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(54) **PAINT CUP FOR PAINT SPRAYER**

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(57) **ABSTRACT**

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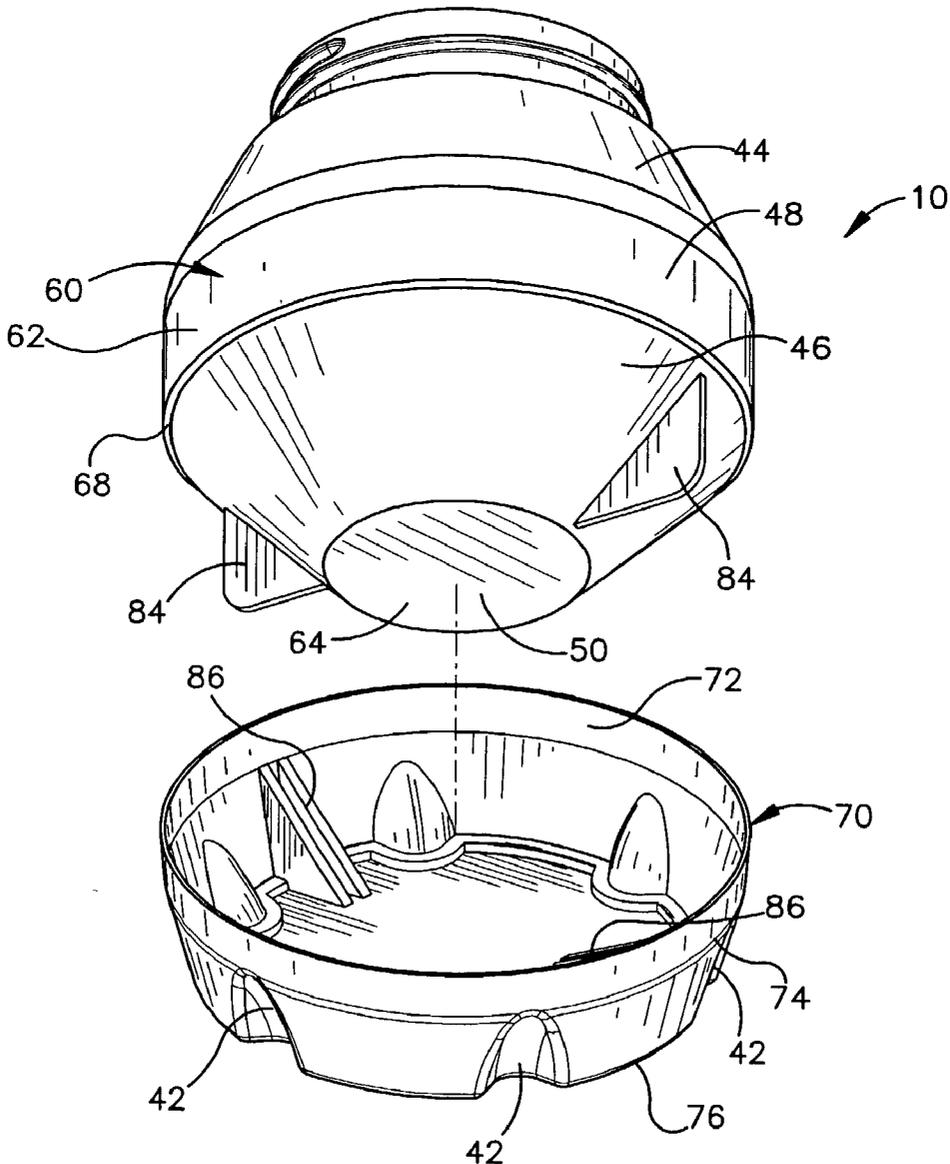
A paint cup has a base wall, a side wall, and a plurality of indentations positioned around the lower end of the side wall. The side wall extends upwardly from the base wall and has an upper end and a lower end. The indentations extend from an intermediate point between the upper and lower ends of the side wall to and through the base wall. Each indentation has a length, a cross-section, and a profile and at least one of the cross-section and profile varies along the length. The paint cup may be formed in two parts, with the upper part being the body member and the lower part being the base member. In addition, the paint cup can have an upper frustoconical part, a middle cylindrical part, and a lower frustoconical part.

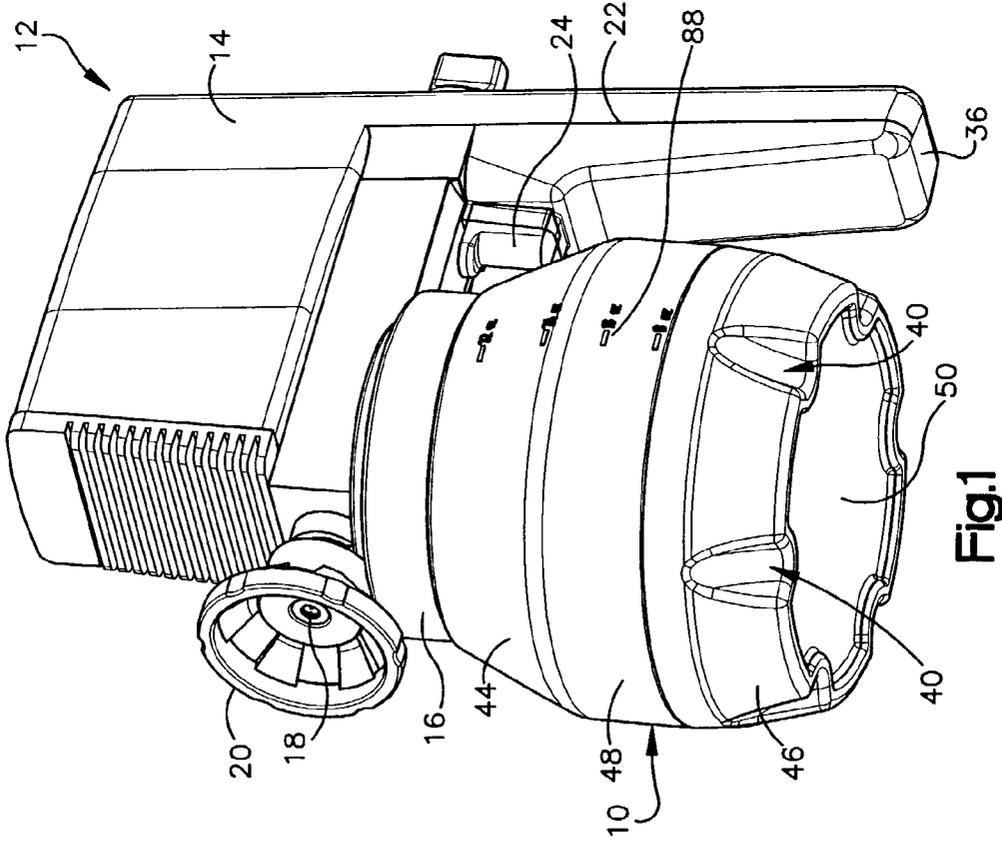
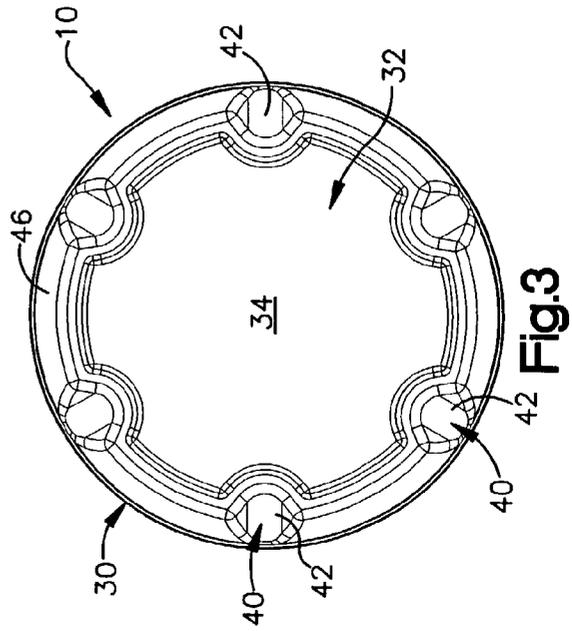
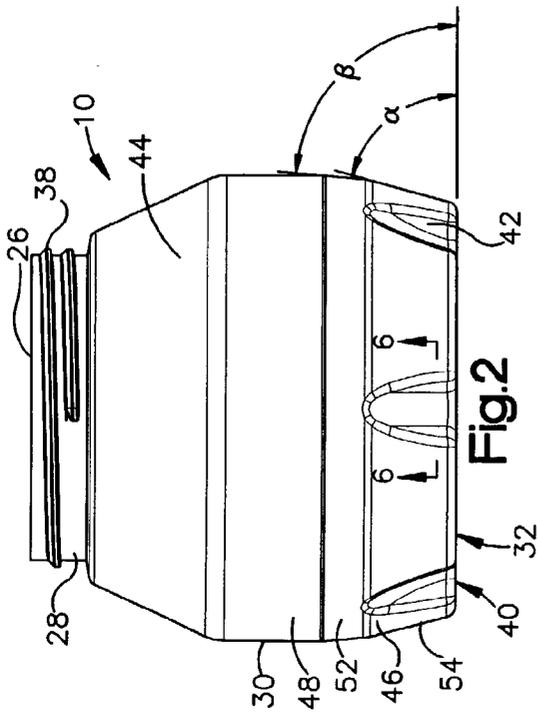
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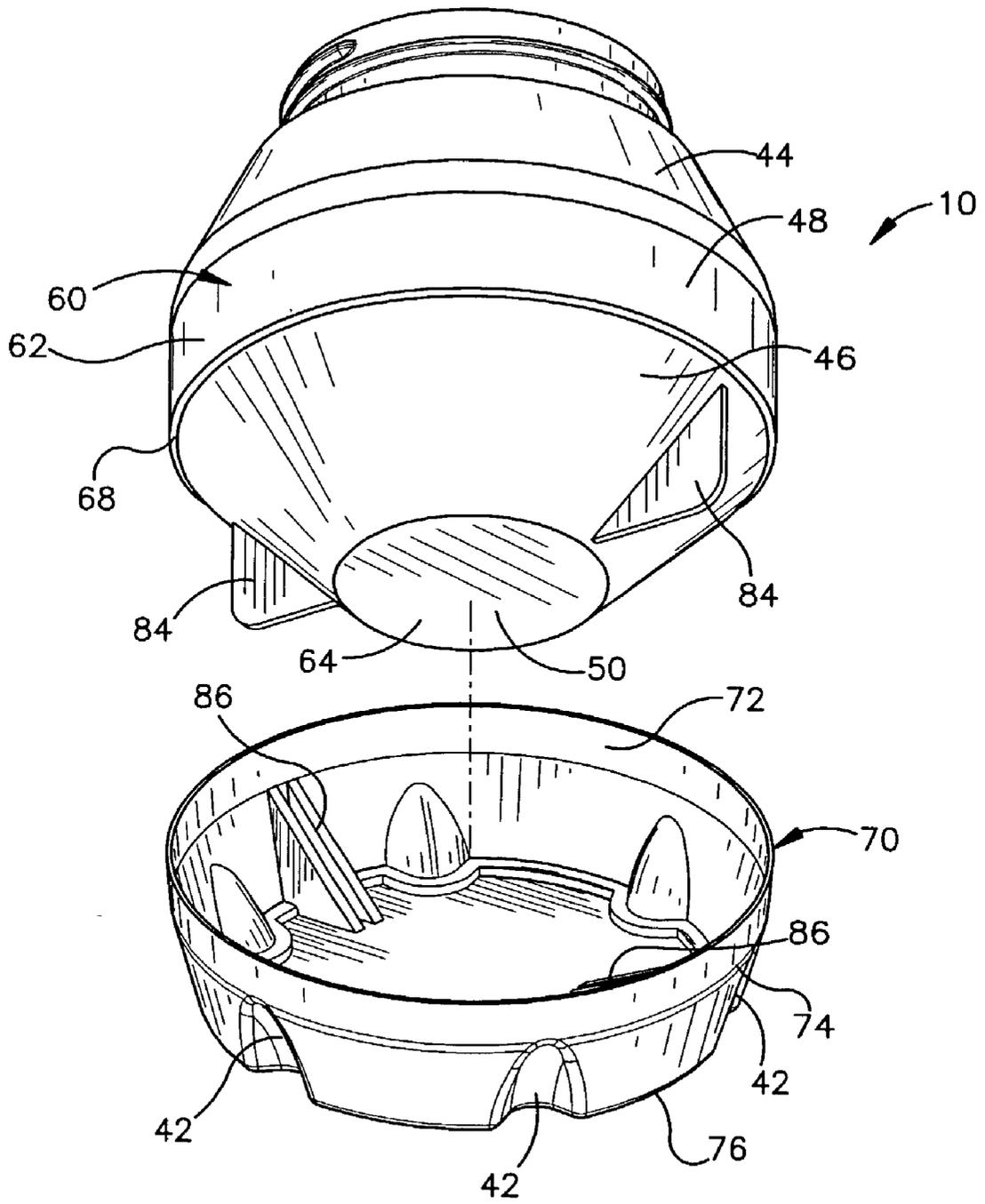


Fig.4



## PAIN T CUP FOR PAINT SPRAYER

### FIELD OF THE INVENTION

[0001] The claimed invention relates to a paint cup for a paint sprayer. In particular, the invention concerns a paint cup that is easily grippable by a user.

### BACKGROUND OF THE INVENTION

[0002] Currently known hand-held airless paint sprayers utilize a paint cup as a reservoir for storing a fluid that is sprayed onto a surface. The paint cup is typically attached to the paint sprayer housing via a lid that is connected to the housing. Screw threads are often positioned at the top of the paint cup and coupled to screw threads on the lid. The paint cup is removable from the lid for filling. In order to remove or replace the paint cup from the paint sprayer, a user typically grasps the bottom or side of the paint cup and rotates the paint cup to disengage or engage the screw threads.

[0003] In order for the paint sprayer to pump fluid from the paint cup, a suction hose or tube extends from the housing into the paint cup. The suction hose is preferably positioned at the bottom of the paint cup in order to pump as much fluid out of the paint cup as possible before having to refill the cup.

### SUMMARY

[0004] According to the claimed invention, a reservoir for use with an airless paint sprayer comprises a base wall, a side wall and a plurality of indentations. The side wall extends upwardly from the base wall. The side wall has an upper end and a lower end, with an opening positioned at the upper end for introduction of a material into the reservoir through the opening. The plurality of indentations are positioned around the lower end of the side wall and extend from an intermediate point between the upper and lower ends of the side wall to and through the base wall. Each of the plurality of indentations has a length, a cross-section, and a profile and at least one of the cross-section and profile varies along the length.

[0005] In another embodiment, a reservoir for attaching to a handheld paint sprayer comprises a body member and a base member. The body member includes a first base wall and a first side wall extending upwardly from the first base wall. The first side wall and first base wall together define a container for the storage of a fluid. The first side wall has an upper end and a lower end and defines an opening through which the fluid is introduced into the body member at the upper end. The upper end is configured to attach to a paint sprayer. The base member has a second side wall and a second base wall and is coupled to the lower end of the first side wall over the first base wall. The base member has an open upper end and a closed lower end.

[0006] In yet another embodiment, a reservoir for use with a handheld paint sprayer having a lid for coupling to the reservoir comprises a base wall, a side wall, and a rim extending upwardly from the side wall. The base wall has a generally circular shape and the side wall extends upwardly from the base wall. The rim extends upwardly from the side wall and defines an opening through which a material is introduced into the reservoir. The rim is configured to couple

to a lid of a paint sprayer. The side wall comprises an upper frustoconical part, a middle cylindrical part, and a lower frustoconical part. The upper frustoconical part has an upper end and a lower end and a diameter at the lower end that is larger than the diameter at the upper end. The middle cylindrical part is connected to the lower end of the upper frustoconical part. The lower frustoconical part has an upper end and a lower end and a diameter at the lower end that is smaller than the diameter at the upper end. The upper end of the lower frustoconical part is connected to the middle cylindrical part and the lower end of the lower frustoconical part is connected to the base wall.

### BRIEF DESCRIPTION OF THE DRAWING FIGURES

[0007] FIG. 1 is a perspective view of one embodiment of the paint cup of the invention shown installed on a paint sprayer;

[0008] FIG. 2 is a side view of the paint cup of FIG. 1;

[0009] FIG. 3 is a bottom view of the paint cup of FIG. 1;

[0010] FIG. 4 is an exploded view of a two-part paint cup according to another embodiment of the invention;

[0011] FIG. 5 is a side cross-sectional view of the two-part paint cup shown in FIG. 4; and

[0012] FIG. 6 is a cross-sectional view of the indentation shown in FIG. 2 at line 6-6.

### DETAILED DESCRIPTION OF THE INVENTION

[0013] The present invention relates to a paint cup 10 that is utilized with a handheld airless paint sprayer 12. The paint cup 10 is a reservoir that is attached to the paint sprayer 12, as shown in FIG. 1, and is used to store paint. Paint is suctioned from the paint cup 10 through the sprayer 12 and is sprayed onto a surface. The paint cup 10 is used to store a variety of fluids, including paint, primer, and polyurethane, among other fluids. The invention is discussed herein in the context of a paint sprayer 12. However, it may be utilized in applying other types of fluids, the invention not being limited only to a reservoir for storing paint.

[0014] Referring to FIGS. 1-3, the paint sprayer 12 has a housing 14, a lid 16, a tip 18, a tip guard 20, a handle 22, and a trigger or actuator 24 for operating the device. The paint cup 10 is coupled to the lid 16 of the paint sprayer 12 and has an upper opening 26 that is surrounded by a rim 28. A side wall 30 surrounds the paint cup 10 on the sides and a base wall 32 is positioned at the bottom of the side wall 30. The side and base walls 30, 32 together form a reservoir into which paint or other fluids may enter the paint cup 10 through the upper opening 26. The base wall 32 provides a base surface 34 on which the paint cup 10 may rest. Advantageously, the base wall 32 has a substantial enough size to provide a surface 34 on which the entire paint sprayer 12 may rest when the paint cup 10 is attached to the sprayer 12. The paint sprayer 12 and the paint cup 10 are preferably designed to balance on the base wall 32 of the paint cup 10 for upright storage during non-use. The base 36 of the handle 20 may also provide an additional support surface, as shown in FIG. 1.

[0015] Screw threads 38 are positioned on an exterior surface of the rim 28 of the paint cup 10 and are configured to couple with mating screw threads that are positioned on an interior surface (not shown) of the lid 16. In use, the paint cup 10 is typically grasped around its base wall 32 and/or side wall 30 and rotated in order to screw or unscrew the screw threads 38 on the rim 28 from or onto the lid 16.

[0016] The paint cup 10 is preferably an enlarged version of conventional paint cups in that it is sized to hold one quart of fluid. This enlarged cup has a larger diameter opening 26 (also referred to as a mouth) than is conventionally utilized. The mouth 26 is sized in order to allow a user to insert a hand inside the cup for cleaning purposes. The larger size makes the cup more readily cleanable and allows for longer spray periods due to the ability to store greater quantities of paint in the cup. The larger size, however, also makes it more difficult to screw and unscrew the paint cup 10 from the lid 16 of the sprayer 12, particularly for users with smaller hands who find it difficult to grasp the enlarged base wall 32 or side wall 30. Thus, a preferred embodiment of the invention also provides finger grips 40 around the bottom of the paint cup 10. The finger grips 40 comprise slots or indentations 42 into which a user's fingers are guided. When the user's fingers are positioned in the finger grip slots 42, the user has more leverage to turn the paint cup 10.

[0017] The geometry of a preferred finger grip slot is shown in FIGS. 2, 3, 5, and 6. The finger grip slots 42 have a generally V-shaped side profile and a generally V-shaped cross-section (shown in FIG. 6). The V-shaped side profile and cross-section provide a V-shaped slot 42 that better conforms to the fingers of the user. The fuller parts of the user's fingers generally fall into the wider part of the slots 42 at the base wall 32 and the thinner parts of the finger fall into the upper parts of the slots 42, which are narrower. The tips of the fingers either extend outside the grips 40 on the side wall 30 for longer fingers, or are positioned in the upper parts of the slots 42 for shorter fingers.

[0018] The finger grips 40 are positioned around the bottom of the paint cup 10 in spaced intervals so that when a user's palm rests against the base wall 32, the fingers of the user's hand are guided into adjacent finger grips 40. When the fingers are positioned in the slots 42, the fingers can push against the surface surrounding the slots 42 during rotation. This provides leverage for the user during rotation of the cup 10. Moreover, the user's fingers fall easily into the slots 42 of the finger grips 40 due to their V-shaped profile so that the user's hand is often deterred from slipping during rotation of the paint cup 10. In a preferred embodiment, shown in FIG. 3, the finger grips 40 are evenly spaced around the bottom of the paint cup 10, although other spacings may also be utilized.

[0019] Referring again to FIGS. 1 and 2, the paint cup 10 has an outer profile that includes an upper frustoconical part 44, a lower frustoconical part 46, a central cylindrical part 48, and a rim 28. The rim 28 is connected to the upper frustoconical part 44. The upper frustoconical part 44 and lower frustoconical part 46 each have a cone shape, with the larger diameter of the cone being positioned adjacent the central cylindrical part 48. Because of the size of the paint cup 10, the upper frustoconical part 44 tapers to a smaller diameter where it joins to the rim 28. By utilizing a tapered, conical portion adjacent the rim 28, a smaller diameter lid 16

is utilized on the paint sprayer 12 than would otherwise be required if the upper frustoconical part 44 were cylindrical. This makes it more practicable to attach the enlarged paint cup 10 to a paint sprayer 12, since the size of the lid 16, which is attached to the housing 14, may be minimized. The use of an upper frustoconical part 44 also provides a space between the actuator 24, the handle 20, and the paint cup 10 where the user's hand is positioned during use.

[0020] The lower frustoconical part 46 is tapered with the smaller diameter of the cone shape being positioned at the bottom. The taper helps to direct the fluid in the paint cup 10 toward the bottom, center 50 of the paint cup 10. A suction hose for suctioning paint from the paint cup 10 to the housing 14 (not shown) of the paint sprayer 12 is generally positioned in the bottom, center 50 of the paint cup 10. By directing the paint into the center of the paint cup 10, more paint is ensured to be suctioned from the paint cup 10 through the hose, which preferably extends from the paint sprayer housing 14 to the bottom center 50 of the paint cup 10. In addition, the taper of the outer surface of the lower part 46 makes the diameter of the base wall 32 smaller. The smaller base is easier to grip by users, who have varied hand sizes.

[0021] The lower frustoconical part 46 may comprise an upper portion 52 and a lower portion 54. The upper portion 52 is angled at a first angle  $\alpha$  relative to the base wall 32 and the lower portion 54 is angled at a second angle  $\beta$  relative to the base wall 32. The first angle  $\alpha$  is smaller than the second angle  $\beta$ . In one embodiment, the finger grips 40 are positioned in the lower portion 54. In another embodiment, the finger grips 40 extend the entire height of the lower frustoconical part 46. In yet another embodiment, the finger grips 40 extend into the upper and lower portions 52, 54.

[0022] According to another aspect of the invention, the paint cup 10 is formed from two separately formed members that are joined together. The two-part paint cup is shown in FIGS. 4 and 5 and includes a body member 60 and a base member 70. The body member 60 includes the upper opening 26 surrounded by the rim 28, a first side wall 62, and a first base wall 64. The rim 28 is connected to the upper end of the first side wall 62 and the first base wall 64 is connected to the lower end of the first side wall 62. The first side and base walls 62, 64 of the body member 60 form a reservoir into which paint is poured through the upper opening 26. The rim 28 is configured to couple to the lid 16 of the paint sprayer 12, as discussed above. In a preferred embodiment, the body member 60 first side wall 62 has an upper frustoconical part 44, a lower frustoconical part 46 and a central cylindrical part 48.

[0023] The base member 70 includes an open upper end 72 that is surrounded by a second side wall 74 and a second base wall 76. Finger grip slots 42 are positioned around the second side and base walls 74, 76 of the base member 70 in spaced intervals. In a preferred embodiment, the slots 42 are evenly spaced around the second base and side walls 76, 74. The base member 70 serves as a base for the paint cup 10 and provides a wide bottom on which the paint cup 10 may rest during filling. In addition, the base member 70 of the paint cup 10 serves as a resting surface for the entire paint sprayer 12, when it is installed on a paint sprayer 12. The base member 70 is configured to seat adjacent the first base wall and first side wall 62, 64 of the body member 60 to form a single paint cup 10.

[0024] As discussed above in connection with FIGS. 1-3, the upper and lower frustoconical parts 44, 46 provide benefits associated with the overall design and use of the paint sprayer 12. The lower frustoconical part 46 serves an additional benefit when used with the two-part paint cup design. In particular, the second base wall 76 of the base member 70 replaces the first base wall 64 of the lower frustoconical part 46 of the body member 60 as the base surface 34 for the paint cup 10. Advantageously, the lower frustoconical part 46 may have a more greatly sloped taper than if the lower frustoconical part were required to serve as the base surface 34 for the paint cup 10. Since the two-part design allows for a more greatly sloped lower frustoconical part, more paint is funneled to the bottom, center 50 of the paint cup 10 and can be suctioned through the hose.

[0025] As shown in FIG. 5, the lower end 66 of the body member 60 and the base member 70 are preferably dimensioned so that when the base member 70 seats against the lower end 66 of the body member 60, a smooth outer surface of the paint cup 10 is defined. In order to provide a smooth outer surface, the lower end 66 of the body member 60 preferably includes an inset 68 to provide space for the second side wall 74 of the base member 70. The base and body members 70, 60 may also include complementary parts that provide a seat 78 in the bottom of the base member 70 for the body member 60. For example, as shown in FIG. 5, the lower end 66 of the body member 60 turns from a taper to a cylindrical portion 80 and the inner surface of the base member 70 includes protrusions 82 that are configured to grasp the cylindrical portion 80 of the body member 60. The inner protrusions 82 serve to guide the body member 60 into proper position within the base member 70 so that the body member 60 is centered within the base member 70, among other benefits.

[0026] The body member 60 is connected to the base member 70 by attachment features. As shown in FIG. 4, one type of attachment feature includes a pair of fins 84 that extend outwardly from the first side wall 62 at the lower end of the body member 60. The fins 84 are configured to mate with corresponding slots 86 in the base member 70, shown in FIGS. 4 and 5. The attachment feature is preferably designed so that it is not visible when the body member 60 is connected to the base member 70. Other types of attachment features may alternatively be provided, such as glue, welds, screw threads, bayonets, screws and the like.

[0027] In a preferred embodiment, the base member 70 is fixed to the body member 60 using the attachment feature, although the base member 70 may be removable from the body member 60 if so desired. Separately formed body and base members 60, 70 allow for greater design variations than would be possible with a single member paint cup 10. For example, differently colored body and base members 60, 70 may be utilized and the members can be made from different types of materials. For instance, the body member 60 can be formed of a clear plastic material while the base member 70 can be formed from an opaque colored plastic material for contrast. In a preferred embodiment, the body member 60 is made of a polyethylene and the base member 70 is made of a polyethylene. In addition, the members can have different sizes and configurations. For instance, the base member 70, while shown as being frustoconical in the figures, is not required to be frustoconical in all embodiments of the two-part design. The base member 70 can take on other

shapes and sizes. For instance, it may be advantageous to provide a base that has a greater diameter than the largest diameter of the paint cup 10. Furthermore, while the embodiments shown in the figures include finger grips 40, some of the claimed embodiments do not require finger grips 40.

[0028] The paint cup 10 may include volume indicators 88, shown in FIG. 1, on the side wall 30 of the paint cup 10 for determining how much paint remains in the paint cup 10. The volume indicators 88 are particularly useful when the body member 60 of the paint cup 10 is transparent.

[0029] In an alternative embodiment, the paint cup 10 is formed as a one-part paint cup 10, where the finger grips 40 are integrally molded into the shape of the reservoir. The reservoir has the same basic shape as shown in FIGS. 1-6, with the finger grips 40 positioned around the side and base walls 30, 32.

[0030] The finger grips 40 are shown and described as being evenly spaced around the bottom of the paint cup 10, with six finger grips 40 being provided. The spacing of the finger grips 40 may vary, with some of the grips 40 being closer to others of the grips 40. In addition, more or less than six grips 40 may be provided, although it is preferred that at least four or five grips 40 are provided to accommodate the four fingers and thumb of a user's hand.

[0031] In a preferred embodiment, the paint cup 10 is a one quart paint cup and includes six finger grips 40 that are spaced around the base surface 34. The rim 28 of the upper opening 26 has a diameter of approximately 3.3 inches and the base surface 34 of the paint cup 10 has a diameter of approximately 4.2 inches. The finger grips have a height of approximately 1 inch and a depth at the base wall of approximately 0.3 inches. The overall height of the paint cup 10 is about 4.9 inches and its width at the central cylindrical wall 48 is approximately 5.3 inches. The dimensions may vary from the above-described dimensions, which are provided for exemplary purposes only.

[0032] The paint cup 10 may be manufactured utilizing blow molding or other techniques. The body member 60 and base member 70 can be separately blow molded and then joined together using any of the above-described techniques.

[0033] While various features of the claimed invention are presented above, it should be understood that the features may be used singly or in any combination thereof. Therefore, the claimed invention is not to be limited to only the specific embodiments depicted herein.

[0034] Further, it should be understood that variations and modifications may occur to those skilled in the art to which the claimed invention pertains. The embodiments described herein are exemplary of the claimed invention. The disclosure may enable those skilled in the art to make and use embodiments having alternative elements that likewise correspond to the elements of the invention recited in the claims. The intended scope of the invention may thus include other embodiments that do not differ or that insubstantially differ from the literal language of the claims. The scope of the present invention is accordingly defined as set forth in the appended claims.

What is claimed is:

1. A reservoir for use with an airless paint sprayer comprising:

- a base wall;
- a side wall extending upwardly from the base wall and having an upper end and a lower end, with an opening positioned at the upper end for the introduction of a material into the reservoir through the opening; and
- a plurality of indentations positioned around the lower end of the side wall, said indentations extending from an intermediate point between the upper and lower ends of the side wall to and through the base wall, wherein each of the plurality of indentations has a length, a cross-section, and a profile and at least one of the cross-section and profile varies along the length.

2. The reservoir of claim 1, wherein the plurality of indentations fade from a larger cross-section at the base wall to the intermediate point.

3. The reservoir of claim 1, wherein the plurality of indentations fade from a larger profile at the base wall to the intermediate point.

4. The reservoir of claim 3, wherein the plurality of indentations fade from a larger cross-section at the base wall to the intermediate point.

5. The reservoir of claim 1, wherein the plurality of indentations have a V-shaped profile and a V-shaped cross-section.

6. The reservoir of claim 1, wherein the side wall comprises:

- an upper frustoconical part with an upper end and a lower end and having a diameter at the lower end that is larger than the diameter at the upper end, wherein the upper end includes the opening and is for coupling to a paint sprayer;
- a middle cylindrical part connected to the lower end of the upper part, the middle part having an upper end and a lower end;
- a lower frustoconical part with an upper end and a lower end and having a diameter at the lower end that is smaller than a diameter at the upper end, with the upper end of the lower frustoconical part connected to the lower end of the middle cylindrical part and the lower end of the lower frustoconical part connected to the base wall,

wherein the plurality of indentations are positioned in the lower frustoconical part.

7. The reservoir of claim 1, wherein the reservoir comprises a body member and a base member that are connected to form the reservoir, with the base wall being positioned on the base member and the side wall being positioned on the body member and the base member.

8. A reservoir for attaching to a handheld paint sprayer comprising:

- a body member including a first base wall and a first side wall that together define a container for the storage of a fluid, with the first side wall extending upwardly from the first base wall, and the first side wall having an upper end and a lower end and defining an opening at the upper end through which a fluid is introduced into

the body member, with the upper end being configured to attach to a paint sprayer; and

- a base member having a second side wall and a second base wall, with the second side wall and second base wall being coupled to the lower end of the first side wall over the first base wall, the base member having an open upper end for receiving the lower end of the body member and a closed lower end.

9. The reservoir of claim 8, wherein the base member further comprises a plurality of indentations, each of which extends from the second side wall to and through the second base wall.

10. The reservoir of claim 9, wherein each of the plurality of indentations has a length, a cross-section and a profile, and at least one of the cross-section and profile varies along the length.

11. The reservoir of claim 9, wherein each of the plurality of indentations has a V-shaped cross-section and a V-shaped profile, and the indentations are evenly spaced around the base and comprise at least four indentations.

12. The reservoir of claim 8, further comprising a coupling mechanism for coupling the body member to the base member.

13. The reservoir of claim 12, further comprising a coupling mechanism for coupling the body member to the base member, the coupling mechanism comprising a first attachment member positioned at the lower end of the body member and a second attachment member positioned inside the body member.

14. The reservoir of claim 13, wherein the first attachment member includes at least two fins that extend outwardly at the lower end of the body member and the second attachment member includes at least two slots positioned on the base member, said fins and slots being configured so that the fins fixedly engage the slots to attach the body member to the base member.

15. The reservoir of claim 8, wherein the body member comprises an upper part at the upper end coupled to a frustoconical part at the lower end, the lower part having a frustoconical shape with a smaller diameter at the lower end, with the first base wall connected to the lower end of the lower part, and the plurality of indentations are positioned in the lower frustoconical part.

16. The reservoir of claim 15, wherein the upper part includes an upper frustoconical part at the upper end and a central cylindrical part below the upper frustoconical part, with the lower frustoconical part connected to the central cylindrical part.

17. The reservoir of claim 8, wherein the first base wall has a first shape and the second base wall has a second shape, with the first shape being different from the second shape, and the second base wall has a size that is larger than a size of the first base wall.

18. The reservoir of claim 8, wherein the body member comprises a first material and the base member comprises a second material, and the first material has a first color and the second material has a second color.

19. The reservoir of claim 18, wherein the first color is different from the second color and the first material is the same as the second material.

20. A reservoir for use with a handheld paint sprayer having a lid for coupling to the reservoir, the reservoir comprising:

a base wall having a generally circular shape;  
 a side wall extending upwardly from the base wall; and  
 a rim extending upwardly from the side wall, the rim defining an opening through which a material is introduced into the reservoir and being configured to couple to a lid of a paint sprayer;

the side wall comprising:

an upper frustoconical part with an upper end and a lower end and having a diameter at the lower end that is larger than the diameter at the upper end, with the rim extending upwardly from the upper frustoconical part;

a middle cylindrical part connected to the lower end of the upper frustoconical part;

a lower frustoconical part with an upper end and a lower end and having a diameter at the lower end that is smaller than the diameter at the upper end, with the upper end of the lower frustoconical part being connected to the middle cylindrical part and the lower end of the lower frustoconical part being connected to the base wall.

**21.** The reservoir of claim 20, further comprising a plurality of indentations positioned around the lower frustoconical part of the side wall, said indentations extending from an intermediate point in the vicinity of the upper end

of the lower frustoconical part to and through the base wall, with the indentations providing a gripping area on the reservoir.

**22.** The reservoir of claim 21, wherein the indentations have a cross-section that varies from the base wall to the intermediate point.

**23.** The reservoir of claim 22, wherein the cross-section of the indentations has a larger dimension at the base wall than at the intermediate point.

**24.** The reservoir of claim 21, wherein each of the plurality of indentations has a V-shaped cross-section and a V-shaped profile.

**25.** The reservoir of claim 21, wherein the plurality of indentations are evenly spaced around the lower frustoconical part and comprise at least four indentations.

**26.** The reservoir of claim 21, wherein the lower frustoconical part has an upper portion and a lower portion, with the upper portion having an angle relative to the base wall and the lower portion having an angle relative to the base wall, with the upper portion angle being different from the lower portion angle, and with the indentations being formed in the lower portion.

**27.** The reservoir of claim 21, wherein the intermediate point is positioned at the upper end of the lower frustoconical part.

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