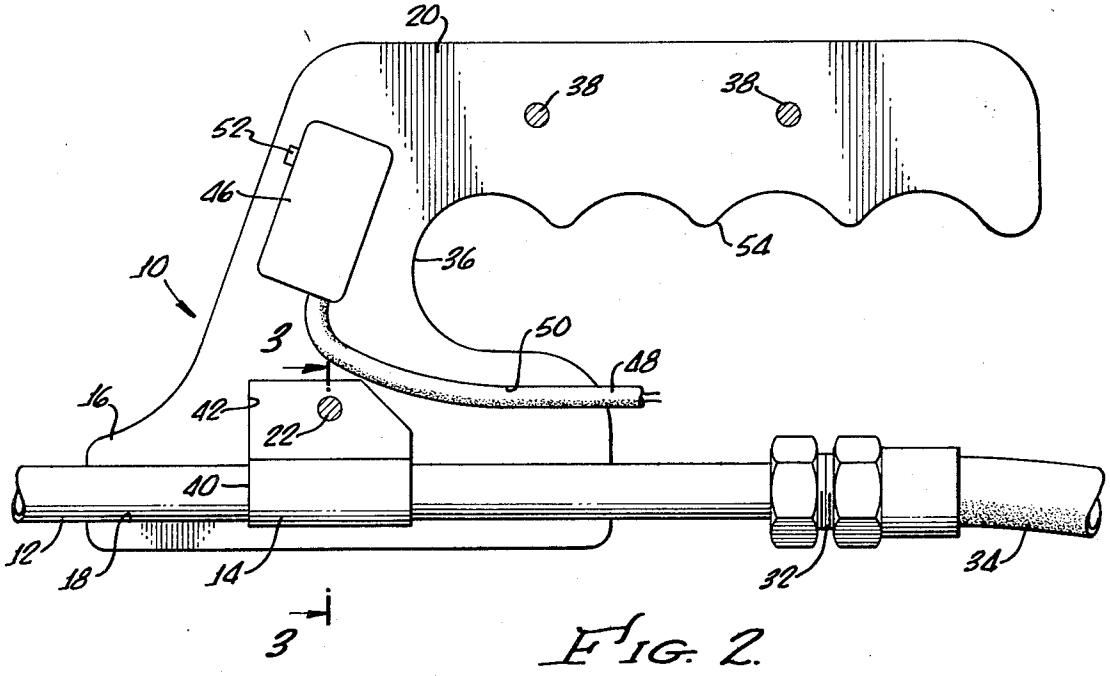


FIG. 2.

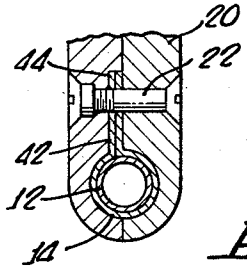


FIG. 3.

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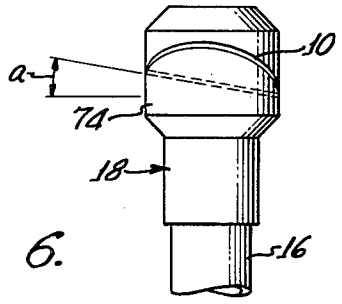


FIG. 6.

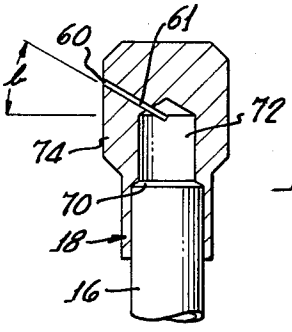


FIG. 5.

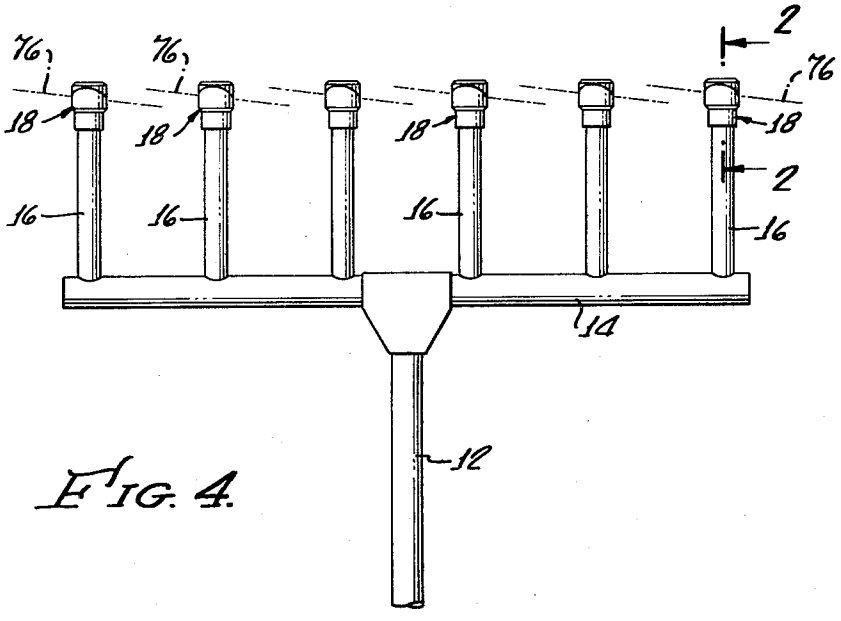


FIG. 4.

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MANUAL STEAMING APPARATUS

This application is a continuation-in-part application of my application Ser. No. 765,308, filed Oct. 7, 1968 and now abandoned.

FIELD OF THE INVENTION

My present invention relates to a manual steaming apparatus, and more particularly to steam spraying apparatus for applying steam to a fabric, e.g. a drapery or the like, during the forming and stretching of a drapery subsequent to dry cleaning.

BACKGROUND AND OBJECTS OF THE INVENTION

Manual steaming apparatus such as the steam wands heretofore known, have been awkward to manipulate because the handle portion gripped by the operator, directly encompasses the steam delivery tube and as a result of heat transfer the handle becomes too hot for the operator to hold for a prolonged time. Also, because of the heating and cooling of the steam delivery tube, the handle portion tends to become loose and slide axially along the steam delivery tube.

Accordingly, an object of my present invention is to provide an improved steam wand with a portion of the handle firmly attached to the steam delivery tube.

Another object of my present invention is to provide a steam wand with a handle of a high heat insulating material which is affixed to the steam delivery tube of the wand by means offset from the handle.

It is also an object of my present invention to provide a steam wand with a handle attached to the steam delivery tube in such a manner as to provide balance in the hand of the operator.

In the dry cleaning art it is sometimes desirable to apply steam to fabrics, e.g. draperies and the like, by spraying with a plurality of steam spray jets to cover a broad area. The steam spraying apparatus, sometimes called a steam wand, as heretofore known, consists of a plurality of nozzles which contain baffles against which the steam is sprayed prior to delivery to the fabric. The use of baffles, however, to disperse the steam results in condensation of the steam and only limited penetration of the steam into the fabric.

Therefore, it is a further object of my present invention to provide a type of steam spray nozzle which gives greater penetration of steam into the fabric by application of the steam directly to the fabric.

Each of the plurality of spaced apart jet nozzles in the spray wands, of the prior art, provide a spray which tends to intersect the spray from adjacent nozzles and cause formation of liquid, e.g. condensate, between spray nozzles, resulting in an non-uniform distribution of spray across the area covered by the spray wand.

Accordingly, it is a further object of my present invention to provide a steam nozzle whose spray does not intersect the spray from adjacent nozzles.

It is a further object of my present invention to provide a steam wand having a plurality of spray nozzles arranged to give a spray pattern with uniform distribution of steam across the width of the spray.

In order to prevent overspray or underspray, spray wands should have the nozzle orifices of the spray pipes, arranged to direct the fluid sprayed against the article being sprayed, in each of the several positions at which the operator normally holds the wand during use.

It is therefore a further object of my present invention to provide a spray nozzle orifice designed to direct spray from a vertically or horizontally positioned spray wand against a vertically positioned article.

Other objects a more complete understanding of my present invention may be had by reference to the following specification when taken in conjunction with the appended claims and the accompanying drawings, wherein

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a steam wand in position to apply steam to the folds of a vertically supported drapery;

FIG. 2 shows an enlarged side view, partially in section, of the handle of the steam wand of FIG. 1; and

FIG. 3 is a cross sectional view taken on line 3—3 of FIG. 2, showing the metal strap connector within the tube handle.

FIG. 4 shows a steam wand employing nozzles designed according to my present invention,

FIG. 5 is an enlarged cross sectional view taken on line 2—2 of FIG. 4 showing the spray nozzle tip, and

FIG. 6 is an enlarged view of one of the spray nozzles shown in FIGS. 1 and 4.

SUMMARY OF THE INVENTION

With reference to FIG. 2, the steam wand of my present invention is provided with a novel handle **10** which is attached to the delivery tube **12** firmly by means of a sweat strap **14**, embedded in that portion of the handle which encompasses the tube **12**. The handle **10** comprises a body portion **16** with a longitudinal opening **18** through which the steam delivery tube **12** extends. The housing **16** is attached to a handle grip **20** which is disposed approximately parallel to the steam delivery tube **12** and of a size and length to provide better balance and consequent ease of operation. Axial movement of the steam delivery tube **12** through the handle housing **16** is provided by sweat strap **14** (FIG. 3) which is firmly fitted to the steam delivery tube **12** and attached by a screw or pin **22** to the handle.

The steam wand employs spray nozzles which have direct jet openings **60** and which are angled slightly as best illustrated in FIG. **6** as angle *a*, to give a spray pattern wherein the spray from each nozzle (as shown in phantom line) does not intersect spray from adjacent nozzles, thus giving a wider spray pattern and more uniform distribution of steam which results in better penetration of the steam into the fabric and less condensation. Wasteful spray of steam overhead when the pipe **26** is vertical and spray of steam on the floor when the pipe is held horizontally, is prevented by directing the orifice **61** at an angle *b* (FIG. **5**).

DETAILED DESCRIPTION OF THE DRAWINGS

FIG. **1** shows the steam delivery apparatus of a steam wand. A plurality of jet nozzles **24** are arranged on tubes **26** in a fingerlike pattern and attached to a manifold tube **28**. The jet tubes **26** are spaced apart to permit insertion into folds **29** of a drapery **30**. The manifold tube **28** is connected to steam delivery tube **12** and this steam delivery apparatus is attached by a suitable connector **32** to a steam supple hose **34**, as shown in FIG. **2**. When the steam wand is used with a drapery as shown in FIG. **1**, the drapery is preferably mounted on a pleating and stretching machine, for example, of the type shown in my U.S. Pat. No. 3,506,169 issued Apr. 14, 1970.

The drapery as shown in FIG. **1** is put under tension and steamed lightly to remove wrinkles and assist in forming. If extensive stretching of the drapery is necessary to compensate for the shrinkage during dry cleaning, additional steam is applied to the drapery through the steam delivery apparatus, with the steam jets inserted in the folds and the wand combed vertically in the drapery folds until the application of steam relaxes the fabric and causes the drapery to hang limp on the drapery pleating and stretching machine. The drapery may then by stretched to the desired length by adding tension to the drapery by appropriate manipulation of the aforementioned machine.

The steam wand must be easily manipulated manually and such manipulation is greatly facilitated by a wand which is balanced at the handle portion **20**. The steam handle **10** is placed on the steam delivery apparatus by insertion of tube **12** in such a position as to facilitate the desired balance of the steam wand in the hand of the operator. The housing **16** has a

cylindrical opening **18** therein shaped to receive the steam delivery tube **12**.

The handle may conveniently be fabricated in two vertically split half sections, which are then fastened together by pins or screws **38** and **22**. One half of the handle may be milled out for convenience, in the area of the sweat strap, to receive the sweat strap.

The sweat strap **14**, as best shown in FIG. **3**, is firmly applied to the tube **12** by conventional "sweating", e.g. by wrapping the strap **14** in a heated condition, around the steam delivery tube **12** so that as it cools and shrinks, the strap will firmly grip the steam delivery tube **12**. The strap has a retaining portion **42** which extends upwardly above the tube into the housing **16** and is secured in the housing with a screw **22** which passes through a hole **44** in the upper end of the strap.

THe handle portion may be formed with an internal cavity **46** therein for receiving a steam control switch which may be electrically attached to the steam valve actuator (not shown) by the electrical wire **48** through a channel **50** provided in the handle. The switch may be placed in the handle and its control button made accessible to the operator, through knockout portion **52**. Portion **52** is of reduced thickness and may be prestamped for easy removal.

The handle **10**, which is made of a material of low thermal conductivity, such as wood or a molded plastic, comprises a housing portion **16** with a handle grip **20** attached thereto through a neck portion **36**. The handle grip portion **12** may be provided with a pistol grip **54** for convenience in handling by the operator.

With reference to FIG. **4**, each of the pipes **26** is provided at its outer end with a nozzle **24** which is shown in enlarged view in FIG. **6**. The nozzle is inserted on the end of the pipe **26** as shown in the cross sectional view, FIG. **5**, with the upper end of the pipe **26** engaging the internal shoulder portion **70** to fix the position of the nozzle on the pipe **26**. A cavity **72** in the nozzle provides communication from the pipe **26** to the orifice **60**, which, as shown in FIG. **5**, is cut in the form of a slot in the side **74** of the nozzle. Hence, steam exiting the tube **26** through the cavity **72** and slot-like orifice **60** sprays directly on the fabric or other article being sprayed. THe nozzles **76** are positioned on their respective pipe ends with the orifices facing the same direction as shown in FIG. **4**. The orifices may be retained on the pipe ends by any convenient means, e.g. soldering, threading, crimping, etc.

Referring now to FIG. **6**, the orifice **60** is cut as with a radial saw, in the side of the nozzle **74** at a slight angle *a* from the horizontal. This angle *a* is preferably between 70° and 20° from the horizontal with an angle of about 10°–20° being preferable. The slot-like orifice is cut sufficiently deep in the side of the nozzle to intersect the cavity **72**, so as to provide an exit path for the pressurized fluid in the nozzle pipe **26**.

The slot-like shape of the orifices **60** causes the spray to issue from the nozzles **24** in a substantially flat or plane pattern. The slight incline of the orifice slot to the horizontal results in the issuance of a spray which is also inclined to the horizontal so that the plurality of nozzles mounted on spaced apart pipe, as shown in FIG. **4**, results in a multiplicity of spray patterns **76** from the several nozzles **24**, which do not intersect patterns from adjacent nozzles to thus prevent formation of condensation zones at intersecting spray patterns. As a result of the elimination of such condensation zones, a more efficient and uniform distribution of steam spray may be effected.

The orifice slot **61** is inclined as shown in cross sectional view, FIG. **5**, at an angle *b* of about 20° to 60° to prevent spraying vertically up into the air when the wand is held in a vertical position (as when *b*=90°) or downwardly on the floor when the wand is held in a horizontal position as when *b* = 0°). Although *b* may be in the range of from about 20° to 60°, it is preferably about 30°.

Thus it may be seen that my present invention provides an improved steam wand with a balanced handle **10** which is firmly attached to the steam delivery tube **12** with a novel sweat strap arrangement, and nozzles with a novel orifice configuration which spray directly on the fabric in non-intersecting spray pattern.

While my present invention has been described above with reference to a specific embodiment thereof, it is to be understood that various changes may be made in the apparatus without departing from the scope of my invention and the scope of my invention should not be limited to the specific embodiments as set forth above, but should be afforded the full breadth of the appended claims.

I claim:

1. Steam spraying apparatus for applying steam from a steam supply hose to a fabric, comprising:

a steam delivery apparatus including a plurality of spray tubes having nozzles thereon, a steam delivery tube, and tubular means for holding said spray tubes and conveying steam from said delivery tube through said spray tubes to said nozzles;

handle means for manipulating said steam delivery apparatus comprising a delivery tube housing adapted to encompass and firmly engage said delivery tube, and

handle grip means connected to said housing and spaced apart from said delivery tube, for manually manipulating said steam delivery apparatus.

2. The apparatus of claim **1** including a retainer strap associated with said housing and sweat fitted onto said delivery tube for preventing movement of said handle means on said delivery tube.

3. The apparatus of claim **2** including means for affixing said strap to said housing.

4. The apparatus of claim **1** including a nozzle configuration wherein each of the nozzles has a slot cut therein to communicate with said tubular means, said slots being cut in the sides of said nozzle tips at an angle inclined from the horizontal whereby each tip provides a substantially flat spray pattern which does not intersect the spray pattern from adjacent nozzles.

5. The apparatus of claim **1** wherein each nozzle has a cavity therein in fluid communication with said tube, and a slot is cut in the side of said nozzles to intersect said cavity, said slots being cut at an angle inclined from the horizontal.

6. The apparatus of claim **5** wherein said slots are cut at an angle of from about 7° to 20° from the horizontal, when viewing said nozzle from said fabric.

7. The apparatus of claim **6** wherein said angle is from about 10° to 12°.

8. The apparatus of claim **5** wherein said orifice slot is cut at an angle of from about 20° to 60° from the horizontal when viewing said nozzle normal to the direction of spray through said orifice slot.

9. The apparatus of claim **8**. wherein said angle is about 30°.

10. In a steam spraying apparatus for applying steam from a supply hose to the fabric with a steam delivery apparatus which includes a plurality of spray nozzles, a steam delivery tube, and tubular means for holding said nozzles in spaced relationship and conveying steam from said delivery tube to said nozzles, the improvement comprising in combination:

a handle means for manipulation said steam delivery apparatus including a steam delivery tube housing adapted to encompass and firmly engage said delivery tube,

handle grip means connected to said housing and spaced therefrom through a neck portion, and

means within said housing for gripping and firmly engaging said steam delivery tube therein.

11. The apparatus of claim **10**, wherein said handle means are formed in two halves which are fastened together and wherein the handle halves are milled out to receive said gripping means.

12. The apparatus of claim **11**, including switch means for controlling the steam delivery, and a milled section in said handle for receiving said switch means.

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