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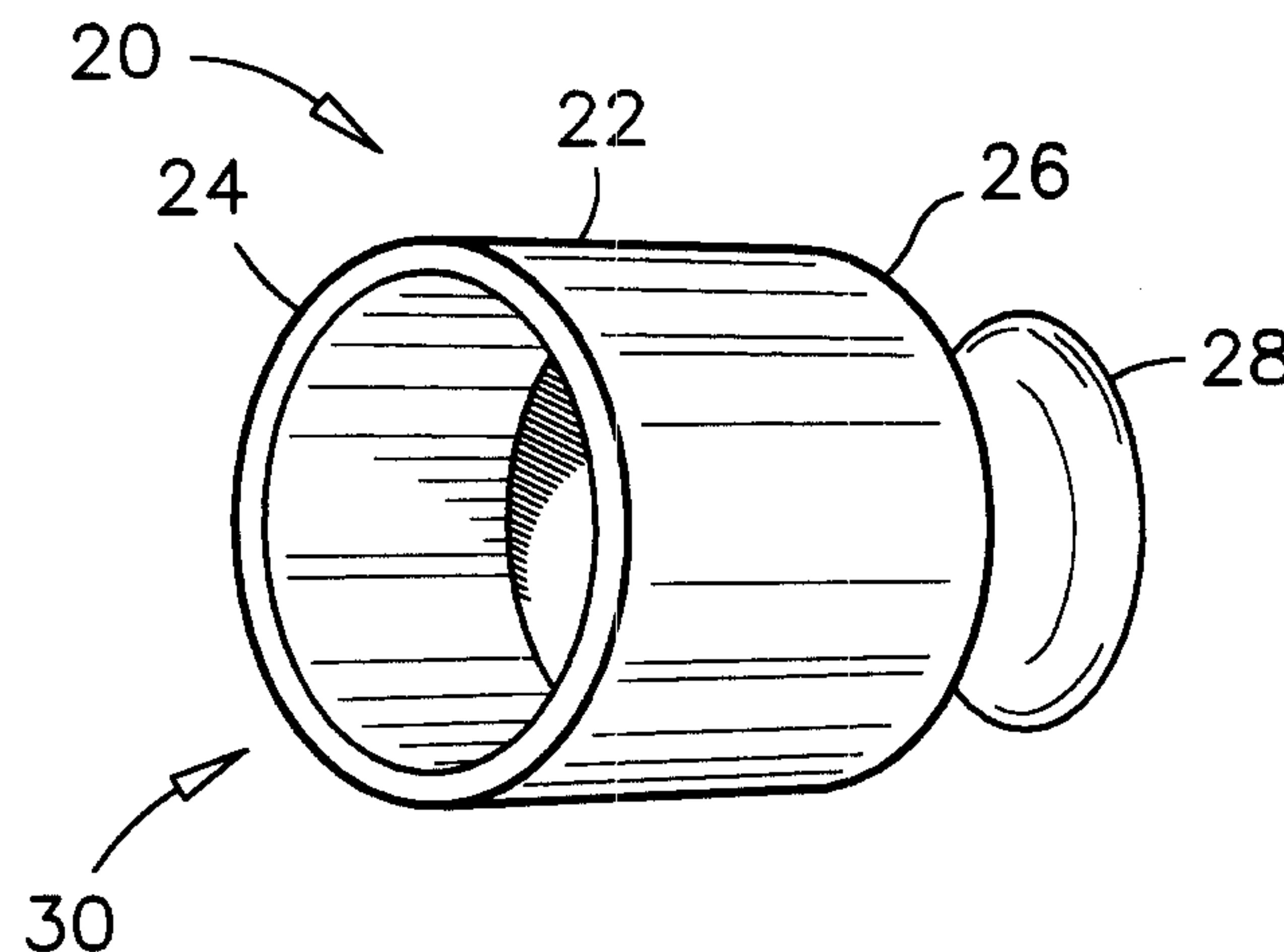
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(54) Titre : OUTIL ET METHODE DE FACONNAGE DE CONTENEURS CYLINDRIQUES

(54) Title: TOOL AND METHOD FOR FORMING CYLINDRICAL CONTAINERS



(57) Abrégé/Abstract:

The cylindrical container is made of paper and has a rim, a seam along the vertical dimension thereof and an overlap in that seam. The bottom end of the container has a twisted and flattened tuft of paper. A fold is provided around the rim. This fold encloses the overlap crosswise for retaining the shape of the container. The paper container is usable as a seedling pot. There is also provided a hand tool for manually forming these paper containers. This hand tool comprises a cylindrical body having a diameter, a closed end and an open end, and a handle mounted to the closed end. The hand tool also has a cavity extending inside the cylindrical body from the open end, where the tuft of paper is pushed in during the forming of the bottom end of the container. There is also provided a method for forming paper containers using the hand tool.



**TITLE: TOOL AND METHOD FOR FORMING CYLINDRICAL  
CONTAINERS**

**ABSTRACT OF THE DISCLOSURE**

The cylindrical container is made of paper and has a rim, a seam along the vertical dimension thereof and an overlap in that seam. The bottom end of the container has a twisted and flattened tuft of paper. A fold is provided around the rim. This fold encloses the overlap crosswise for retaining the shape of the container. The paper container is usable as a seedling pot. There is also provided a hand tool for manually forming these paper containers. This hand tool comprises a cylindrical body having a diameter, a closed end and an open end, and a handle mounted to the closed end. The hand tool also has a cavity extending inside the cylindrical body from the open end, where the tuft of paper is pushed in during the forming of the bottom end of the container. There is also provided a method for forming paper containers using the hand tool.

## **TITLE: TOOL AND METHOD FOR FORMING CYLINDRICAL CONTAINERS**

### **FIELD OF THE INVENTION**

The present invention relates to cylindrical paper containers, to hand tools and methods for making cylindrical paper containers, and more particularly, it relates to the making of horticulture-type seedling pots.

### **BACKGROUND OF THE INVENTION**

5           In commercial silviculture operations, in greenhouses as well as in  
hobby gardening, plants are commonly germinated and grown to show a  
few leaves before they are transplanted in a real soil. Plants are generally  
started in seedling pots made of peat moss, pressed fibres, papier-mâché,  
or other biodegradable material such that the containers containing the  
10           seedlings are normally transplanted with the plant and let in the ground to  
disintegrate and to add to the fibre content of the soil about the root system  
of the plant.

          Seedling pots are typically found in gardening supply stores, and are  
relatively expensive. Also, it is common that when comes the planting  
15           time, one has not purchased a sufficient quantity of pots for the amount of  
seeds that one ultimately wants to plant. The hand tool and method of the  
present invention are advantageous in that one can use newsprint, paper or  
other types of sheet material to readily and inexpensively manufacture  
seedling pots that meet the requirements of common plant species.



A number of paper containers have been developed in the past to germinate seeds. Examples of these containers are described in the following documents:

- US Patent **404,585**, issued on June 4, 1889 to W.L. Wright;
- 5 US Patent **1,828,448**, issued on Oct. 20, 1931 to G.M. Seidel;
- US Patent **2,033,627**, issued on Mar. 10, 1936 to C.E. Gardner;
- US Patent **2,079,116**, issued on May 4, 1937 to C.E. Gardner;
- GB Patent **563,552**, issued on Aug. 18, 1944 to E.A. Ingold.

10 Although the containers of the prior art deserve undeniable merits,  
it is believed that the prior inventions do not suggest any tool nor a method  
for easily forming cylindrical paper seedling pots by hand, without using  
adhesive or other fastener. As such, it will be appreciated that there  
continues to be a need for a simple hand tool and a method, which can be  
used by professional growers as well as by the hobby gardeners, for easily  
15 making seedling pots of various sizes and thicknesses, using paper material  
as common as newsprint.

## **SUMMARY OF THE INVENTION**

The present invention provides for a hand tool and a method for  
manually making cylindrical paper containers that have overlapping and  
20 interlocking flaps, stiff rims, selective thicknesses and strong bottom  
structures. Furthermore, the containers according to the present invention  
retain their shape without tape, adhesive or other fastener.

Broadly, in a first aspect of the present invention, there is provided a hand tool for forming cylindrical paper containers. This hand tool comprises a cylindrical body having a diameter, a closed end and an open end, and a handle mounted on the closed end. The hand tool also has a cavity extending inside the cylindrical body from the open end.

The hand tool according to this aspect of the present invention is particularly appreciable for use with sheet material for easily and quickly forming cylindrical containers. The sheet material can be wrapped around the cylindrical body and a portion of the sheet material near the open end of the cylindrical body can be twisted, tufted up and pushed inside the cavity for forming a cylindrical container having a closed and relatively flat bottom end.

In accordance with another aspect of the present invention, there is provided a cylindrical container made of sheet material and comprising an open end, a bottom end, a rim circling the open end, a vertical dimension and a seam along the vertical dimension. The seam comprises an overlap in the sheet material. The bottom end comprises a twisted, tufted and flattened portion of the sheet material. The cylindrical container also has a fold around the rim, and this fold encloses the overlap crosswise for retaining the overlap and retaining the shape of the container. One of the advantageous features of this cylindrical container is that a sturdiness thereof is obtained without adhesive nor fastener.

In accordance with yet another aspect of the present invention, there is provided a method for manually forming a cylindrical paper container. This method comprises the steps of:



- A) providing a hand tool comprising a cylindrical body having a length, a diameter, a closed end and an open end, a handle mounted to the closed end and a cavity extending inside the cylindrical body from the open end;
- 5 B) providing a rectangular sheet of paper having a height of about twice the length of the cylindrical body and a width of about one third more than a circumference of the cylindrical body;
- C) forming a fold in the sheet of paper with a fold line extending across the width of the sheet;
- 10 D) cutting the fold along the height of the sheet in a third-region of the fold and unfolding a segment of the fold about the fold line;
- E) placing the fold against the cylindrical body and aligning the fold line with the closed end of the cylindrical body;
- F) wrapping the sheet of paper around the cylindrical body, with the  
15 width of the sheet of paper extending around the cylindrical body thereby forming a paper cylinder having an overlapped seam;
- G) while holding the paper cylinder to the cylindrical body, twisting a portion of the sheet of paper extending beyond the cylindrical body and forming a tuft of paper with this portion;
- 20 H) pushing the tuft of paper inside the cavity in the cylindrical body, thereby defining a closed end to the paper cylinder;
- I) pulling the hand tool from the paper cylinder, and
- J) folding the segment of the fold about the fold line and over the overlapped seam to enclose the overlapped seam crosswise and to  
25 define an interlocking rim to that paper cylinder.

This method is advantageous for easily forming cylindrical paper containers by hand without adhesive nor fastener. The paper containers are formable with a simple tool and with readily available paper sheets. When the paper containers are used as seedling pots, the above method is

particularly advantageous for fabricating the seedling pots as needed at the planting time, thereby partly eliminating inventories or conventional advance procurement of seedling supplies.

5 Still another feature of the invention is that the hand tool used to manufacture the seedling pots is susceptible of a low cost of manufacture with regard to materials and labour, and which accordingly is then susceptible of low price of sale to the industry, thereby making such hand tool economically available to the public.

10 Other advantages and novel features of the invention will become apparent from the following detailed description.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

A preferred embodiment of the present invention selected by way of an example will now be described with reference to the accompanying drawings in which:

15 **FIG. 1** illustrates a first tool for making cylindrical containers of a relatively small diameter;

**FIG. 2** is a perspective view of the preferred hand tool for making cylindrical containers of average diameter for use in common horticultural applications;

20 **FIG. 3** illustrates a side view of the preferred hand tool for making cylindrical containers according to the preferred embodiment of the present invention;

**FIG. 4** is a side perspective view of a second tool for making cylindrical containers having a relatively large diameter;

5 **FIG. 5** illustrates a layout of a paper sheet used for making a cylindrical container according to the preferred embodiment of the present invention;

**FIG. 6** illustrates one of the early steps in a preferred method for forming a cylindrical container according to the preferred embodiment of the present invention;

10 **FIG. 7** illustrates an intermediate step in a preferred method for forming a cylindrical container according to the preferred embodiment of the present invention;

**FIG. 8** illustrates a final step in a preferred method for forming a cylindrical container according to the preferred embodiment of the present invention.

## 15 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Although the preferred embodiment of this invention comprises cylindrical containers made of sheet material, the present invention also comprises a preferred method and a preferred hand tool for making these containers. It will be appreciated that this invention is susceptible of other  
20 embodiments in many various forms, and therefore the present disclosure is to be considered as an example of the principles of the invention and is not intended to limit the invention to the embodiment illustrated.



Reference will firstly be made to **FIGS. 1 to 4** illustrating the preferred hand tool and two variants thereof for manually forming cylindrical containers according to the preferred embodiment of the present invention, often referred to herein as seedling pots. Although seedling  
5 pots are mentioned throughout this description of the preferred embodiment, it will be appreciated that a variety of other cylindrical containers are manufacturable using the tools and method described herein.

The preferred hand tool is illustrated in **FIGS. 2 and 3**. This hand  
10 tool is hereinafter referred to as a mold **20**, and comprises a cylindrical hollow body **22** with an opened end **24**, a closed end **26** and a knob handle **28** mounted to the closed end **26**. The depth 'A' of the cavity **30** inside the body **22** is about half of the diameter of the body. In the preferred hand tool, the depth 'A' is about 7/8 inch (22 mm), and the diameter of the  
15 cylindrical body is about 1-3/4 inches (44 mm). The mold **20** is preferably made of wood, plastic or similar rigid material.

A first variant **40** of the mold **20** comprises a tubular member **42** having a piston **44** mounted therein. The piston **44** is connected to a rod **46** and the rod is connected to a knob **48**. The piston **44** is urged toward  
20 the closed end of the tubular member by a spring **50** mounted over the rod **46**. The tubular member **42** is preferably made of transparent material and preferably has spaced-apart lines **52** printed thereon. The lines **52** are advantageous for providing guiding marks for forming containers of various depths as will be explained later. This first variant **40** of the tool  
25 is advantageous for simultaneously forming a seedling pot over the tubular member **42** that has been previously filled with planting soil, and for filling the seedling pot with the soil before withdrawing the formed pot from the

tool. As one will appreciate, the piston **44** is also advantageous for assisting in the pushing out of the formed container from over the tubular member **42**.

5 The tubular member **42** of the tool **40** in this variant is substantially smaller than the cylindrical body **22** of the preferred mold **20**. The tool **40** of the first variant is intended to form silviculture-type paper pots for placement in common silviculture starting trays.

A second variant **60** of the preferred hand tool is shown in **FIG. 4**. The cylindrical mandrel **62** of this variant is substantially larger than the  
10 cylindrical body **22** of the mold **20**. The mandrel of the second variant preferably has a diameter of about 4 inches (102 mm) and a height of about 6 inches (152 mm) for forming larger gardening-type planting pots for examples. The cylindrical mandrel **62** is preferably made of paperboard tubing. A rigid cap **64** made of wood, plastic or the like is also provided  
15 for covering one end of the mandrel **62**, when soil or other plant growing media has been placed inside the mandrel **62** prior to forming a container thereon for example. As one can appreciate, the cap **64** is a removable cap such that potting soil may be introduced inside a container, while the container is still mounted to the mandrel **62**. Circumferential guide lines  
20 **66** are also provided on the mandrel **62** for assisting in forming containers of different depths.

It will also be appreciated that the features of one of the described variants are applicable to the other variant, and to the preferred mold **20**, and vice-versa. In other words, the diameter of the preferred mold **20** may  
25 vary for example from 1 inch to 4 inches or more and the cylindrical body **22** may also have guide marks thereon.



Referring now to **FIGS. 5-8**, there is illustrated therein a preferred method for manufacturing cylindrical containers according to the preferred embodiment of the present invention. The base material for manufacturing the containers is any sheet material **70** and preferably newsprint, or another sheet of paper. One or more layers may be used according to the purpose and required strength of the container.

The sheet **70** is preferably cut to a height '**B**' corresponding to at least about twice as much as the depth of the container to be formed. The width '**C**' of the sheet **70** is preferably the circumference '**D**' of the container to be formed plus at least about 30%. An overlap of at least about one third of the container is thereby provided for securely retaining growing media inside the container. It will be appreciated that the dimension of this overlap may vary according to the purpose of the container and the type of material to be contained inside the container.

A fold **72** is formed along the top edge of the sheet, for making a double thickness at top edge and reinforcing the rim **74** of the container being formed. The suggested height '**E**' of this fold **72** is between about 1/4 inch (6 mm) to 1-1/2 inches (38 mm) for containers having diameters varying from 1 inch (25 mm) to 4 inches (102 mm) respectively. A portion of this fold **72** is cut or torn vertically at lines **76** and folded back straight up about the fold line **74'**, thereby forming a flap segment **78** extending above the rim **74** of the container to be formed. The width '**F**' of the flap is preferably about one third or slightly more of the full width '**C**' of the sheet **70**, such that the starting vertical edge **80** of the sheet **70** coincides with approximately a central region **80'** of the flap segment **78** when the container is formed.



The forming of a container according to the preferred embodiment is illustrated in **FIGS. 6-8**. The sheet **70** is wrapped around the mold **20**, with the top edge **74**, or the rim of the sheet aligned with the closed end **26** of the mold **20**. When using a mold having guide lines printed thereon, the top edge **74** may be aligned with one of the guide lines according to the required depth of the container. The sheet **70** is wrapped and held tight around the mold **20**, with the starting vertical edge **80** set against the cylindrical body, straight along the height of the mold **20**.

The bottom edge **82** of the sheet extending beyond the cylindrical body **22** is then pinched and twisted. The twisted tuft **84** is pushed into the cavity **30** of the mold and flattened even with the bottom edge **82** of the container as shown in **FIGS. 6** and **7**. The dimension 'A' mentioned above has been found to be convenient for receiving the twisted tuft of material on the bottom of the container made with the mold **20**.

The mold **20** is then twisted out of the formed container **86**, as shown by arrow **88** in **FIG. 7**, while holding the container **86** in one's hand. The arrow **88** shows a twisting motion in the direction of the wrapping of the sheet, which direction tends to expand the container **86** to facilitate the removal of the mold **20** therefrom.

At this stage, the flap segment **78** is folded inside the container to overlap the vertical edge **80**, to overlap the fold **72**, to reinforce the rim member **74** and to prevent the container from opening out of shape. The container **86** thus formed is relatively sturdy, has good circumferential strength, can be set straight on a flat surface and can be used for a multitude of applications including the planting of seeds.

The container **86** according to the preferred embodiment does not contain metal fastener or adhesive. When the container **86** is made with newsprint or uncoated paper for example, it is entirely biodegradable and is particularly advantageous for applications requiring a single use.

While one embodiment of the present invention has been described herein above, it will be appreciated by those skilled in the art that various modifications, alternate materials, shapes and equivalents may be employed without departing from the true spirit and scope of the invention. Therefore, the above description and illustrations should not be construed as limiting the scope of the invention which is defined by the appended claims.

## CLAIMS

I claim:

1. A cylindrical container made of sheet material, comprising:  
a diameter, an open end, a closed bottom end, a rim circling said open end, an inward fold around said rim, a vertical dimension and a seam along said vertical dimension; said seam comprising an overlap in said sheet material; said fold having a cut therein along said vertical dimension adjacent said seam; said cut defining a flap segment in said fold; and said flap segment overlapping a portion of said fold for reinforcing said rim.
2. The cylindrical container as claimed in **claim 1**, wherein said overlap represents one third of a circumference thereof.
3. The cylindrical container as claimed in **claim 1**, wherein said diameter is between 1 inch and 4 inches and a height of said fold is between 1/4 inch to 1-1/2 inches.
4. The cylindrical container as claimed in **claim 1**, wherein said closed bottom end comprises a twisted and flattened tuft of said sheet material.
5. The cylindrical container as claimed in **claim 1**, wherein a length of said flap segment is twice as much as a width of said overlap.
6. The cylindrical container as claimed in **claim 1**, wherein a height of said sheet material is twice as long as said vertical dimension.



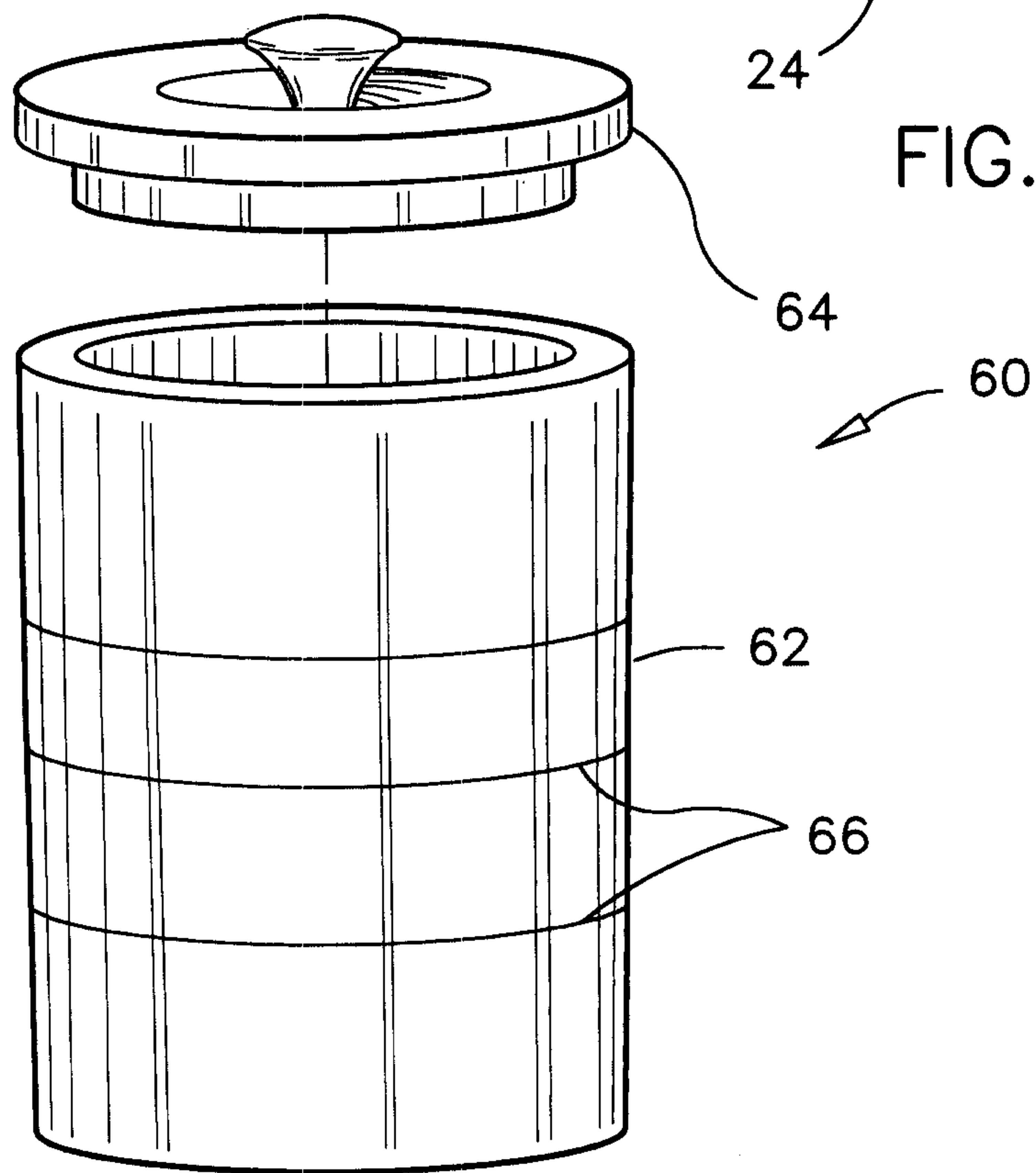
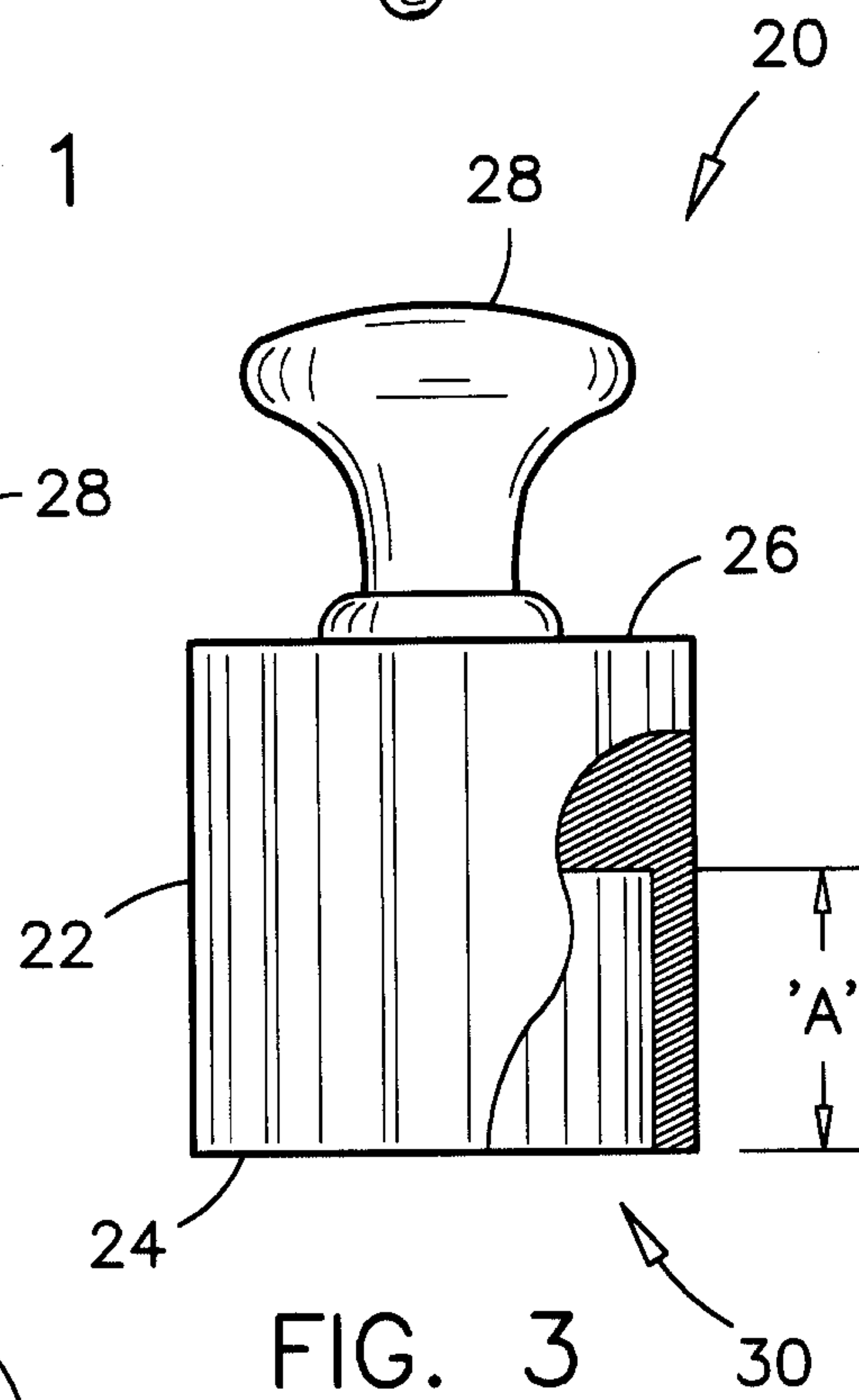
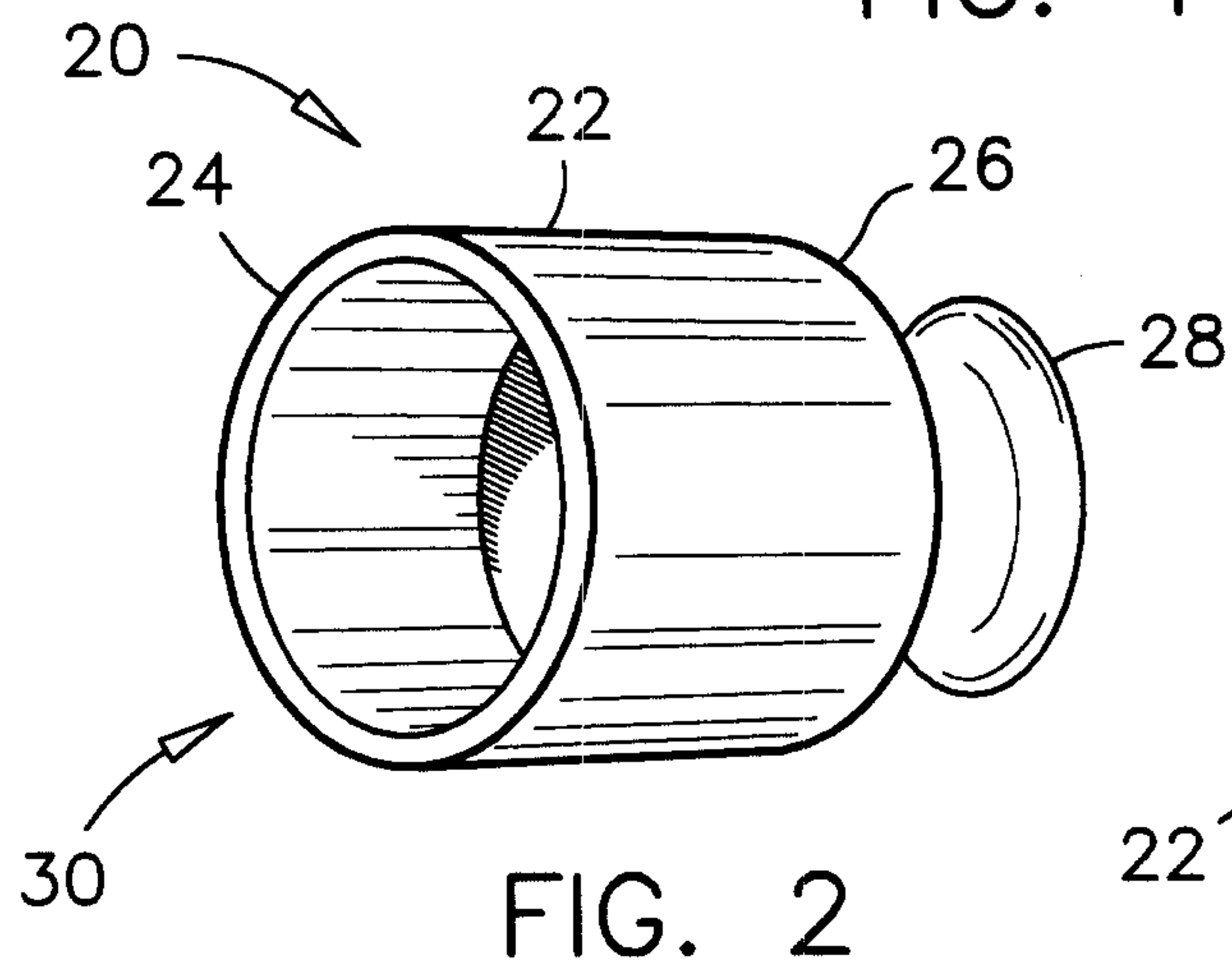
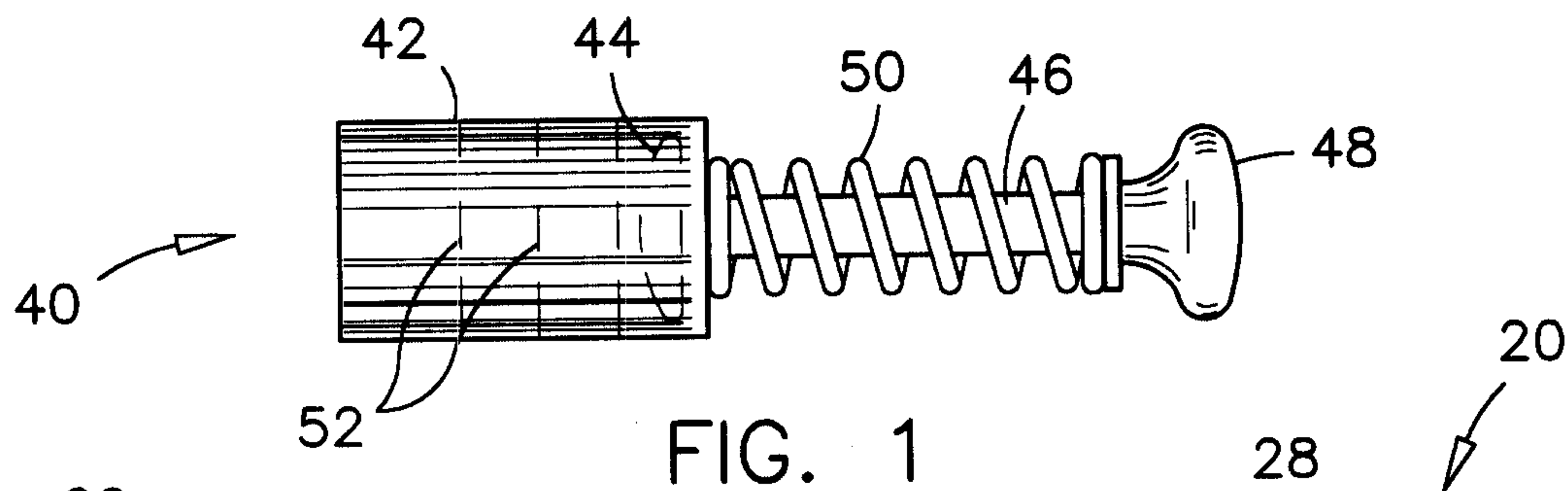
7. The cylindrical container as claimed in **claim 1**, wherein said sheet material comprises several layers of paper.
8. A hand tool for forming cylindrical paper containers, comprising:  
a cylindrical body having a diameter, a closed end and an open end;  
a handle mounted on said closed end, and  
a cavity extending inside said cylindrical body from said open end;  
such that a sheet material can be wrapped around said cylindrical body and a portion of said sheet material near said open end can be twisted, tufted up and pushed inside said cavity for forming a cylindrical container having a closed and flat bottom end.
9. The hand tool as claimed in **claim 8**, wherein a depth of said cavity from said open end is half of said diameter of said cylindrical body.
10. The hand tool as claimed in **claim 9** wherein said diameter of said cylindrical body is 1-3/4 inches.
11. The hand tool as claimed in **claim 8**, wherein said cylindrical body is made of wood.
12. The hand tool as claimed in **claim 8**, wherein said handle is a knob handle.
13. The hand tool as claimed in **claim 8**, wherein said diameter of said cylindrical body is between 1 inch and 4 inches.
14. The hand tool as claimed in **claim 8**, further comprising a circumferential marking line on said cylindrical body.

15. A method for manually forming a cylindrical paper container, comprising the steps of:
- providing a cylindrical hand tool comprising a cylindrical body having a length, a diameter, a closed end and an open end, a handle mounted to said closed end, and a cavity extending inside said cylindrical body from said open end;
  - providing a rectangular sheet of paper having a height of twice said length of said cylindrical body and a width of one third more than a circumference of said cylindrical body;
  - forming a fold in said sheet of paper, said fold having a fold line extending across said width;
  - cutting said fold along said height in a third-region of said fold and unfolding a segment of said fold along said fold line;
  - placing said fold against said cylindrical body and aligning said fold line with said closed end of said cylindrical body;
  - wrapping said sheet of paper around said cylindrical body, with said width of said sheet of paper extending around said cylindrical body, thereby forming a paper cylinder having an overlapped seam;
  - while holding said paper cylinder to said cylindrical body, twisting a portion of said sheet of paper extending beyond said cylindrical body and forming a tuft of paper with said portion;
  - pushing said tuft of paper in said cavity in said cylindrical body, thereby defining a closed end to said paper cylinder;
  - pulling said hand tool from said paper cylinder, and
  - folding said segment along said fold line over said fold thereby enclosing a portion of said fold and defining a reinforced rim to said paper cylinder.
16. The method as claimed in **claim 15**, wherein a length of said segment is twice as much as a width of said overlapped seam.

17. The method as claimed in **claim 16**, wherein said diameter of said cylindrical body is between 1 inch and 4 inches, and a height of said fold is between 1/4 inch and 1-1/2 inches.
18. The method as claimed in **claim 15**, wherein said step of pulling said hand tool from said paper cylinder comprises the additional step of turning said hand tool relative to said paper cylinder.
19. The method as claimed in **claim 18**, wherein said step of turning said hand tool relative to said paper cylinder also comprises the step of turning said hand tool relative to said paper cylinder in a same direction as a wrapping of said sheet of paper around said cylindrical body.
20. The method as claimed in **claim 15**, wherein said step of providing a rectangular sheet of paper comprises the step of providing a rectangular sheet made of several layers of paper.

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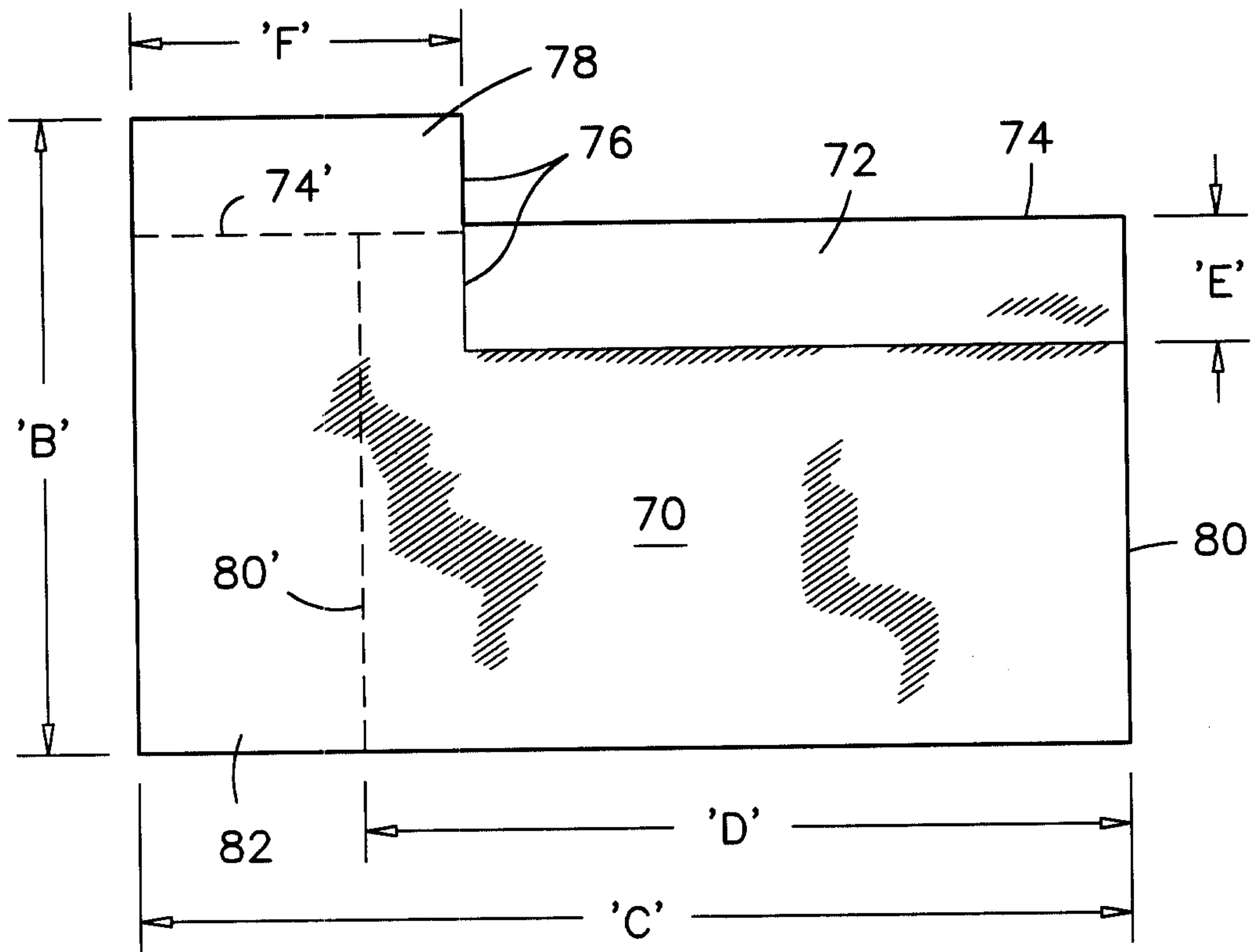


FIG. 5

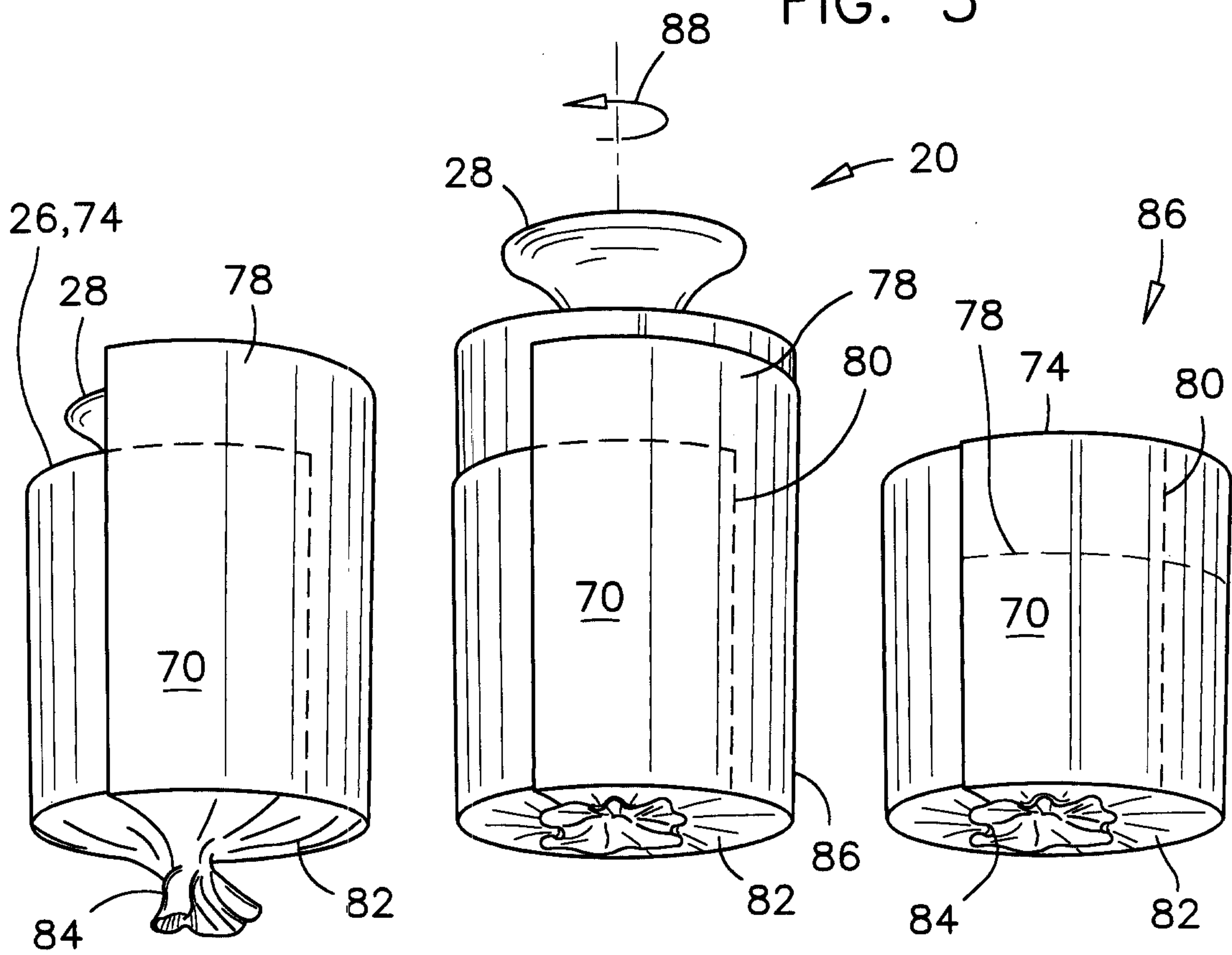


FIG. 6

FIG. 7

FIG. 8

