US 20080197029A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2008/0197029 A1**

(43) **Pub. Date: Aug. 21, 2008**

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(54) **PAINT SPRAYER TIP STORAGE DEVICE AND METHOD**

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(21) Appl. No.: **11/963,334**

(22) Filed: **Dec. 21, 2007**

**Related U.S. Application Data**

(60) Provisional application No. 60/871,418, filed on Dec. 21, 2006.

**Publication Classification**

(51) **Int. Cl.**

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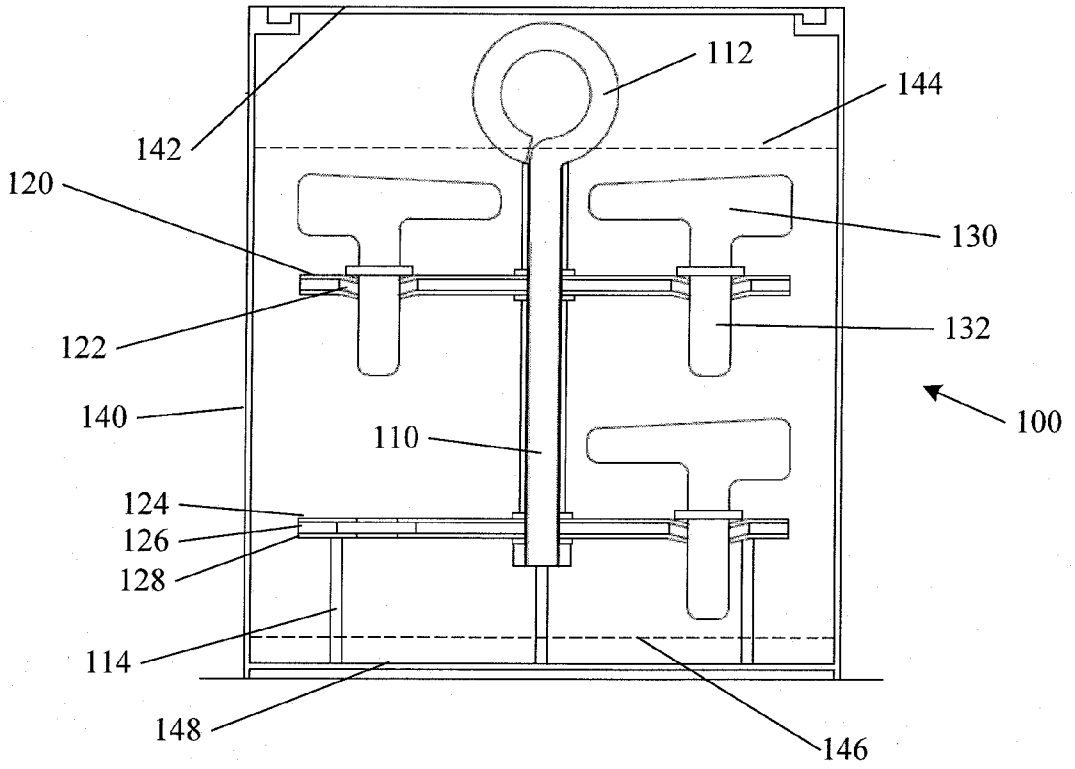
|---|---|
| ***B65D 81/24*** | (2006.01) |
| ***B65D 85/00*** | (2006.01) |
| ***B65B 55/22*** | (2006.01) |
| ***A47F 7/00*** | (2006.01) |

(52) **U.S. Cl.** ..... **206/207**; 206/349; 211/13.1; 53/431

(57) **ABSTRACT**

Devices and methods for storing spray nozzle tips are shown. Using devices and methods disclosed, a user can store and later find any one of several nozzle tips from within a solvent reservoir. Devices and methods shown allow a user to store and retrieve nozzle tips without immersing fingers or hands in solvent, which can be harsh and/or damaging to skin. Selected embodiment further allow the solvent reservoir to be tipped over or otherwise jostled without the stored nozzle tips becoming dislodged from their organized locations.



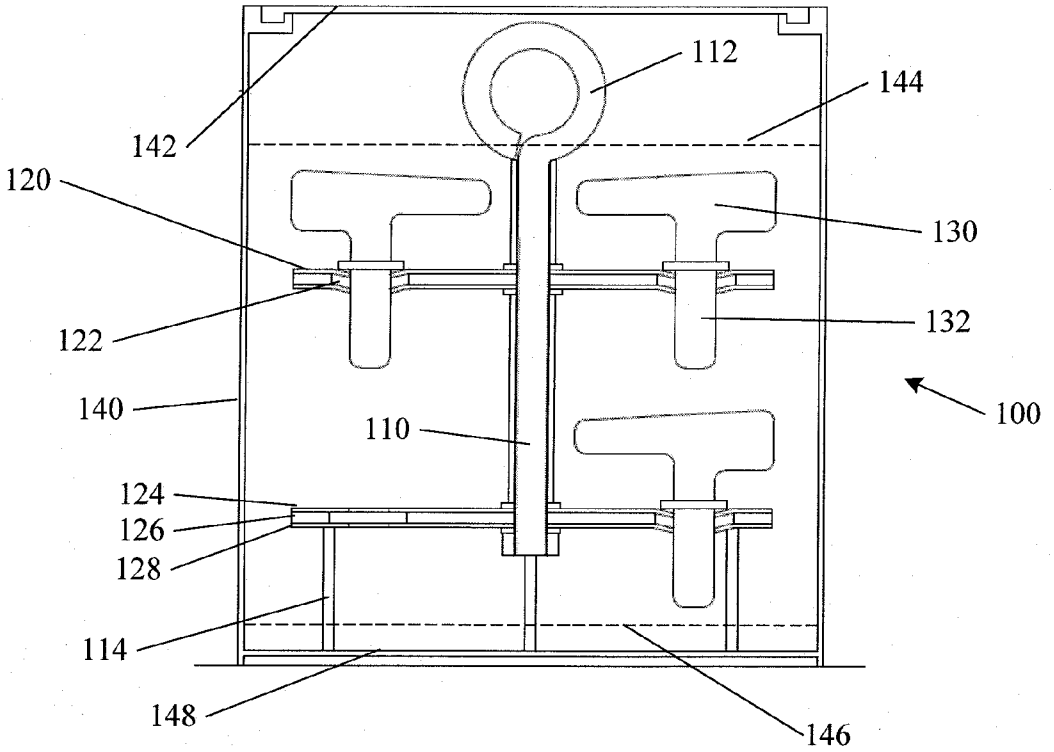

112
144
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Fig. 1A

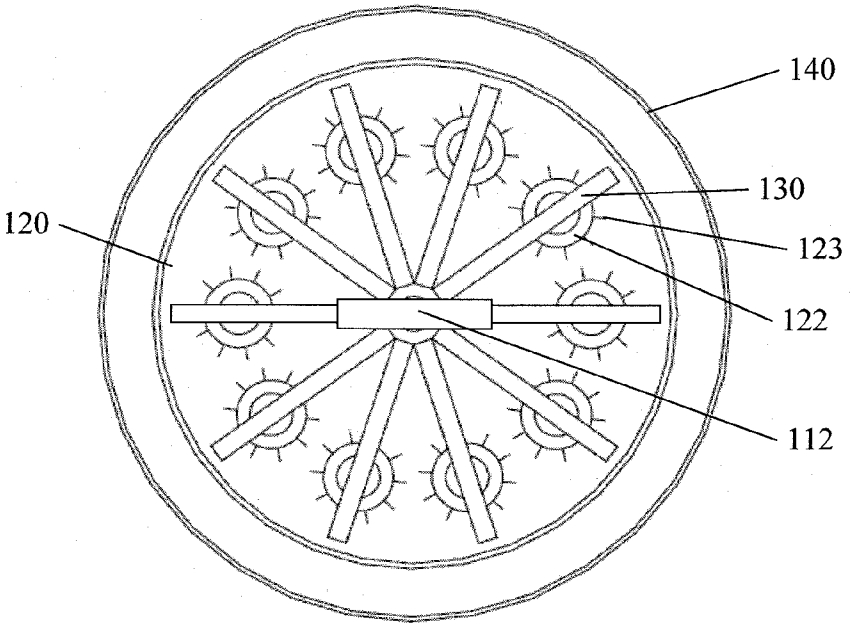
140
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Fig. 1B

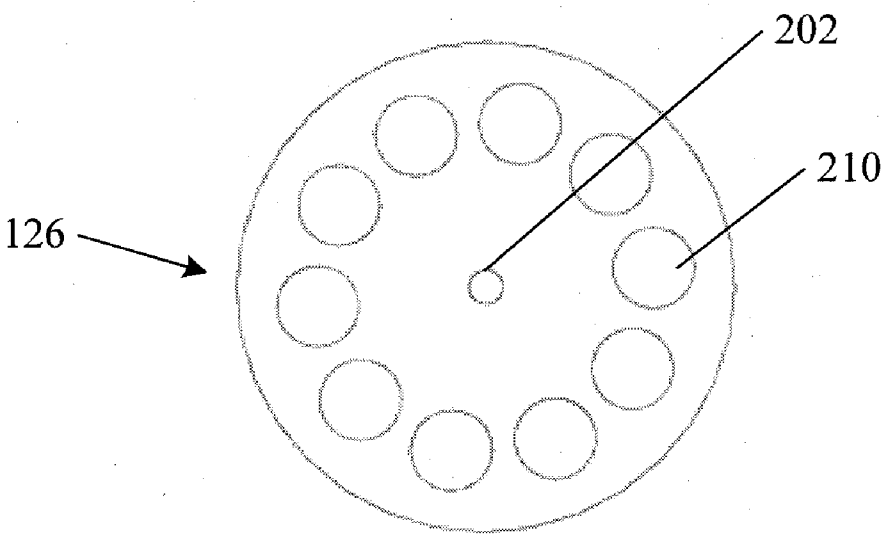


Fig. 2A

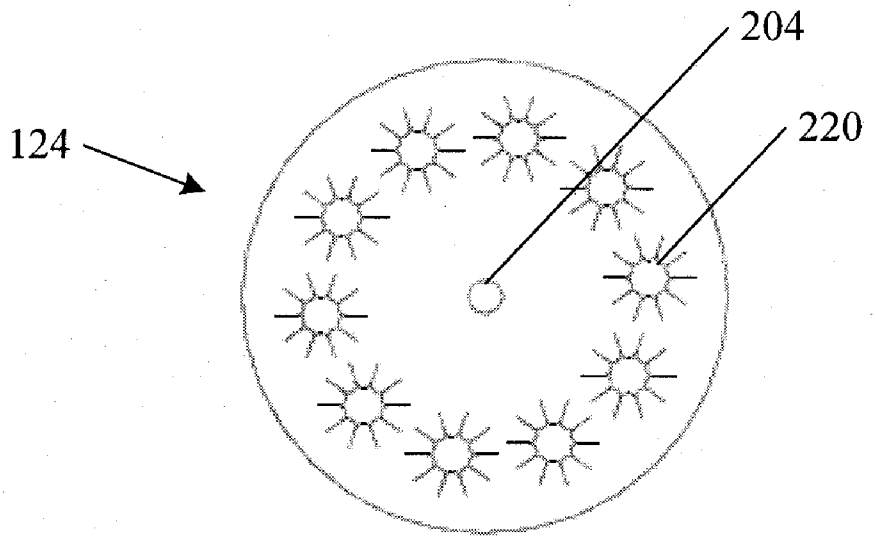


Fig. 2B

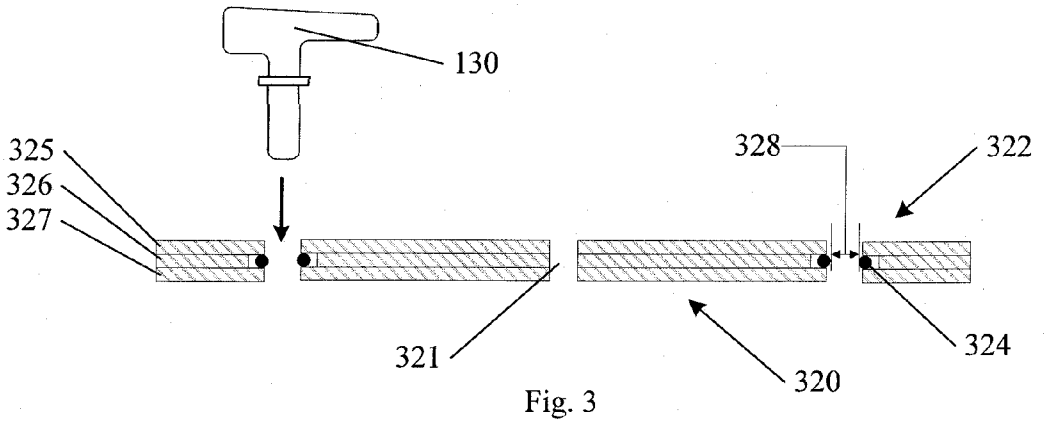
130
325
326
327
328
322
321
320
324

Fig. 3

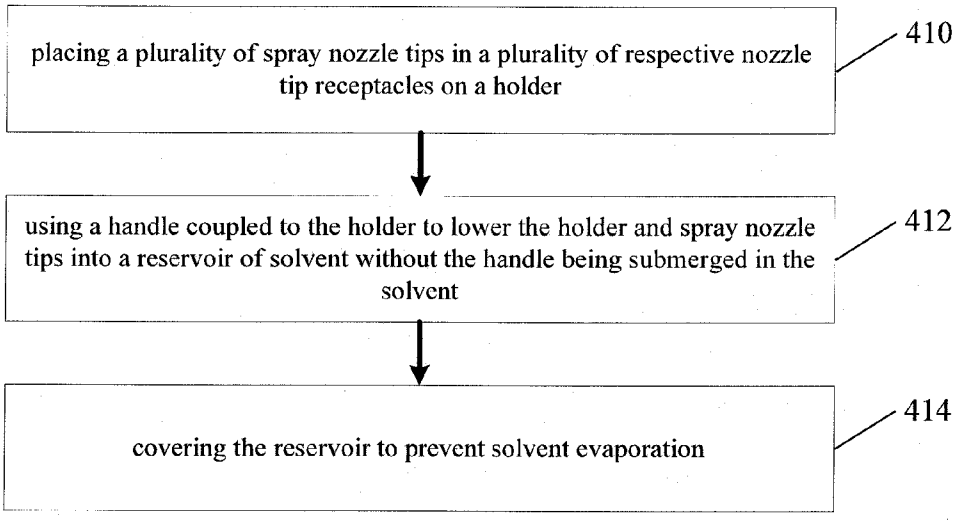
placing a plurality of spray nozzle tips in a plurality of respective nozzle tip receptacles on a holder
410
using a handle coupled to the holder to lower the holder and spray nozzle tips into a reservoir of solvent without the handle being submerged in the solvent
412
covering the reservoir to prevent solvent evaporation
414

Fig. 4

# PAINT SPRAYER TIP STORAGE DEVICE AND METHOD

## CROSS REFERENCE TO RELATED APPLICATIONS

**[0001]** This application claims the benefit of priority of U.S. Provisional Application Ser. No. 60/871,418 filed Dec. 21, 2006. The entire contents of which are incorporated herein by reference.

## TECHNICAL FIELD

**[0002]** This invention relates to devices and methods for use with spray tips. Specifically, this invention relates to paint spray tips and devices and methods of storage.

## BACKGROUND

**[0003]** Spray painting devices use a nozzle to refine the paint into multiple droplets for application to a surface. In many commercial spray painting applications the nozzles are removable from a spray painting system. Removable nozzle tips provide ease of cleaning, and provide the ability to change nozzle tips for different paint types, or desired spray finishes, etc. One common type of nozzle tip includes a reversible nozzle tip for high pressure airless spray systems.

**[0004]** Commercial painters typically have several nozzle tips for various paint types, finishes, etc. It is desirable to keep multiple spray tips organized to facilitate easy location of a desired nozzle tip. It is further desirable to ensure that the tips are kept clean to provide proper spray operation.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0005]** FIG. **1**A shows a side view of a paint spray nozzle tip storage system according to an embodiment of the invention.

**[0006]** FIG. **1**B shows a top view of the paint spray nozzle tip storage system from FIG. **1**A.

**[0007]** FIG. **2**A shows a top view of a component of a paint spray nozzle tip storage device according to an embodiment of the invention.

**[0008]** FIG. **2**B shows a top view of another component of a paint spray nozzle tip storage device according to an embodiment of the invention.

**[0009]** FIG. **3** shows a cross section view of selected components of a paint spray nozzle tip storage device according to an embodiment of the invention.

**[0010]** FIG. **4** shows a flow diagram of a method according to an embodiment of the invention.

## DETAILED DESCRIPTION

**[0011]** In the following detailed description, reference is made to the accompanying drawings which form a part hereof, and in which is shown, by way of illustration, specific embodiments in which the invention may be practiced. In the drawings, like numerals describe substantially similar components throughout the several views. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention. Other embodiments may be utilized and structural, or logical changes, etc. may be made without departing from the scope of the present invention.

**[0012]** FIG. **1**A illustrates spray nozzle tip storage system **100** according to one embodiment. The system **100** includes a base unit **110** with a handle **112** coupled to an end. A holder **120** is shown coupled to the base unit **110**. The holder includes a number of nozzle tip receptacles **122**. In the example shown, the receptacles **122** are a number of holes that accept nozzle tips **130**. FIG. **1** shows an end portion **132** of a nozzle tip **130** inserted within a receptacle **122**. Other examples of receptacles include slots, toggle clamps, pins, etc. or other devices capable of receiving a nozzle tip **130**.

**[0013]** In the example shown, the base unit **110** and holder **120** are formed from a material that is compatible with a paint solvent. Examples of compatible materials include selected plastics, metals, glass, etc. As will be discussed in more detail below, storage of spray nozzle tips in solvent keeps the tips in a condition ready for use at all times. Because the nozzle tips **130** are immersed in solvent, the holder **120** and other components of the storage system **100** need to be compatible with the solvent. In selected examples, the material used is transparent or translucent to help see and select an appropriate nozzle tip. Examples of solvent include, but are not limited to paint thinner, mineral spirits, lacquer thinner, etc.

**[0014]** In FIG. **1**A, the holder **120** is shown as a flat plate. As shown in FIG. **1**B, the flat plat is disk shaped in the example shown. Although plate configurations and disk shapes are illustrated, the invention is not so limited. One of ordinary skill in the art having the benefit of the present disclosure will recognize that other holder structures such as rectangular plates, or complex solid forms other than plates are also within the scope of the invention.

**[0015]** FIG. **1**A also illustrates two holders **120** stacked over one another. Multiple plates provides the ability to store and organize more nozzle tips. Although two holders **120** are shown in FIG. **1**A, other numbers of holders such as one holder, or more than two holders are within the scope of the invention.

**[0016]** The spray nozzle tip storage system **100** further includes a solvent reservoir **140**, including a lid **142** that prevents evaporation of solvent when the nozzle tips **130** are in storage. FIG. **1**A illustrates a level of solvent **144** that covers the nozzle tips **130**, yet leaves the handle **112** exposed above the surface of the solvent **144**. In one embodiment, the solvent reservoir **140** includes a glass jar. In one embodiment, the solvent reservoir **140** includes a box shape, or other reservoir shape. In one embodiment, the solvent reservoir **140** includes a steel paint can. Paint cans are readily available to commercial painters and provide a familiar storage system.

**[0017]** In one embodiment a number of legs **114** are attached to a holder **120**, base unit **110**, or other component of the storage system **100**. Legs provide a spacing that holds the nozzle tips **130** above a bottom **148** of the solvent reservoir **140**. Occasionally, sludge from old paint, etc. may build up at the bottom of the solvent reservoir. A sludge level is indicated in FIG. **1**A by dotted line **146**. One feature of the legs **114** is to hold the nozzle tips **130** out of the sludge **146**.

**[0018]** In one embodiment, the legs **114** include a magnetic end. When magnetic legs **114** are used with a ferromagnetic solvent reservoir such as a steel paint can, the holder **120**, base unit **110** and handle **112** are held in place. Such a configuration is useful in the event that the solvent reservoir **140** is tipped over, or jostled about during transportation. In one embodiment, the nozzle tip receptacles **122** are further equipped with securing devices to hold the nozzle tips **130** in place within the nozzle tip receptacles **122**. In the event that the solvent reservoir **140** is tipped over or jostled, the securing devices keep the nozzle tips **130** from falling out of place and becoming disorganized.

**[0019]** One example of a securing device is shown in FIGS. **1**A and **1**B as a starburst pattern cut into a resilient material such as a polymer gasket. FIG. **1**B shows a number of slits **123** in a resilient material for each nozzle tip receptacle **122**. Although a starburst pattern is shown for use as a securing device, the invention is not so limited. Other configurations of securing devices including those discussed below regarding FIG. **3** are also within the scope of the invention.

**[0020]** In one embodiment, a laminate structure is used to form the securing devices. FIG. **1**A illustrates a first resilient material layer **124**, a rigid layer **126**, and a second resilient layer **128**. In one embodiment, the first and second resilient layers **124**, **128** are formed from a polymer gasket material. Other resilient materials such as rubbers, or plastics, etc. that are compatible with paint thinner, lacquer thinner, or other solvents are also within the scope of the invention.

**[0021]** FIGS. **2**A and **2**B illustrate possible configurations of rigid layer **126** and first resilient layer **124**. In one embodiment, the first resilient layer **124** and the second resilient layer **128** are substantially identical. FIG. **2**A shows a number of holes **210** that serve as nozzle tip receptacles. A center hole **202** is shown as option for attachment to a base unit. FIG. **2**B shows a starburst pattern **220** that serves as a securing device to hold nozzle tips in place within the holes **210**. A center hole **204** is further shown as an option for attachment to the base unit.

**[0022]** FIG. **3** shows another configuration of a holder **320** that may be used in a manner similar to embodiments described above. A center hole **321** is shown as an option for attachment to a base unit as in other embodiments. A nozzle receptacle **322** is shown to accept a nozzle tip **130** as illustrated. FIG. **3** shows an o-ring **324** or similar resilient component inserted within the nozzle receptacle **322**. In one embodiment, the o-ring **324** is held captive within a number of laminated layers **325**, **326**, **327** that form the holder **320**. An inner diameter **328** of the o-ring **324** as shown forms an interference fit with the nozzle tip **130**.

**[0023]** Although starburst patterns and grommets are discussed in detail, the invention is not so limited. Other securing device configurations such as alternative slit patterns, resilient grommets, mechanical holders, etc. are within the scope of the invention.

**[0024]** FIG. **4** shows a flow diagram of an example method of use. In operation **410**, a user places one or more spray nozzles tips in respective nozzle tip receptacles such as those described in embodiments above. In operation **412**, the user then lowers the nozzle tips into a reservoir of solvent using a handle that is coupled to a holder similar to embodiments described above and covers the reservoir in operation **414** to prevent solvent evaporation. The handle is not submerged within the solvent, thus allowing the user to later remove the nozzle tips without getting his or her hands wet. Previous systems required a user to fish for a desired nozzle tip within solvent, or to dump everything out and start again with new solvent.

**[0025]** Using devices and methods described in the present disclosure, a user can easily store and later find any one of several nozzle tips from within a solvent reservoir. Devices and methods shown allow a user to store and retrieve nozzle tips without immersing fingers or hands in solvent, which can be harsh and/or damaging to skin. Selected embodiment further allow the solvent reservoir to be tipped over or otherwise jostled without the stored nozzle tips becoming dislodged from their organized locations.

**[0026]** While a number of advantages of embodiments of the invention are described, the above lists are not intended to be exhaustive. Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement which is calculated to achieve the same purpose may be substituted for the specific embodiment shown. This application is intended to cover any adaptations or variations of the present invention. It is to be understood that the above description is intended to be illustrative, and not restrictive. Combinations of the above embodiments, and other embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention includes any other applications in which the above structures and methods are used. The scope of the invention should be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled.

I claim:

**1**. A paint spray nozzle tip storage device, comprising:

a base unit with a handle;

a holder coupled to the base unit, including a number of nozzle tip receptacles, formed from a solvent compatible material;

wherein the holder is configured to fit within a solvent reservoir with the handle protruding above a solvent surface.

**2**. The paint spray nozzle tip storage device of claim **1**, wherein the number of nozzle tip receptacles include a securing device to retain nozzle tips in multiple orientations.

**3**. The paint spray nozzle tip storage device of claim **1**, wherein the holder includes a flat plate, and wherein the number of nozzle tip receptacles includes a number of holes cut into the flat plate.

**4**. The paint spray nozzle tip storage device of claim **3**, wherein the flat plate includes a flat disk, and the number of nozzle tip receptacles include a securing device to retain nozzle tips in multiple orientations.

**5**. The paint spray nozzle tip storage device of claim **4**, wherein the securing device includes a starburst pattern cut into an undersized hole from a deformable material.

**6**. The paint spray nozzle tip storage device of claim **4**, wherein the securing device includes a deformable o-ring that forms an interference fit with a nozzle tip, and engages the flat disk.

**7**. The paint spray nozzle tip storage device of claim **2**, further including a number of magnetic legs to hold the storage device in place and space the holder away from a bottom of the solvent reservoir.

**8**. A paint spray nozzle tip storage system, comprising:

a steel can and cover to hold a volume of solvent;

a base unit with a handle;

at least one flat disk coupled to the base unit, including a number of nozzle tip receptacles, formed from a solvent compatible material;

wherein flat disk has a diameter small enough to fit within the steel can, and the handle is sized to fit within the can when the cover is on, with the handle protruding above a solvent surface.

**9**. The paint spray nozzle tip storage system of claim **8**, further including a number of magnetic legs to hold the base unit in place and space the flat disk away from a bottom of the steel can.

**10**. The paint spray nozzle tip storage system of claim **9**, wherein the number of nozzle tip receptacles include a securing device to retain nozzle tips in multiple orientations.

**11**. The paint spray nozzle tip storage system of claim **10**, wherein multiple flat disks are coupled to the base unit above one another, each flat disk including a number of nozzle tip receptacles.

**12**. A method of storing spray nozzle tips, comprising:

placing a plurality of spray nozzle tips in a plurality of respective nozzle tip receptacles on a holder;

using a handle coupled to the holder to lower the holder and spray nozzle tips into a reservoir of solvent without the handle being submerged in the solvent; and

covering the reservoir to prevent solvent evaporation.

**13**. The method of claim **12**, wherein placing a plurality of spray nozzle tips in a plurality of respective nozzle tip receptacles includes securing the plurality of spray nozzle tips to the holder to prevent them from falling out of place if the reservoir is tipped over.

**14**. The method of claim **12**, wherein using a handle coupled to the holder to lower the holder and spray nozzle tips into a reservoir of solvent includes lowering the holder and spray nozzle tips into a steel paint can.

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