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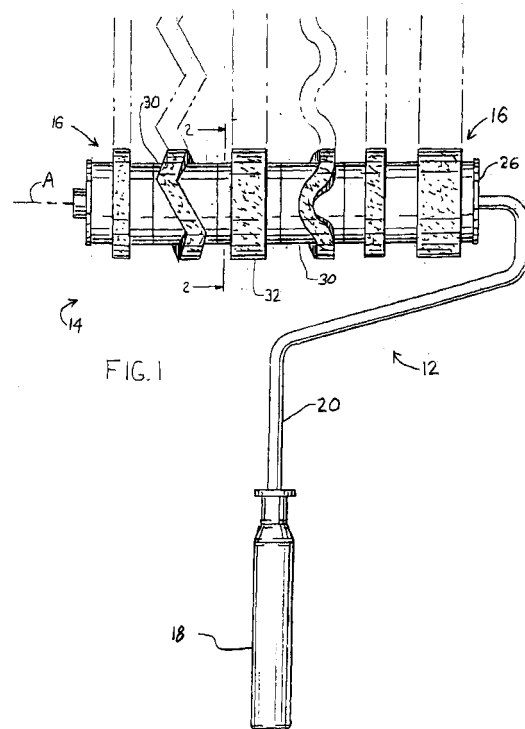
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(54) **Modular applicator kit**

(57) A modular applicator kit for use with a liquid applicator is disclosed. The modular applicator kit includes a plurality of segments (16) adapted to be coupled to the liquid applicator. Each segment (16) includes a core, a raised portion supported by the core and configured to contact and transfer paint to a surface, and a depressed portion configured to not contact the surface. A method of providing a paint roller for use in applying a decorative effect to a surface is also disclosed. The method includes positioning a first segment (16) having a first decorative effect on the paint roller and positioning a second segment (16) having a second decorative effect that is different from the first decorative effect on the paint roller. A liquid applying system is further disclosed. The liquid applying system includes a liquid applicator, and a plurality of segments (16) coupled to the liquid applicator. Each segment (16) includes a core, a raised portion supported by the core and configured to contact and transfer paint to a surface, and a depressed portion configured to not contact the surface.



## Description

### FIELD OF THE INVENTION

[0001] The present invention relates to apparatuses for applying paint and other liquid coatings to surfaces, and more particularly, to apparatuses for creating customized patterns.

### BACKGROUND OF THE INVENTION

[0002] Paint applicators are generally used to apply paint to surfaces such as walls, ceilings, floors, objects (e.g., cars, boats, or the like), etc. One type of typical paint applicator includes a frame, a handle coupled to one end of the frame, and a roller cage rotatably coupled to the other end of the frame. The cage is configured to slideably receive a single replaceable paint roller that spans substantially the entire length of the roller cage. The paint roller includes a core and a paint absorbing material covering the core, which is generally made of simulated lambs wool or other cellular material that can retain paint. In use, the applicator is rolled through a paint reservoir so that the material on the roller absorbs or takes up paint. The roller may include a textured surface so that the roller delivers a patterned coating. Conventional textured rollers are configured to span the entire length of the cage; that is, the core is substantially the same length as the roller cage. As such, the variety of possible patterned coatings is dictated by rollers made available for purchase from the manufacturers.

[0003] Although the described systems may be used to create attractive patterns, the conventional roller has several disadvantages. Because the roller is one piece, the roller frame can only be used for applying one texture or pattern. As a result, the conventional roller frame is limited to the particular texture or a particular pattern that is provided to the roller and cannot be customized by the user according to his or her tastes or the requirements of an application. Because the rollers span the entire roller cage, desirable complex or customized patterns are complex and expensive.

[0004] Thus, there is a long felt need to provide a paint applicator that permits the user to customize the patterns and textures of paint delivered by the applicator.

### SUMMARY OF THE INVENTION

[0005] The present invention relates to a modular applicator kit for use with a liquid applicator. The modular applicator kit includes a plurality of segments adapted to be coupled to the liquid applicator. Each segment includes a core, a raised portion supported by the core and configured to contact and transfer paint to a surface, and a depressed portion configured to not contact the surface.

[0006] The present invention also relates to a method of providing a paint roller for use in applying a decorative

effect to a surface. The method includes positioning a first segment having a first decorative effect on the paint roller and positioning a second segment having a second decorative effect that is different from the first decorative effect on the paint roller.

[0007] The present invention also relates to a liquid applying system. The liquid applying system includes a liquid applicator and a plurality of segments coupled to the liquid applicator. Each segment includes a core, a raised portion supported by the core and configured to contact and transfer paint to a surface, and a depressed portion configured to not contact the surface.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present invention will become more fully understood from the following detailed description, taken in conjunction with the accompanying drawings wherein like reference numerals refer to like parts, in which:

FIG. 1 is an elevational view of a paint applicator incorporating segments of the present invention; FIG. 2 is a sectional view of the paint applicator of FIG. 1 taken along lines 2 - 2; FIG. 3 is an exploded fragmentary elevational view of a paint applicator incorporating segments according to an alternative embodiment; and FIG. 4 is a fragmentary side elevational view of an alternative embodiment of the paint applicator shown in FIG. 3.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] FIG. 1 illustrates a paint applicator 10 for applying a paint to a surface. Paint applicator 10 includes a frame 12 and a modular applicator kit 14 having segments 16. Frame 12 is configured to rotatably support modular applicator kit 14 and may be manufactured using conventional manufacturing techniques associated with single shafted paint applicator. Frame 12 includes a handle 18, a shaft 20, and a roller cage 22. Roller cage 22 is rotatably supported about shaft 20 and is configured to support segments 16 about an axis A of shaft 20. As shown in FIG. 3, shaft 20 is a single elongate rod extending through roller cage 22 to rotatably support cage 22 about axis A. Cage 22 includes a pair of hubs 24 journaled about shaft 20 and interconnected by wires 26. Wires 26 are outwardly angled for frictional engagement with inner circumferential surfaces of segments 16. As a result, wires 26 prevent slippage or rotation of segments 16 relative to roller cage 22. According to an alternative embodiment, roller cage 22 may comprise other known cage structures integrally formed from plastic. According to alternative embodiments, handle 18, shaft 20, roller cage 22, hubs 24, or wires 26 may be formed from any number of plastic materials.

**[0010]** Modular applicator kit 14 includes a plurality of interchangeable segments 16. Segments 16 are generally tubular-shaped and are sized for being interchangeably positioned over and about roller cage 22 and removable from roller cage 22 for cleaning or replacement. As shown in FIGS. 1 and 2, segments 16 each include a rigid, tubular core 28, a depressed portion 30, and a raised portion 32. Core 28 is configured to support segments 16 upon roller cage 22 and is made from a plastic. According to a preferred embodiment, core 28 is formed from a multiplicity of spirally-wound, polypropylene plies that are wrapped around a fixed mandrel and bonded together by heating and contact engagement of the plies. Forming core 28 is further illustrated in U.S. Patent No. 5,206,968, the full disclosure of which is hereby incorporated by reference. According to an alternative embodiment, core 28 is formed from a single spirally-wound ply that is wrapped around a fixed mandrel and bonded together by heating and contact engagement of adjacent plies. According to an alternative embodiment, core 28 is formed by extrusion and cut to desired widths. According to alternative embodiments, core 28 is made from any number of a variety of materials, including cardboard, fiberboard, metal, or the like.

**[0011]** As shown in FIGS. 1 and 3, depressed portion 30 and raised portion 32 are disposed along the axial length and circumference of segments 16. Depressed portion 30 is configured to not contact the surface and to provide spacing between adjacent raised portions, which may or may not be on the same segment or on adjacent segments. Raised portion 32 provides a membrane 34 made from liquid absorbent material and is configured to contact the surface receiving the paint or liquid. Membrane 34 is made from a thermoplastic material such as acrylic, blended acrylic, or polyester fiber nap, and is configured to carry paint or other liquids (such as varnish, stain, primer, adhesive, lubricant, etc.) that are being applied upon a surface. According to alternative embodiments, membrane 34 may be made from any number of liquid absorbent materials including wool, simulated lambs wool, open-celled material (such as foam, or sponge), closed cell material, and material having liquid absorbent characteristics, or the like.

**[0012]** Membrane 34 is affixed to core 28. According to a preferred embodiment, membrane 34 is bonded or fused to core 28 by heating the exposed outer surface of core 28 (e.g., by gas ribbon burners) and applying membrane 34 in strip-form. Affixing membrane 34 to core 28 using heat is further illustrated in U.S. Patent No. 5,206,968 and U.S. Patent No. 5,468,207, the full disclosures of which are hereby incorporated by reference. According to an alternative embodiment, membrane 34 is bonded or fused to core 28 by applying an adhesive to the outer surface of core 28 and then applying membrane in strip-form thereto. Affixing membrane 34 to core 28 using an adhesive such as liquid polypropylene is further illustrated in U.S. Patent No. 5,572,790, the full disclosure of which is hereby incor-

porated by reference. According to alternative embodiments, membrane 34 is affixed to core 28 by double sided tape, interference-fit, or the like.

**[0013]** According to a preferred embodiment, depressed portion 30 and raised portion 32, which provide the decorative effect (e.g., pattern, texture, etc.) is formed by exposing membrane 34 to a heating element, which causes the exposed material to shrink down (e.g., melt, burn, singe, etc.). Forming depressed portion 30 and raised portion 32 using heat as further illustrated in an earlier filed, commonly owned U.S. patent application, U.S. Serial No. 09/134,554 titled "Method and Apparatus for Forming a Decorative Pattern in a Liquid Coating Applicator" and filed August 14, 1998, the full disclosure of which is hereby incorporated by reference. Alternatively, depressed portion 30 and raised portion 32 are formed by a chemically shrinking, melting, burning, dissolving, or weakening (such that material may be removed to form depressed portion 30). According to alternative embodiments, depressed portion 30 is formed by any number of a variety of methods for mechanically removing portions of membrane 34 such as shearing or cutting.

**[0014]** To prepare paint applicator 10 for use, segments 16 are selected by the user (e.g., as having the desired pattern or texture) and are inserted in the desired order onto roller cage 22. Modular applicator kit 14 is versatile such that selection and arrangement of segments 16 may be made by the user or as the application requires. As further shown in FIGS. 1 and 3, segments 16 may be variably positioned in any number of a variety of combinations or permutations and may have any number of a variety of decorative depressed portions 30 and raised portions 32 to provide an ornamental or decorative application. By selectively using and loading a variety of segments 16 on roller cage 22, the user may vary the width of the stripes as well as the spacing between the stripes being created upon the wall or other surface.

**[0015]** Segments 16 are successively located on roller cage 22 in close proximate relation to one another (e.g., configured to be in successively adjacent relation to one another) and have a variable axial length such that the total number of units span substantially the units entire length of cage 22. As such, a greater or lesser number of segments may be inserted on roller cage 22 (e.g., seven according to the embodiment illustrated in FIG. 3), which is intended to provide more customization and interchangeability, and provide a greater variety of patterns. According to a preferred embodiment, the core of one segment is in contact with the core of an adjacent segment. As can be appreciated, roller cage 22 as well as segments 16 may be axially spaced from one another about shaft 20 by a variety of distances and by a variety of alternative structures. For example, raised portion 32 of segments 16 may be positioned away from one another by utilizing a spacer 36 (i.e., a segment that does not have membrane 34 or raised portion 32) between

adjacent segments 16 having raised portions 32. In lieu of spacer 36, other structures could be used for slidably positioning segments 16 along roller cage 22 to provide the desired spacing therebetween. According to an alternative embodiment, the core of one segment is not in contact with the core of the adjacent segment.

**[0016]** Segments 16 are configured for creating any number of a variety of patterns and/or textures. As shown in FIGS. 1 and 3, the pattern may be applied by raised portions that are generally linear stripes of varying widths 38, 40a and 40b, zig-zag stripes 42, circular or dotted patterns 44, diagonal stripes 46, arcuate stripes 48, diagonal stripe segments 50, or the like on a surface (such as a wall, floor, ceiling, automobile, articles of manufacture, or the like). Patterns may be created by a plurality of raised portions 32 on a single segment (for example, narrower linear stripe 38 and wider linear stripe 40a, and diagonal stripe segments 50). Additionally, segments 16 are configured for creating any number of a variety of textures such that similar patterns having different textures provide a different decorative effect. As shown in FIG. 3, linear stripe 40a is provided with a different texture than linear stripe 40b. Different textures may be provided by using different membrane materials or material configurations (e.g., acrylic and polyester fabric, foam, looped fabric nap, etc.). Such different membranes may be used on separate segments or on separate raised portions on a single raised portion. Additionally, stripes of multiple colors may be applied when modular applicator kit 14 is used in conjunction with a multi-compartmentalized tray containing different color paints.

**[0017]** According to a preferred embodiment, frame 12 and/or modular applicator kit 14 are configured to prevent segments 16 from rotating with respect to each other or with respect to roller cage 22. According to a particularly preferred embodiment shown in FIG. 3, shaft 20 of frame 12 further includes a threaded portion 52 located at an end 54 of shaft 20. Threaded portion 52 is configured to threadably receive a retaining cap 56. According to alternative embodiments, retaining cap 56 couples to shaft 20 by any number of attachment methods, including an interference-fit, snap fit, quick release, or the like. A shoulder 58 is disposed at the opposite end of roller cage 22. Retaining cap 56 and shoulder 58 are configured to secure segments 16 in place and to prevent segments 16 from sliding longitudinally along roller cage 22 and to provide friction between adjacent segments 16 to prevent rotation of segments 16 relative to each other or relative to roller cage 22 while still enabling roller cage 22 to rotate about shaft 20. According to an alternative embodiment, segments 16 are sized to provide an interference fit with roller cage 22 (e.g., an inner diameter of the segment is approximately equal to the outer diameter of the roller cages).

**[0018]** According to an alternative embodiment (shown in FIG. 4), segments 16 are configured to prevent rotation relative to an adjacent segment. Segments

16 each includes a cleat 60 and a notch 62 configured to receive cleat 60 of the adjacent segment. When cleat 60 and notch 62 are engaged, the segments uniformly rotate about the shaft. According to an alternative embodiment, segments 16 are keyed to roller cage 22 or keyed to shaft 20 such that the segments do not rotate relative to the cage or one another.

**[0019]** Thus, modular applicator kit 14 provides several advantages over known conventional paint supply and finishing systems. First, the user may select and employ any number of a variety of segments 16 and combinations and presentations thereof to create different patterns and textures. Such a variable selection provides for a customized application. Further customization may be attained by employing a multi-compartmentalized tray. Second, segments 16 are mounted to the roller cage such that the segments do not rotate relative to each other and are slidably fixed to roller cage 22. Such a configuration is intended to provide a consistent deposition of liquid.

**[0020]** As will be appreciated, modular applicator kit 14 may have various other configurations while still embodying the concepts of the present invention. For example, applicator kit 14 may be configured for use with an alternative roller frame 12 configured to support greater than one roller cage and additional segments along shaft 20. In lieu of being removable from roller cage 22, each segment 16 may alternatively be integrally formed with roller cage 22 as a single unitary body or may be directly rotatably coupled to shaft 20 without the use of roller cage 22. Those skilled in the art will appreciate that certain of these advantages can be obtained separately through reconfiguring the foregoing structure without departing from the spirit and scope of the present invention. Additionally, although a paint applicator is discussed herein, it can be appreciated that the modular applicator kit may be employed in any number of a variety of applications wherein a liquid is applied to a surface.

**[0021]** Although the present invention has been described with reference to preferred embodiments, persons skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention. The present invention described with reference to the preferred embodiments and set forth in the following claims is manifestly intended to be as broad as possible. For example, unless specifically otherwise noted, the claims reciting a single particular element also encompass a plurality of such particular elements.

## Claims

1. A modular applicator kit for use with a liquid applicator, the modular applicator kit comprising:  
a plurality of segments adapted to be coupled to the liquid applicator, each segment including:

- a core;  
a raised portion supported by the core and configured to contact and transfer paint to a surface; and  
a depressed portion configured to not contact the surface.
2. The modular applicator kit of claim 1 wherein the segments are configured to be in successively adjacent relation to one another. 10
  3. The modular applicator kit of claim 2, further including means for preventing rotation of a first segment with respect to a second segment.
  4. The modular applicator kit of claim 3 wherein the means for preventing rotation of the first segment with respect to the second segment includes a cleat located on a first axial end of the first segment and a notch located on a second axial end of the second segment and configured to receive the cleat of the first segment. 20
  5. The modular applicator kit of claim 3 wherein the means for preventing rotation of the first segment with respect to the second segment includes a frictional engagement between the first segment and the second segment. 25
  6. The modular applicator kit of claim 3 wherein the means for preventing rotation of the first segment with respect to the second segment includes an end cap coupled to the liquid applicator. 30
  7. The modular applicator kit of claim 1, further including means for preventing lateral movement of the segments with respect to the liquid applicator. 35
  8. The modular applicator kit of claim 7 wherein the means for preventing lateral movement of the segments with respect to the liquid applicator includes an end cap adapted to be coupled to the liquid applicator. 40
  9. The modular applicator kit of claim 1 wherein one of the segments includes a plurality of raised portions. 45
  10. The modular applicator kit of claim 1 wherein the raised portion is adapted to provide a decorative effect to the surface. 50
  11. The modular applicator kit of claim 10 wherein a first segment provides a different decorative effect than a second segment. 55
  12. The modular applicator kit of claim 10 wherein the decorative effect is a pattern.
  13. The modular applicator kit of claim 12 wherein the pattern is a stripe.
  14. The modular applicator kit of claim 10 wherein the decorative effect is a texture.
  15. The modular applicator kit of claim 14 wherein the texture is formed from foam.
  16. The modular applicator kit of claim 1 wherein each segment further includes a structure adapted to support the core and configured for rotation about an axis.
  17. The modular applicator kit of claim 16 wherein the structure and the core are integrally formed.
  18. The modular applicator kit of claim 1, further including a spacer configured to provide a distance between segments.
  19. The modular applicator kit of claim 1 wherein the raised portion is formed by a liquid absorbent material.
  20. The modular applicator kit of claim 19 wherein the liquid absorbent material is affixed to the core by an adhesive.
  21. The modular applicator kit of claim 20 wherein the adhesive is a thermoplastic.
  22. The modular applicator kit of claim 19 wherein the liquid absorbent material is formed from a liquid absorbent and carrying medium.
  23. The modular applicator kit of claim 19 wherein the liquid absorbent material is a fabric.
  24. The modular applicator kit of claim 23 wherein the liquid absorbent material includes at least one of wool, simulated lambs wool, polyester, acrylic, blended acrylic, polyester, and material having liquid absorbent characteristics.
  25. The modular applicator kit of claim 19 wherein the raised portion includes at least one of fabric, foam, sponge, and cellular material.
  26. The modular applicator kit of claim 1 wherein a segment includes a raised portion that extends less than 360° about an axis formed by the segment.
  27. The modular applicator kit of claim 1 wherein a segment includes a raised portion disposed between a first recessed portion and a second recessed portion.

28. The modular applicator kit of claim 1 wherein the raised portion has a radial height of at least one centimeter greater than the recessed portion.
29. The modular applicator kit of claim 1 wherein the core is thermoplastic. 5
30. The modular applicator kit of claim 1 wherein the depressed portion are formed by heat embossing. 10
31. The modular applicator kit of claim 1 wherein the depressed portion and the recessed portion are formed by removal of material.
32. A method of providing a paint roller for use in applying a decorative effect to a surface, the method comprising: 15
- positioning a first segment having a first decorative effect on the paint roller, 20
- positioning a second segment having a second decorative effect that is different from the first decorative effect on the paint roller.
33. The method of claim 32 further including the step of selecting the first segment as having one of a first pattern and a first texture, and the step of selecting the second decorative effect as having one of a second pattern and a second texture, wherein at least one of the first pattern and first texture are different from one of the second pattern and second texture, 25 30
34. The method of claim 32, further including the step of inserting the first and second segments onto a structure rotatably coupled to the paint roller. 35
35. The method of claim 34, further including the step of coupling an end cap to the paint roller.
36. The method of claim 34, further including the step of aligning a cleat on the first segment with a notch on the second segment. 40
37. The method of claim 32, further including the step of providing a spacer between the first and second segments. 45
38. A liquid applying system, comprising:
- a liquid applicator; and 50
- a plurality of segments coupled to the liquid applicator, each segment including:
- a core; 55
- a raised portion supported by the core and configured to contact and transfer paint to a surface; and
- a depressed portion configured to not contact the surface while the raised portion is in contact with the surface.
39. The liquid applying system of claim 38 wherein the liquid applicator includes a handle, a frame coupled to the handle, a shaft extending from an opposite end of the frame from the handle, and a structure configured to support the core and to rotate about an axis formed by the shaft.
40. The liquid applying system of claim 39 wherein the structure includes a plurality of wires rotatably coupled to the liquid applicator and configured to receive the segments.
41. The liquid applying system of claim 39 wherein the structure is made from thermoplastic material.
42. The liquid applying system of claim 39 wherein the structure and the core are integrally formed.

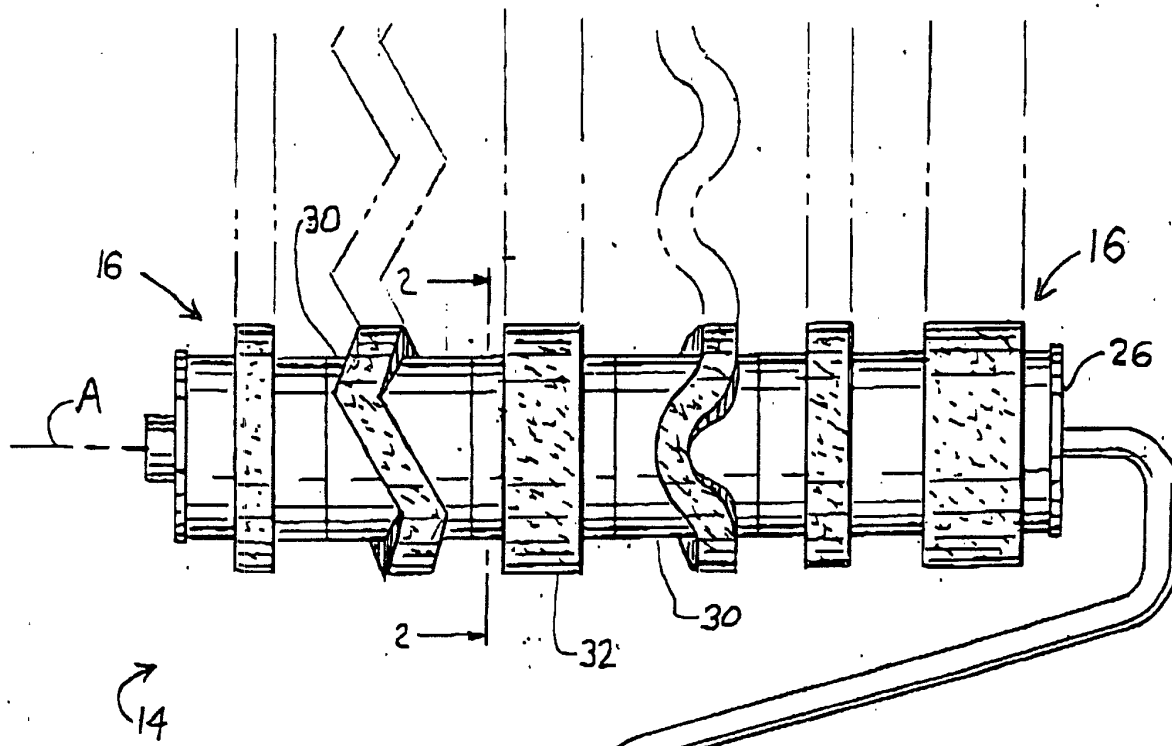


FIG. 1

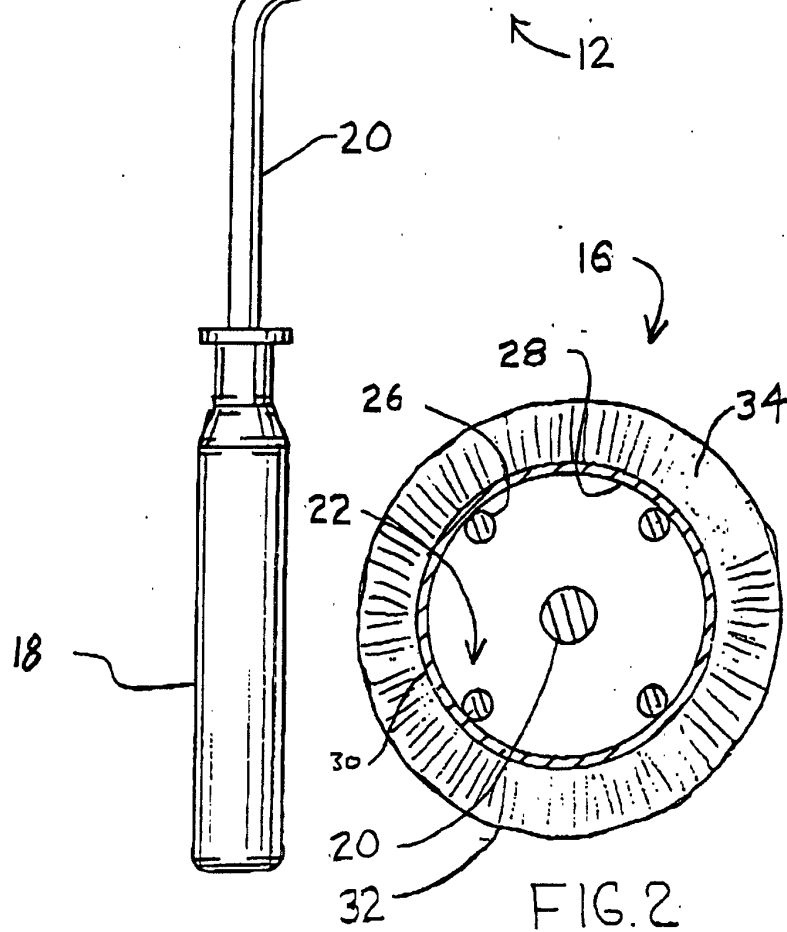


FIG. 2

