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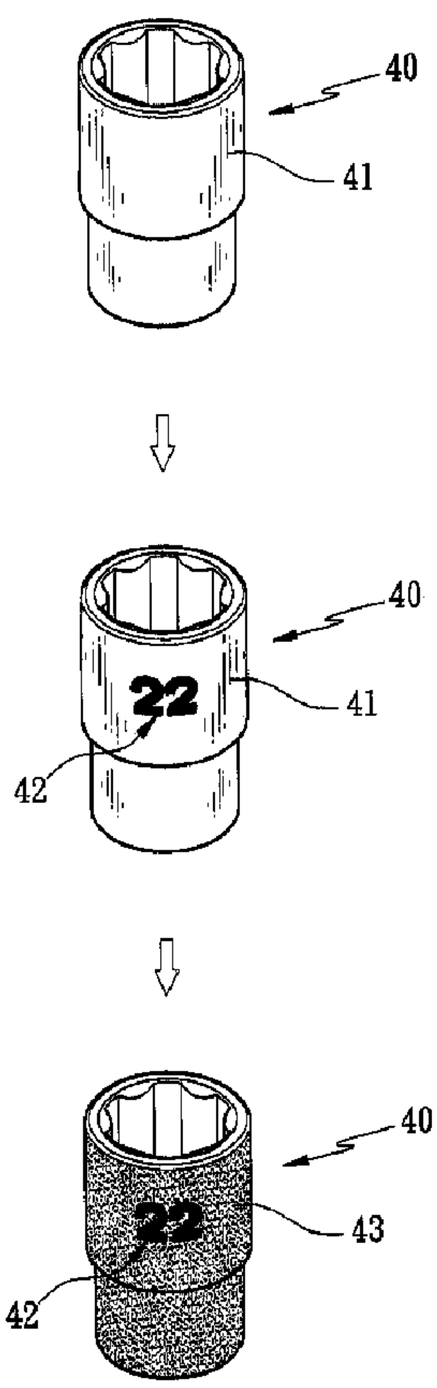
(54) Titre : PROCEDE DE FORMATION D'UNE STRUCTURE DE MARQUAGE D'OUTIL
(54) Title: METHOD OF FORMING TOOL MARKING STRUCTURE



(57) Abrégé/Abstract:
A method of forming a tool marking structure includes: a coloring step of coloring a predetermined position of the first protective layer so as to form a marking area with a color layer and forming the first protective layer on a bottom surface of the marking area, and a second-time surface processing step of forming a second protective layer on a non-marking area of the tool.

Abstract

A method of forming a tool marking structure includes: a coloring step of coloring a predetermined position of the first protective layer so as to form a marking area with a color layer and forming the first protective layer on a bottom surface of the marking area, and a second-time surface processing step of forming a second protective layer on a non-marking area of the tool.

METHOD OF FORMING TOOL MARKING STRUCTURE

FIELD OF THE INVENTION

The present invention relates to a method of forming a tool marking structure which is capable of clearly distinguishing the size of a tool and obtaining an anti-rust function even though the color layer of the marking area of the tool is rubbed.

BACKGROUND OF THE INVENTION

As shown in FIG. 1, a conventional method of forming a tool marking structure which comprises: electroplating a tool **10** so as to form a plating layer **11** on the tool **10**, and printing colorful patterns **12** on a surface of the tool **10**. However, when the colorful patterns **12** are rubbed after a long period of use, the color of the plating layer **11** is revealed, therefore the colorful patterns **12** can no longer be viewed and distinguished.

Referring further to FIG. 2, another conventional method of forming a tool marking structure which comprises: imprinting a tool **20** so that concave patterns **21** are formed on the tool **20**, and printing a color layer on the concave patterns **21**; thereafter electroplating the tool **20** so that the surface of the tool **20** outside the concave patterns **21** has a plating layer **22**. In the plating process, a plating layer cannot be formed on a bottom surface or on the surface of the color layer, so when the color layer is rubbed, the concave patterns **21** rust badly.

With reference to FIG. 3, another conventional method of forming a tool marking structure which comprises: electroplating a

tool **30** so as to form a plating layer **31** on the tool **30**, imprinting concave patterns **32** at a predetermined position of the tool **30**; thereafter printing a color layer on the concave patterns **32**. Although the color layer of the concave patterns **32** is rubbed after a long period of use, the concave patterns **32** are revealed and have the plating layer **31** formed on a bottom surface thereof. The colors of the plating layers **31** of the concave patterns **32** and the tool **30** are the same, so the concave patterns **32** cannot be clearly distinguished.

The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

SUMMARY OF THE INVENTION

In aspect of the invention, there is provided a method of forming a tool marking structure which is capable of distinguishing the size of a tool clearly and obtaining an anti-rust function even though the color layer of the marking area of the tool is rubbed.

To obtain this, a method of forming a tool marking structure provided by the present invention comprises:

a first-time surface processing step including forming a first protective layer on a tool;

a coloring step including coloring a predetermined position of the first protective layer so as to form a marking area with a color layer, and forming the first protective layer on a bottom surface of the marking area;

a second-time surface processing step of forming a second

protective layer on a non-marking area of the tool.

Thereby, when the color layer of the marking area is rubbed after a long period of use, because the bottom surface of the marking area has the first protective layer electroplated thereon, the tool till has an rustproof effect by ways of the first protective layer. Likewise, after the color layer of the marking area is rubbed, the color of the first protective layer is visible and is identical to that of the second protective layer of the non-marking area. But because a thickness of the second protective layer is higher than that of the first protective layer, the user identifies the tool by using a height difference between the second protective layer and the first protective layer.

Another method of forming a tool marking structure provided by the present invention contains:

a first-time surface processing step including forming a first protective layer on a tool;

a coloring step including coloring a predetermined position of the first protective layer so as to form a marking area with a color layer, wherein the marking area has a first color area and a second color area, and the color of the first color area is different from that of the second color area, additionally a spacing area without any color layer is defined between the first color area and the second color area, and two bottom surfaces of the color first area and the second color area have the first protective layer;

a second-time surface processing step of forming a second

protective layer in a non-marking area of the tool and the spacing area.

Thereby, when colors of the first color area and the second color area of the marking area are rubbed after a long period of use, the two bottom surfaces of the color first area and the second color area will have the first protective layer electroplated thereon, so the tool still has an rustproof effect by ways of the first protective layer. Likewise, after the colors of the first color area and the second color area of the marking area are rubbed, the color of the first protective layer is visible and is identical to that of the second protective layer of the non-marking area. But because a thickness of the second protective layer of the non-marking area and the spacing area is higher than that of the first protective layer, the user identifies the tool by using a height difference between the second protective layer of the non-marking area and the spacing area and the first protective layer.

The foregoing, as well as additional features and advantages of the invention will be more readily apparent from the following detailed description, which proceeds with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a conventional method of forming a first tool marking structure.

FIG. 2 is a perspective view of a conventional method of

forming a second tool marking structure.

FIG. 3 is a perspective view of a conventional method of forming a third tool marking structure.

FIG. 4 is a flow chart of a method of forming a tool marking structure according to a first embodiment of the present invention.

FIG. 5 is a perspective view showing a tool marking structure according to the first embodiment of the present invention.

FIG. 6 is a perspective view showing the tool marking structure is used after a long period of using time according to the first embodiment of the present invention.

FIG. 7 is a perspective view showing a tool marking structure according to a second embodiment of the present invention.

FIG. 8 is a perspective view showing the tool marking structure is used after a long period of using time according to the second embodiment of the present invention.

FIG. 9 is a perspective view showing a tool marking structure according to a third embodiment of the present invention.

FIG. 10 is a perspective view showing the tool marking structure is used after a long period of using time according to the third embodiment of the present invention.

FIG. 11 is a perspective view showing a tool marking structure according to a fourth embodiment of the present invention.

FIG. 12 is a perspective view showing the tool marking

structure is used after a long period of using time according to the fourth embodiment of the present invention.

FIG. 13 is a flow chart of a method of forming a tool marking structure according to a fifth embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to FIGS. 4 and 5, a method of forming a tool marking structure, such as a sleeve tool, according to a first embodiment of the present invention which comprises: a first-time surface processing step including forming a first protective layer **41** on a tool **40**, wherein the first-time surface processing step is an electroplating means, an electrodeposition means, an air dyeing means, or a blackening means. In this embodiment, the first-time surface processing step is an electroplating means. For example, electroplating the tool **40** so as to form the first protective layer **41** which then a coloring step including coloring a predetermined position of the first protective layer **41** so as to form a marking area **42** with a color layer is performed. The coloring step is a printing means or an affixing means. In this embodiment, the coloring step includes printing the marking area **42** and forming the first protective layer **41** on a bottom surface of the marking area **42**, and then forming a second protective layer **43** on a non-marking area of

the tool **40**, wherein a color of the second protective layer **43** is different from that of the first protective layer **41**. The second-time surface processing step is an electroplating means, an electrodeposition means, or a blackening means. In this embodiment, the second-time surface processing step is an electroplating means, because it is an electroplating means the marking area **42** does not cause a plating reaction. The plating reaction only occurs in the non-marking area; the non-marking area of the tool **40** is electroplated to form the second protective layer **43**. In addition, due to the electroplating means; copper plating, chrome plating, or nickel plating may be utilized, wherein different platings will produce a plurality of protective layers with different colors. Accordingly, while applying a plating in the second-time surface processing step different from the first-surface processing step, the color of the second protective layer **43** is different from that of the first protective layer **41**. Also, a color of the second protective layer **43** is different from that of the color layer of the marking area **42** so that a color contrast is produced between the marking area **42** and the second protective layer **43** of the non-marking area of the tool **40**, thus obtaining obvious identification effect.

Referring further to FIG. 6, when the color layer of the marking area **42** is rubbed after a long period of use, the bottom surface of the color layer of the marking area **42** has the first

protective layer **41** electroplated thereon, so the tool **40** still has rustproof effect by ways of the first protective layer **41**. Likewise, because the color of the first protective layer **41** is different from that of the second protective layer **43**, the user identifies the tool **40** by using the color contrast between the first protective layer **41** and the second protective layer **43**.

Referring further to FIGS. 4 and 7, a method of forming a tool marking structure, such as a sleeve tool, according to a second embodiment of the present invention which comprises: a first-time surface processing step including forming a first protective layer **41** on a tool **40**, wherein the first-time surface processing step is an electroplating means, an electrodeposition means, an air dyeing means, or a blackening means. In this embodiment, the first-time surface processing step is the electroplating means. For example, electroplating the tool **40** so as to form the first protective layer **41**, which then a coloring step including coloring a predetermined position of the first protective layer **41** so as to form a marking area **42** with a color layer is performed. The coloring step is a printing means or an affixing means. In this embodiment, the coloring step includes printing the marking area **42** and forming the first protective layer **41** on a bottom surface of the marking area **42**, wherein the marking area **42** has a first color area **421** and a second color area **422**, and a color of the first color area **421** is different

from that of the second color area **422**. Additionally a spacing area **423** without any color layer is defined between the first color area **421** and the second color area **422**. In the second-time surface processing step, a second protective layer **43** is formed in a non-marking area of the tool **40** and the spacing area **423**, wherein a color of the second protective layer **43** is different from that of the first protective layer **41**. The second-time surface processing step is an electroplating means, an electrodeposition means, or a blackening means. In this embodiment, the second-time surface processing step is an electroplating means, and because in an electroplating step, the first color area **421** and the second color area **422** of the marking area **42** do not cause a plating reaction, but the plating reaction only occurs in the non-marking area and the spacing area **423**. The non-marking area and the spacing area **423** of the tool **40** are electroplated to form the second protective layer **43**. In addition, due to the electroplating means; copper plating, chrome plating, or nickel plating may be utilized, wherein different platings will produce a plurality of protective layers with different colors. Accordingly, while applying plating in the second-time surface processing step, the color of the second protective layer **43** is different from that of the first protective layer **41**. Also, the color of the second protective layer **43** is different from those of the first

color area **421** and the second color area **422** of the marking area **42** so that three color contrasts produce among the first color area **421** of the marking area **42**, the second color area **422** of the marking area **42**, and the second protective layer **43** of the non-marking area and the spacing area **423**, thus obtaining obvious identification effect.

Referring further to FIG. 8, when colors of the first color area **421** and the second color area **422** of the marking area **42** are rubbed after a long period of use, the two bottom surfaces of the color first area **421** and the second color area **422** will have the first protective layer **41** electroplated thereon, so the tool **40** still has an rustproof effect by ways of the first protective layer **41**. Likewise, after the colors of the first color area **421** and the second color area **422** of the marking area **42** are rubbed, the color of the first protective layer **41** is visible to the user, and the color of the spacing area **423** is identical to that of the second protective layer **43**. Since the color of the first protective layer **41** is different from that of the second protective layer **43**, the user identifies the tool **40** by using the color contrast between the first protective layer **41** and the second protective layer **43**.

As shown in FIGS. 4 and 9, a difference of a method of forming a tool marking structure of a third embodiment from that of the first embodiment of the present invention comprises: a color of

a second protective layer is identical to that of a first protective layer. The method of forming the tool marking structure, such as a sleeve tool, according to the third embodiment of the present invention which comprises: a first-time surface processing step including forming a first protective layer **41** on a tool **40,** wherein the first-time surface processing step is an electroplating means, an electrodeposition means, an air dyeing means, or a blackening means. In this embodiment, the first-time surface processing step is the electroplating means. For example, electroplating the tool **40** so as to form the first protective layer **41**, then a coloring step including coloring a predetermined position of the first protective layer **41** so as to form a marking area **42** with a color layer. The coloring step is a printing means or an affixing means. In this embodiment, the coloring step includes printing the marking area **42** and forming the first protective layer **41** on a bottom surface of the marking area **42,** thereafter a second-time surface processing step is executed, wherein the second-time surface processing step includes forming a second protective layer 43 on a non-marking area of the tool, and a color of the second protective layer 43 is identical to that of the first protective layer 41. The second-time surface processing step is an electroplating means, an electrodeposition means, or a blackening means. In this embodiment, the second-time surface processing step is an

electroplating means so that the marking area **42** does not cause a plating reaction. The plating reaction only occurs in the non-marking area, and the non-marking area of the tool **40** is electroplated to form the second protective layer **43**. Thereby, a color of the color layer of the marking area **42** is different from that of the second protective layer **43** so that a color contrast is produced between the marking area **42** and the second protective layer **43** of the non-marking area of the tool **40**, thus obtaining obvious identification effect.

Referring further to FIG. 10, when the color layer of the marking area **42** is rubbed after a long period of use, because the bottom surface of the marking area **42** has the first protective layer **41** electroplated thereon, the tool **40** still has an rustproof effect by ways of the first protective layer **41**. Likewise, after the color layer of the marking area **42** is rubbed, the color of the first protective layer **41** is visible and is identical to that of the second protective layer **43** of the non-marking area. But because a thickness of the second protective layer **43** is higher than that of the first protective layer **41**, the user identifies the tool **40** by using a height difference between the second protective layer **43** and the first protective layer **41**.

As shown in FIGS. 4 and 11, a difference of a method of forming a tool marking structure of a fourth embodiment from that

of the second embodiment of the present invention comprises: a color of a second protective layer is identical to that of a first protective layer. The method of forming the tool marking structure, such as a sleeve tool, according to the fourth embodiment of the present invention which comprises: a first-time surface processing step including forming a first protective layer **41** on a tool **40**, wherein the first-time surface processing step is an electroplating means, an electrodeposition means, an air dyeing means, or a blackening means. In this embodiment, the first-time surface processing step is the electroplating means. For instance, electroplating the tool 40 so as to form the first protective layer 41, then a coloring step including coloring a predetermined position of the first protective layer **41** so as to form a marking area **42** with a color layer. The coloring step is a printing means or an affixing means. In this embodiment, the coloring step includes printing the marking area **42** and forming the first protective layer **41** on a bottom surface of the marking area **42**, wherein the marking area **42** has a first color area **421** and a second color area **422**, and a color of the first color area **421** is different from that of the second color area **422**. Additionally, a spacing area **423** without any color layer is defined between the first color area **421** and the second color area **422**. Thereafter, in a second-time surface processing step, a second protective layer **43** is formed in a non-marking area of the tool **40**

and the spacing area **423**. The second-time surface processing step is an electroplating means, an electrodeposition means, or a blackening means. In this embodiment, the second-time surface processing step is an electroplating means, and in an electroplating step, the first color area **421** and the second color area **422** of the marking area **42** do not cause a plating reaction, but the plating reaction only occurs in the non-marking area and the spacing area **423**. Also, the color of the second protective layer **43** is different from those of the first color area **421** and the second color area **422** of the marking area **42** so that three color contrasts produce among the first color area **421** of the marking area **42**, the second color area **422** of the marking area **42**, and the second protective layer **43** of the non-marking area and the spacing area **423**, thus obtaining obvious identification effect.

Referring further to FIG. 12, when colors of the first color area **421** and the second color area **422** of the marking area **42** are rubbed after a long period of use, the two bottom surfaces of the color first area **421** and the second color area **422** will have the first protective layer **41** electroplated thereon, so the tool **40** still has an rustproof effect by ways of the first protective layer **41**. Likewise, after the colors of the first color area **421** and the second color area **422** of the marking area **42** are rubbed, the color of the first protective layer **41** is visible and is identical to that of the second

protective layer **43** of the non-marking area. But because a thickness of the second protective layer **43** of the non-marking area and the spacing area **423** is higher than that of the first protective layer **41**, the user identifies the tool **40** by using a height difference between the second protective layer **43** of the non-marking area and the spacing area **423** and the first protective layer **41**.

As shown in FIG. 13, a method of forming a tool marking structure according to a fivth embodiment of the present invention is used to prevent any color layer from being rubbed. After the first-time surface processing step, the coloring step, and the second-time surface processing step, a color removing step is executed so as to remove the color layer of the marking area. As illustrated in FIG. 6, after the color layer of the marking structure **42** is removed in the color removing step, the first protective layer **41** is electroplated on a bottom surface of the color layer of the marking area **42**, so even through the color layer of the marking area **42** is removed, the tool **40** still has rustproof effect by ways of the first protective layer **41**. Likewise, because the color of the first protective layer **41** appears after removing the color layer of the marking area **42**, and the color of the first protective layer **41** is different from that of the second protective layer **43** of the non-marking area, the user identifies the tool **40** by using the color contrast between the first protective layer **41** and the second

protective layer **43**. Referring further to FIG. 8, after the color layer of the marking area **42** is removed in the color removing step, because the two bottom surfaces of the color first area **421** and the second color area **422** have the first protective layer **41** electroplated thereon, so that the tool **40** still has rustproof effect by ways of the first protective layer **41**, after the color layer of the first color area **421** and the second color area **422** of the marking area **42** is removed. Likewise, after the color layer of the first color area **421** and the second color area **422** of the marking area **42** is removed, the color of the first protective layer **41** appears. Also, because the color of the first protective layer **41** is different from that of the second protective layer **43** of the non-marking area and the spacing area **423**, the user identifies the tool **40** by using a color contrast between the first protective layer **41** and the second protective layer **43**. Referring to FIG. 10, after the color layer of the marking structure **42** is removed in the color removing step, the first protective layer **41** is electroplated on a bottom surface of the color layer of the marking area **42**, so even through the color layer of the marking area **42** is removed, the tool **40** still has rustproof effect by ways of the first protective layer **41**. It is to be noted that the color of the first protective layer **41** appears after removing the color layer of the marking area **42**, the color of the first protective layer **41** is identical to that of the second protective layer **43** of the

non-marking area, and the thickness of the second protective layer 43 is higher than that of the first protective layer 41, the user identifies the tool **40** by using the height difference between the second protective layer **43** and the first protective layer **41**.

Referring further to FIG. 12, after the color layer of the marking area **42** is removed in the color removing step, because the two bottom surfaces of the color first area **421** and the second color area **422** have the first protective layer **41** electroplated thereon, the tool **40** still has rustproof effect by ways of the first protective layer **41**, after the color layer of the first color area **421** and the second color area **422** of the marking area **42** is removed. Likewise, although the color of the first protective layer **41** is identical to that of the second protective layer **43**, the thickness of the second protective layer **43** of the non-marking area and the spacing area **423** is higher than that of the first protective layer **41**, the user identifies the tool **40** by using the height difference between the second protective layer **43** of the non-marking area and the spacing area **423** and the first protective layer **41**.

While the preferred embodiments of the invention have been set forth for the purpose of disclosure, modifications of the disclosed embodiments of the invention as well as other embodiments thereof may occur to those skilled in the art. Accordingly, the appended claims are intended to cover all

embodiments which do not depart from the spirit and scope of the invention.

WHAT IS CLAIMED IS:

1. A method of forming a tool marking structure comprising:

a first-time surface processing step of forming a first protective layer on a tool;

a coloring step of coloring a predetermined position of the first protective layer so as to form a marking area with a color layer, and forming the first protective layer on a bottom surface of the marking area; and

a second-time surface processing step of forming a second protective layer on a non-marking area of the tool.

2. The method as claimed in claim 1, wherein the first-time surface processing step and the second-time surface processing step are processed by a means selected from a group consisting of an electroplating means, an electrodeposition means, and a blackening means.

3. The method as claimed in claim 2, wherein the electroplating means is capable of processing copper plating, chrome plating, and nickel plating, wherein the second-time surface processing step is processed by an electroplating means different from that of the first-time surface processing step so that a color of the second protective layer is different from that of the first protective layer.

4. The method as claimed in claim 2, wherein the electroplating means is capable of processing copper plating,

chrome plating, and nickel plating, wherein the second-time surface processing step is processed by an electroplating means identical to that of the first-time surface processing step so that a color of the second protective layer is identical to that of the first protective layer.

5. The method as claimed in claim 1, further comprising a color removing step of removing the color layer of the marking area after the first-time surface processing step, the coloring step, and the second-time surface processing step.

6. A method of forming a tool marking structure comprising:

a first-time surface processing step of forming a first protective layer on a tool;

a coloring step of coloring a predetermined position of the first protective layer so as to form a marking area with a color layer, wherein the marking area has a first color area and a second color area, and a color of the first color area is different from that of the second color area, between the first color area and the second color area is defined a spacing area without any color layer, and two bottom surfaces of the color first area and the second color area have the first protective layer; and

a second-time surface processing step of forming a second protective layer in a non-marking area of the tool and the spacing area.

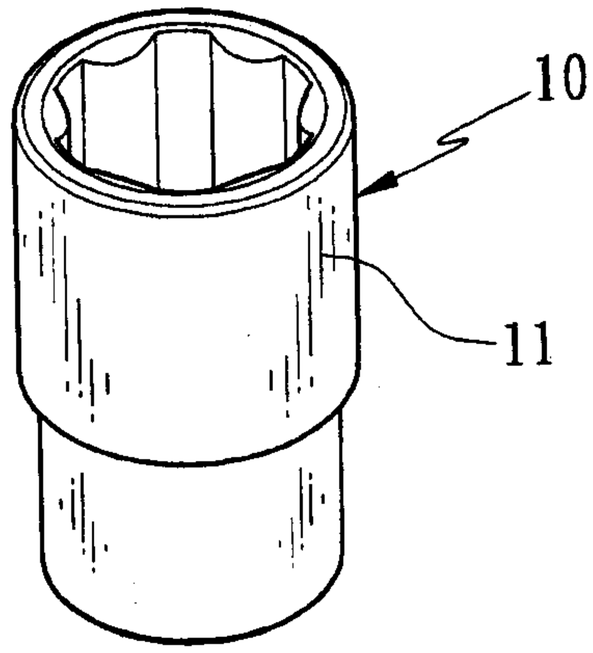
7. The method as claimed in claim 6, wherein the first-time

surface processing step and the second-time surface processing step are processed by a means selected from a group consisting of an electroplating means, an electrodeposition means, and a blackening means.

8. The method as claimed in claim 7, wherein the electroplating means is capable of processing copper plating, chrome plating, and nickel plating, wherein the second-time surface processing step is processed by an electroplating means different from that of the first-time surface processing step so that the color of the second protective layer is different from that of the first protective layer.

9. The method as claimed in claim 7, wherein the electroplating means is capable of processing copper plating, chrome plating, and nickel plating, wherein the second-time surface processing step is processed by an electroplating means identical to that of the first-time surface processing step so that a color of the second protective layer is identical to that of the first protective layer.

10. The method as claimed in claim 6, further comprising a color removing step of removing the color layer of the first color area and the second color area of the marking area after the first-time surface processing step, the coloring step, and the second-time surface processing step.



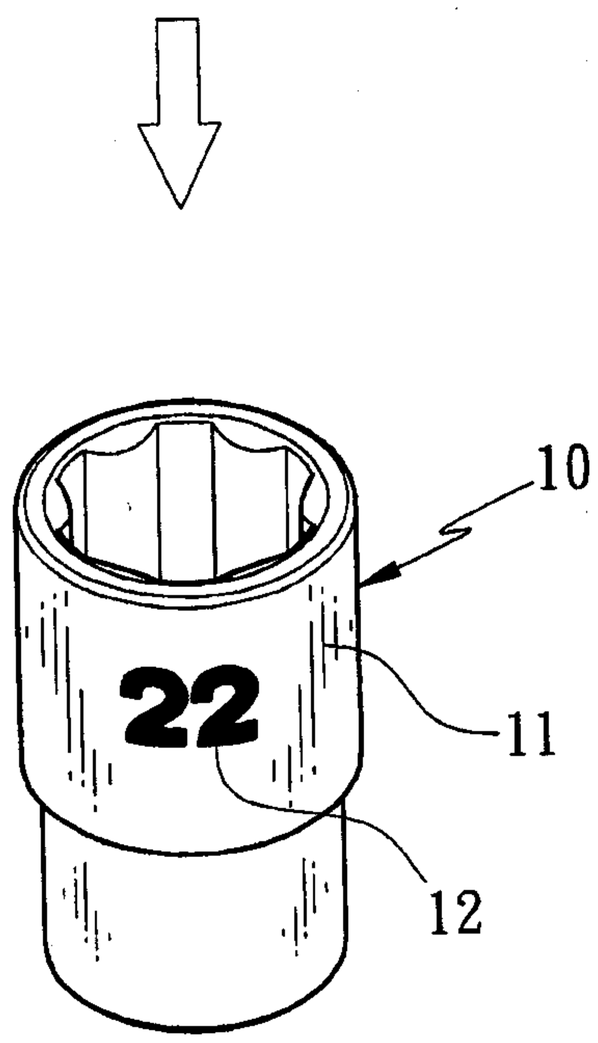


FIG. 1
PRIOR ART

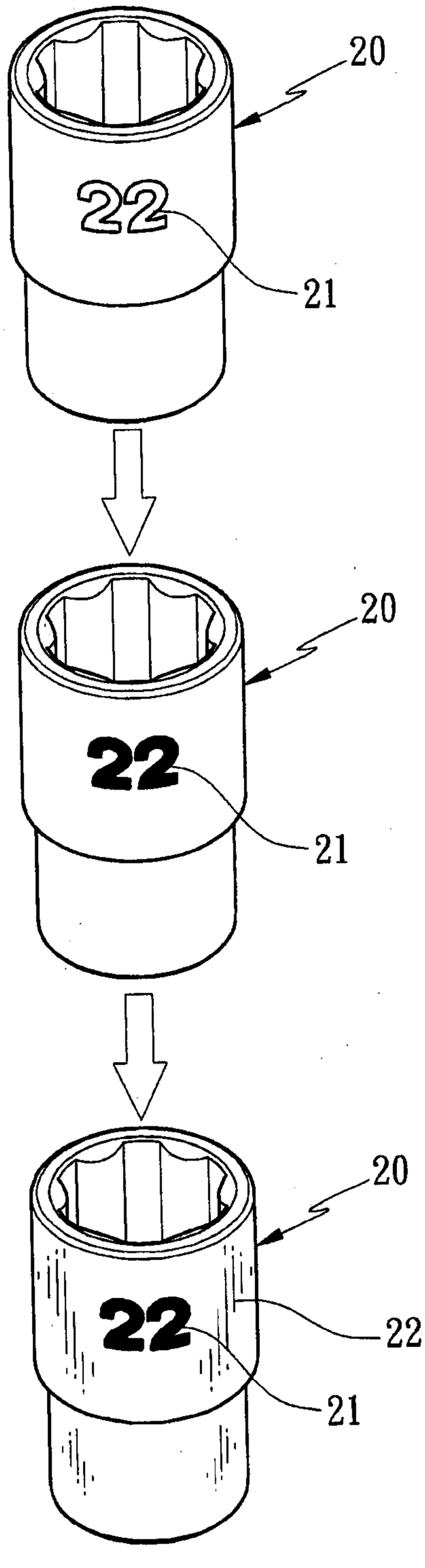


FIG. 2
PRIOR ART

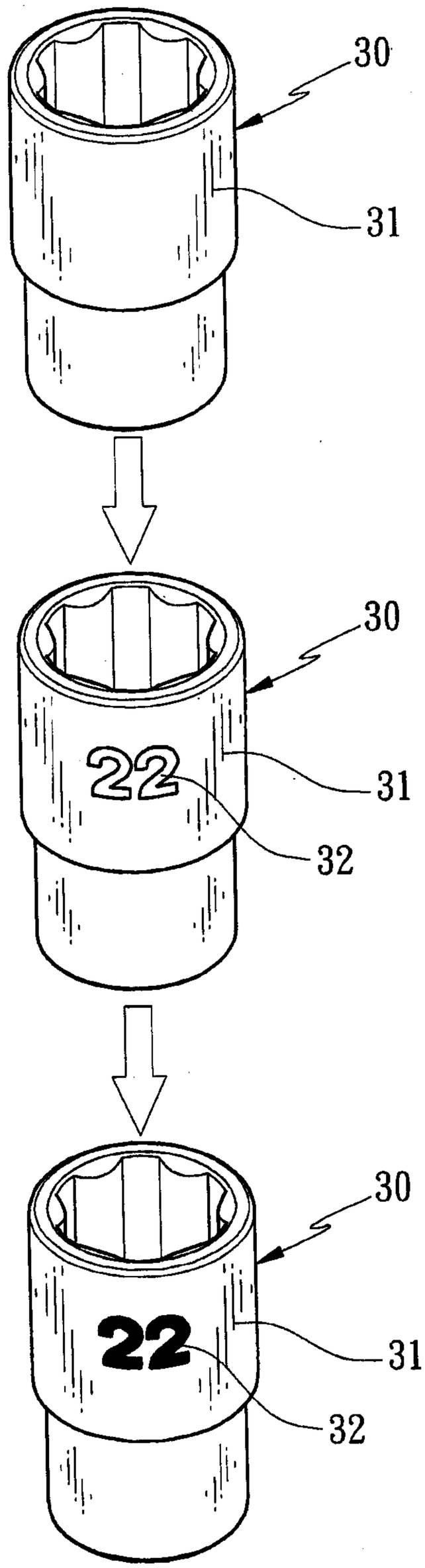


FIG. 3
PRIOR ART

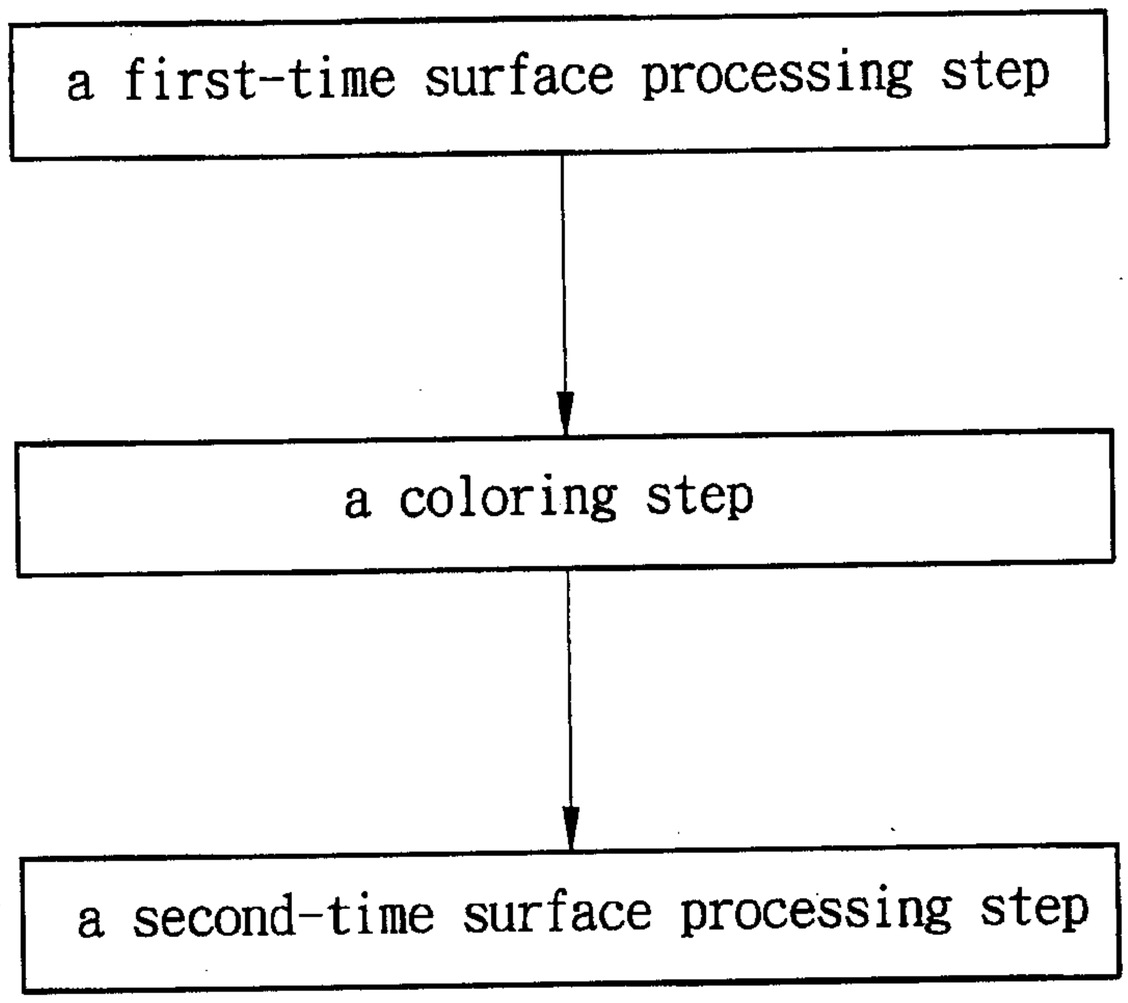

a first-time surface processing step
a coloring step
a second-time surface processing step

FIG. 4

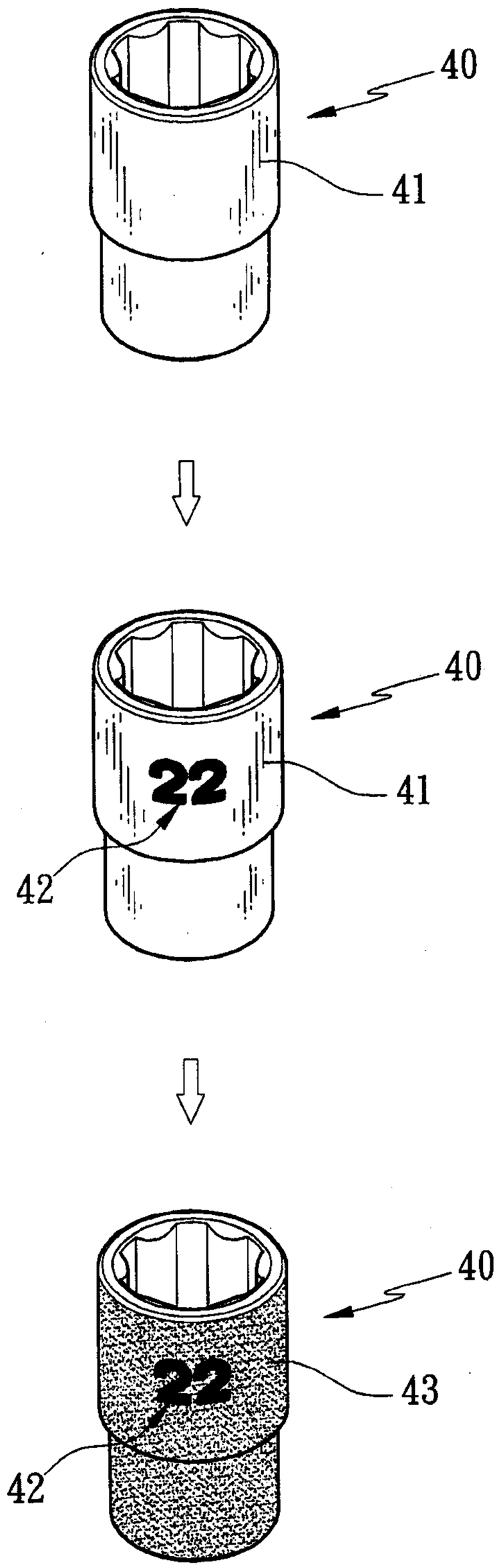


FIG. 5

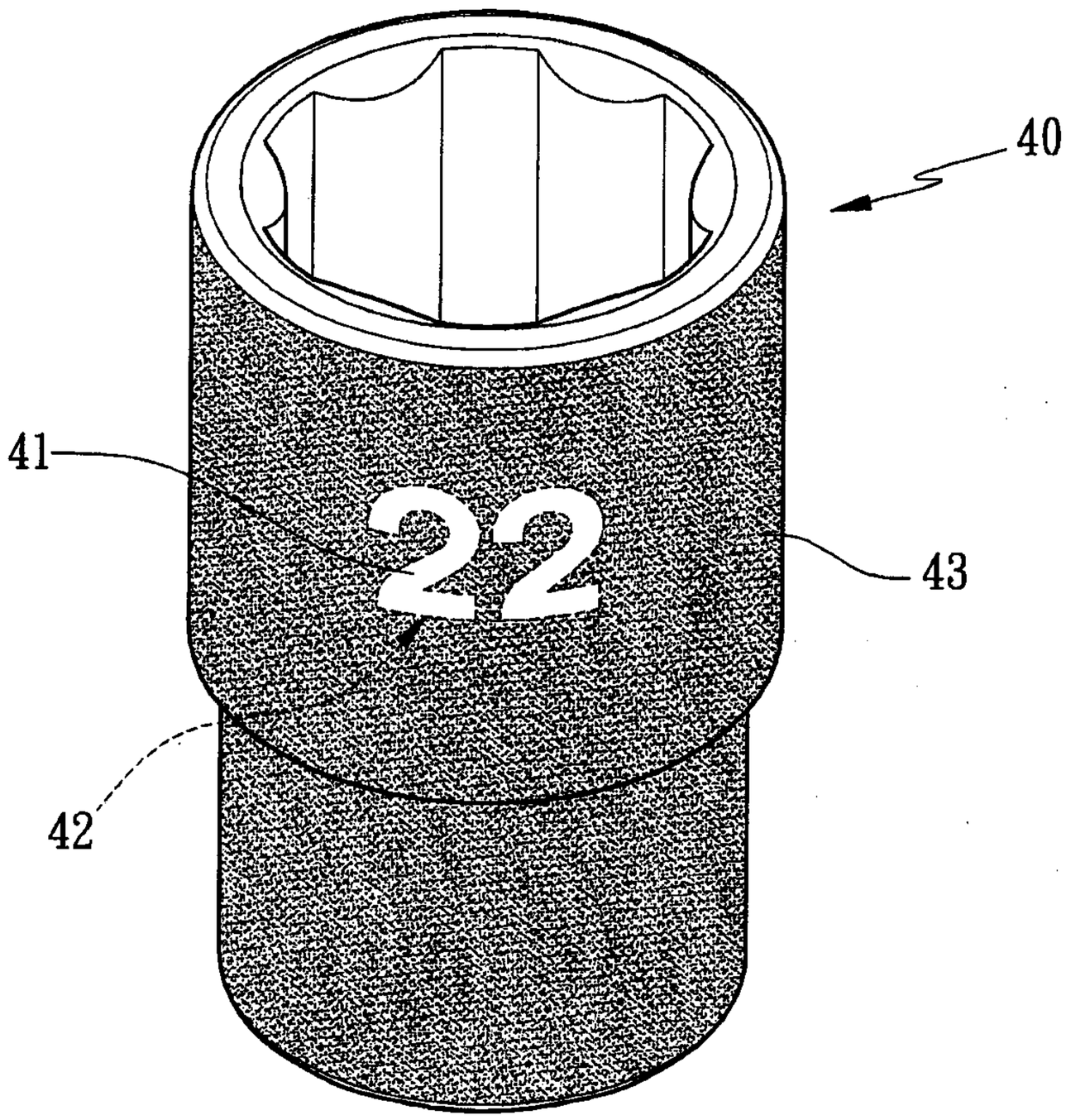


FIG. 6

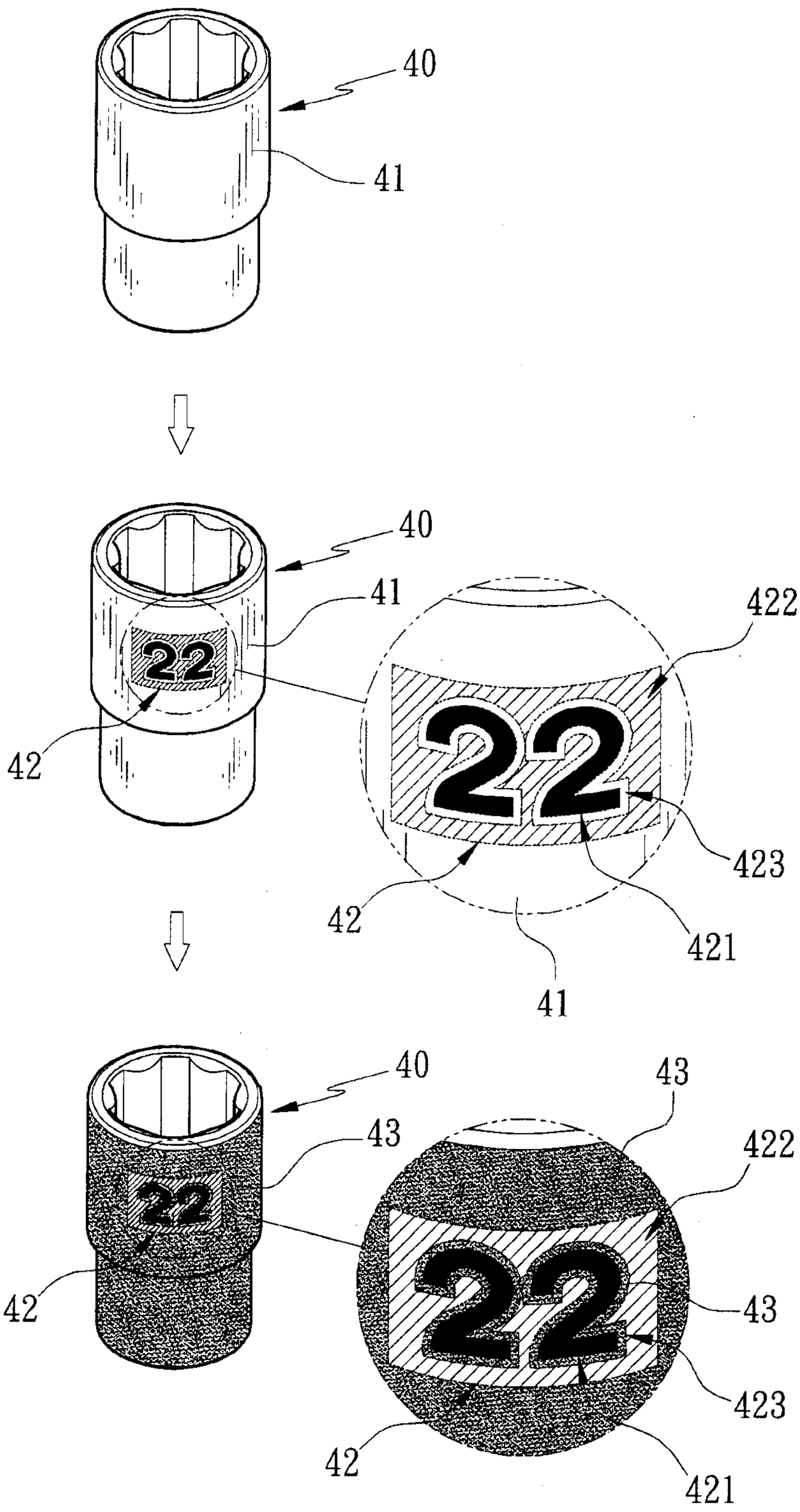


FIG. 7

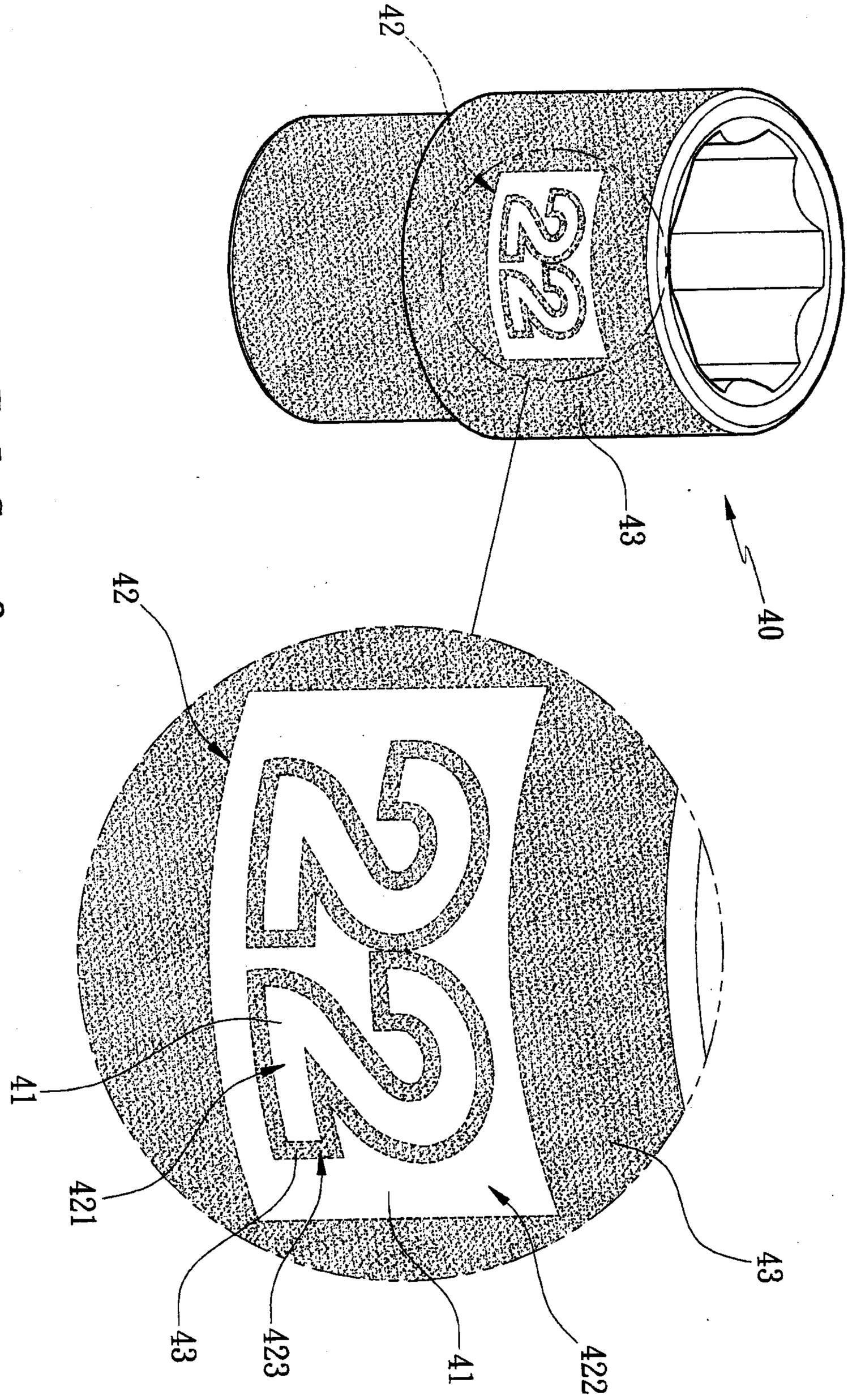


FIG. 8

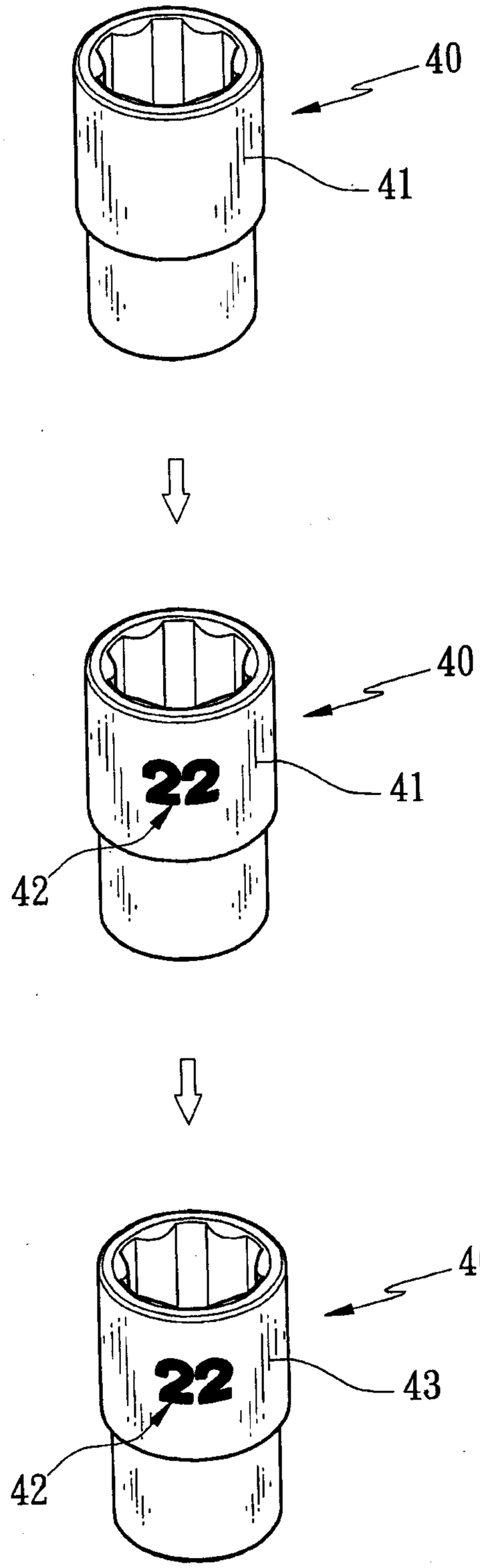


FIG. 9

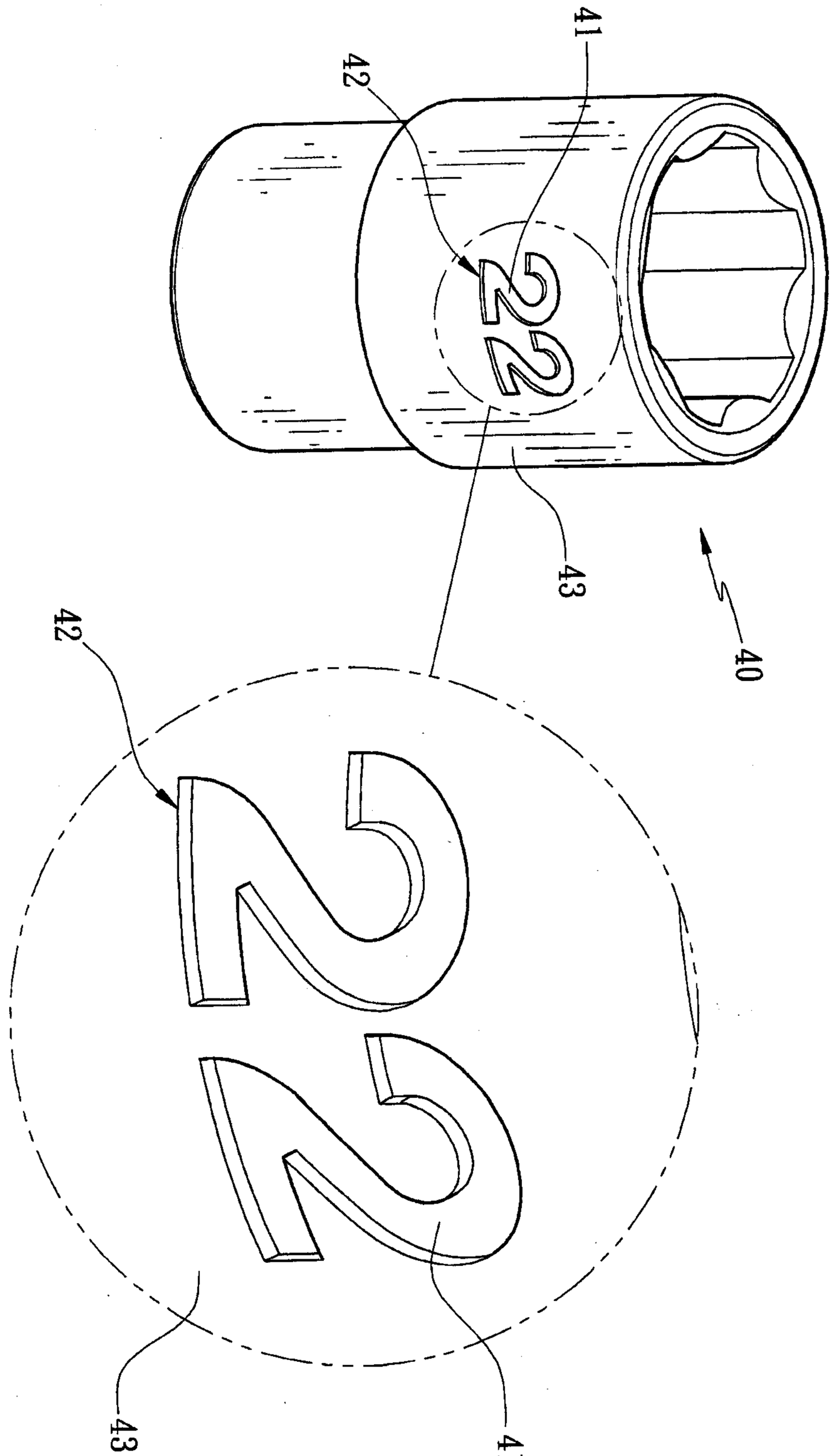


FIG. 10

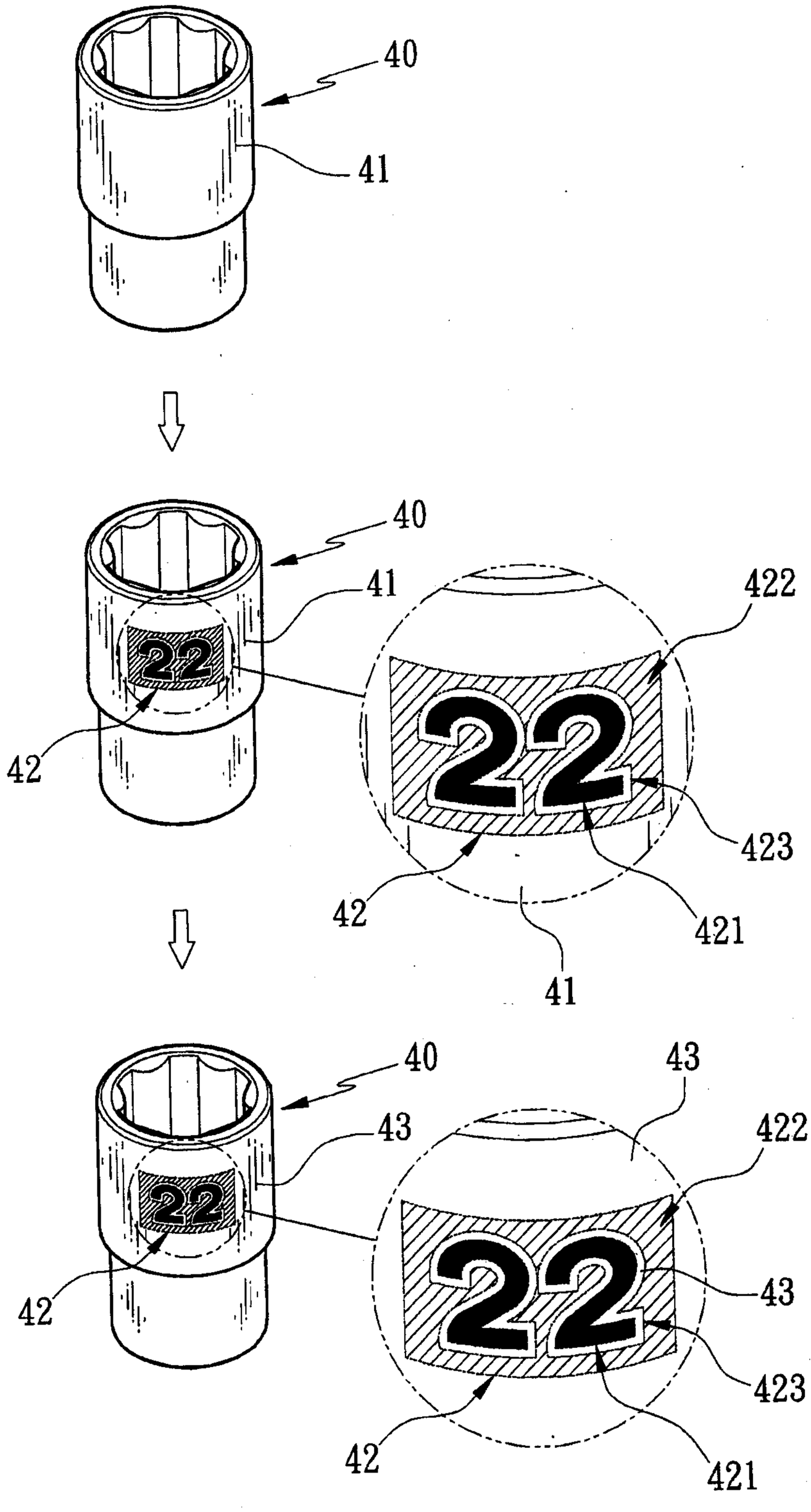
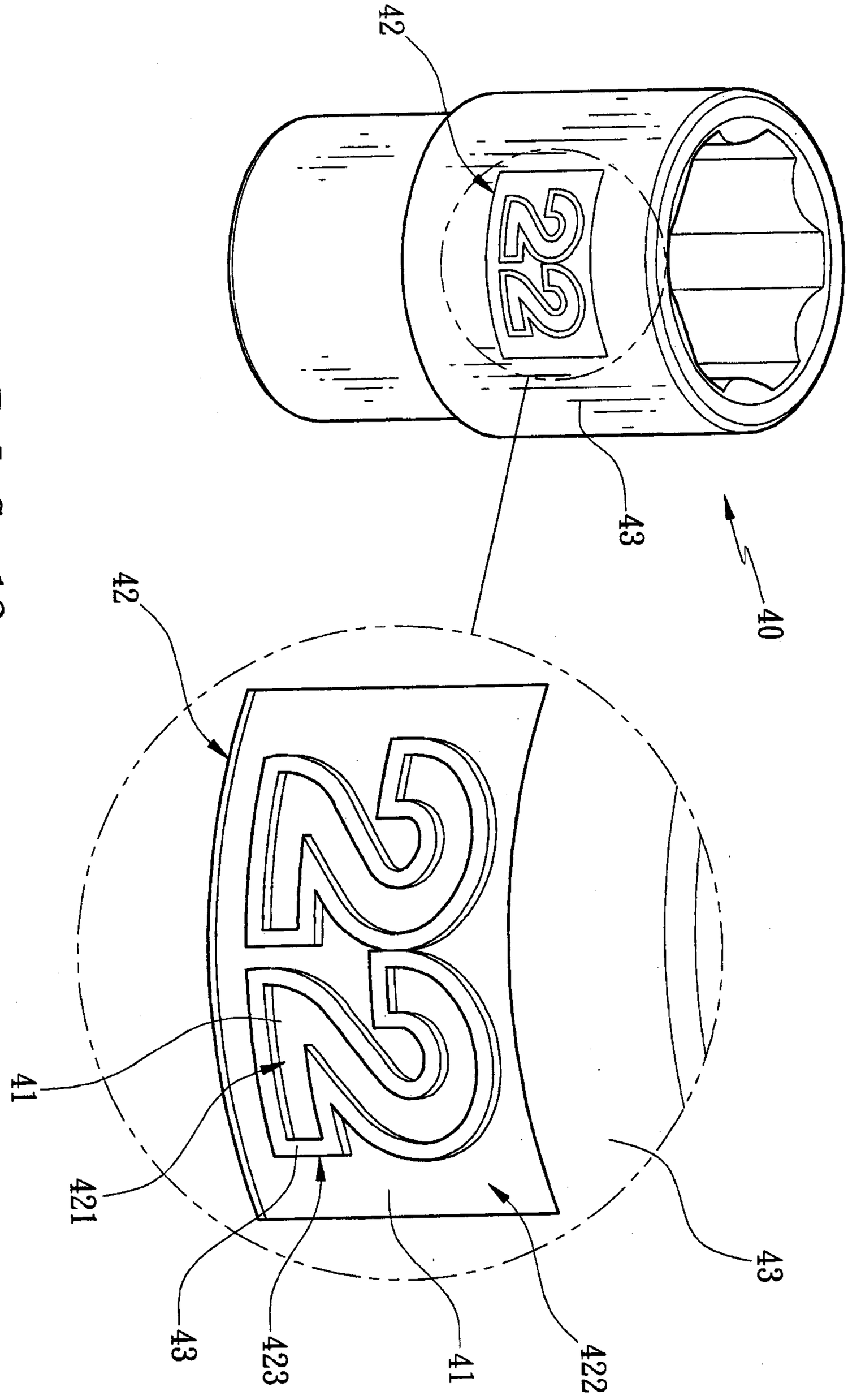


FIG. 11

FIG. 12



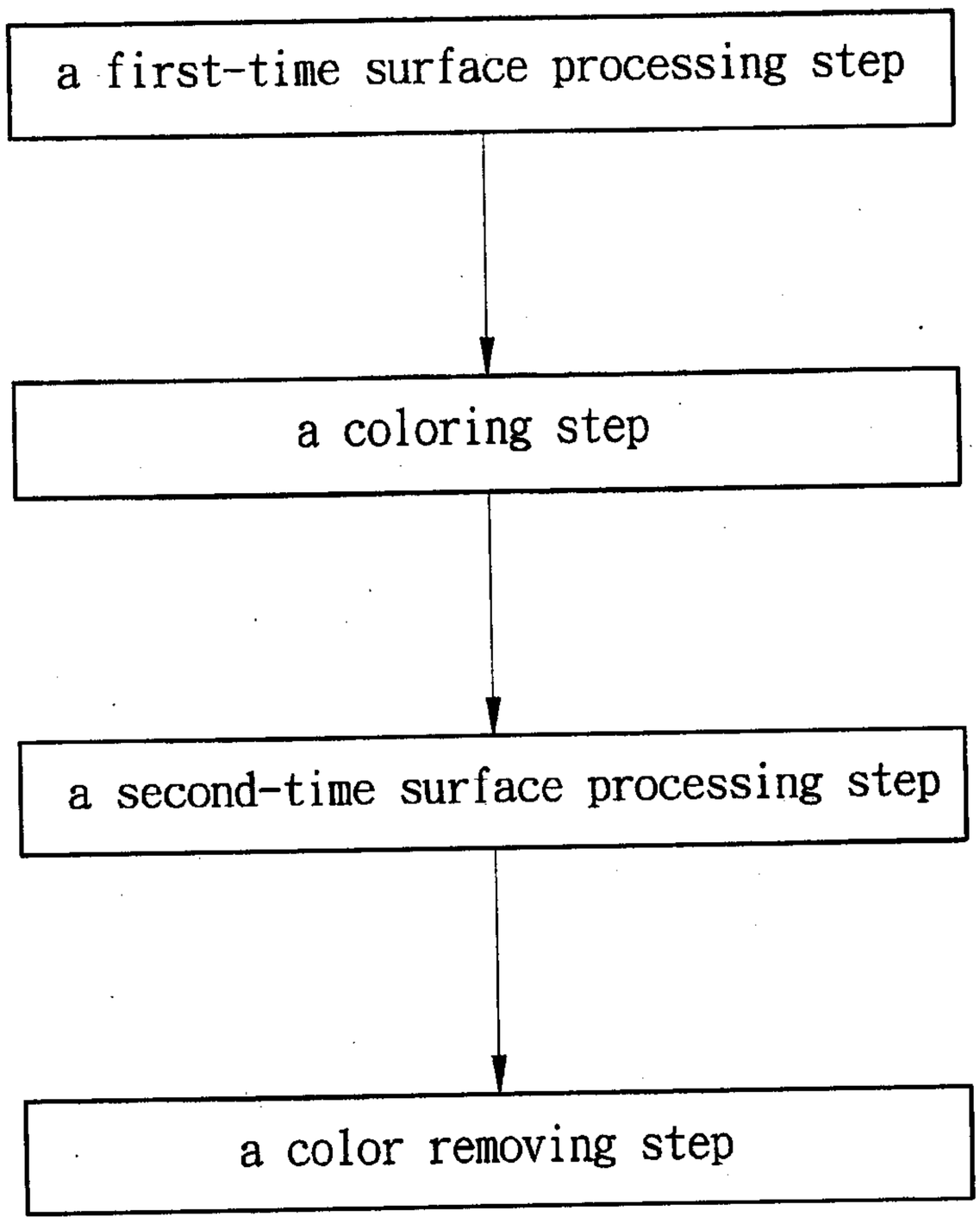
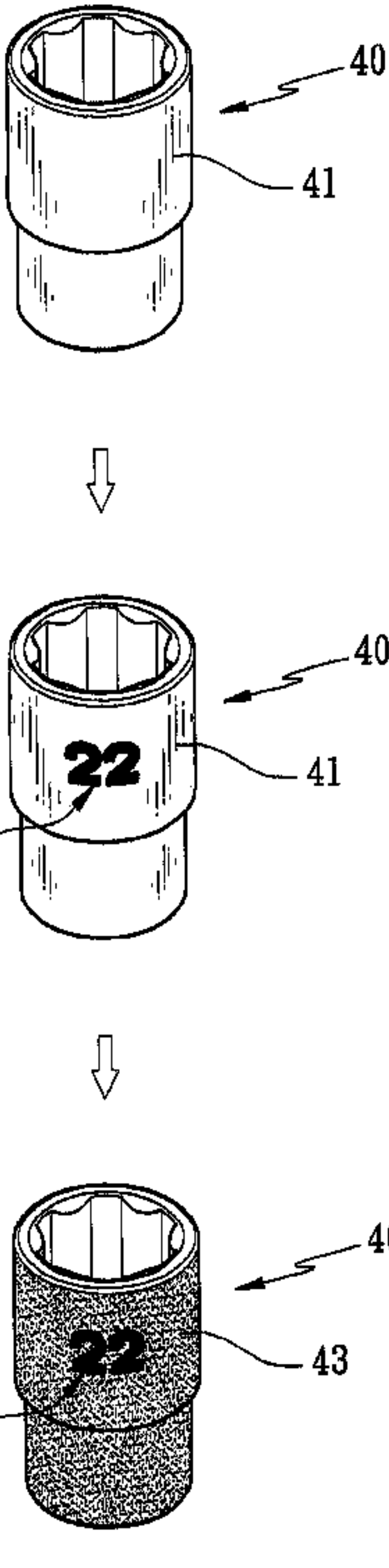

a first-time surface processing step
a coloring step
a second-time surface processing step
a color removing step

FIG. 13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