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(54) Metallic knob and method for making it

(57) A metallic knob includes a hollow base (10) including a first end formed with a column (11) and a second end formed with a bowl (15), the column containing a through bore (12) defined in the bottom thereof, and a hollow cap (20) secured to the bowl (15) of the hollow base (10).

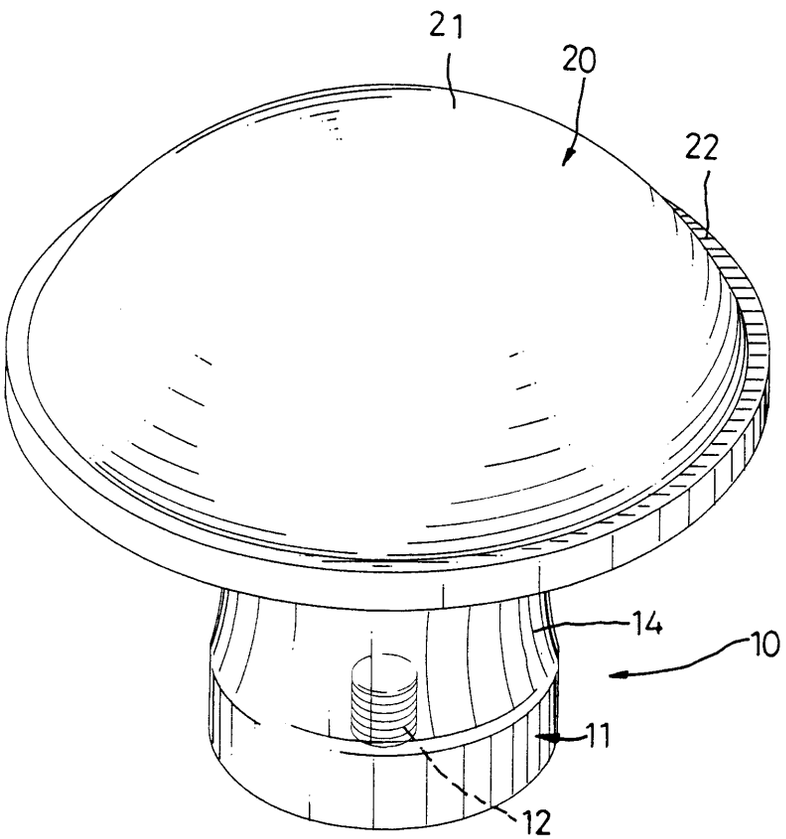

FIG. 1

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Description

[0001] The present invention relates to a metallic knob and a method for making it.

[0002] A conventional metallic knob in accordance with the prior art shown in Fig. 9 can be attached to an article (not shown) such as a drawer, a cabinet, a wardrobe and the like and includes a body (50) made of a solid copper alloy containing a threaded bore (55) defined in the bottom thereof to secure the solid body (50) to the article. Making the body (50) out of a solid material increases the production cost. In addition, the solid body (50) is made by turning it on a lathe such that it takes a great deal of time to make the solid body (50), thereby decreasing the productivity of the metallic knob.

[0003] In accordance with one aspect of the present invention, there is provided a metallic knob comprising: a hollow base including a first end formed with a column and a second end formed with a bowl, the column containing a through bore defined in the bottom thereof; and a cap secured to the bowl of the hollow base.

[0004] In accordance with another aspect of the present invention, there is provided a method for making a metallic knob, comprising the steps of: (a) providing an elongated first metallic sheet; (b) forming a column on the first metallic sheet by punching; (c) forming a through bore in the bottom of the column by punching; (d) forming a bowl on the first metallic sheet by punching, the bowl extending from the column; (e) separating the bowl from the first metallic sheet by punching, thereby forming a hollow base which includes the column and the bowl; (f) providing an elongated second metallic sheet; (g) forming a dome on the second metallic sheet by punching; (h) separating the dome from the second metallic sheet by punching, thereby forming a cap; and (i) securing the cap to the bowl by riveting, thereby forming the metallic knob which includes the hollow base and the cap.

[0005] In the drawings:

Fig. 1 is a perspective view of a metallic knob in accordance with the present invention;

Fig. 2 is a front plan cross-sectional view of the metallic knob as shown in Fig. 1;

Fig. 3 is a flow chart delineating the method for making the metallic knob as shown in Fig. 1;

Fig. 4 is a schematic view showing the process to make the hollow base of the metallic knob as shown in Fig. 1;

Fig. 5 is a perspective view of the hollow base as shown in Fig. 4;

Fig. 6 is a schematic view showing the process to make the cap of the metallic knob as shown in Fig. 1;

Fig. 7 is a perspective view of the cap as shown in Fig. 6;

Fig. 8 is a perspective view of the hollow base in accordance with another embodiment of the present invention; and

Fig. 9 is a front plan cross-sectional view of a metallic knob in accordance with the prior art.

[0006] Referring to Figs. 1 and 2, a metallic knob in accordance with the present invention can be adapted to fit to an article (not shown) such as a drawer, a cabinet, a wardrobe and the like, and comprises a hollow base (10) including a first end formed with a column (11) and a second end formed with a bowl (15), and a cap (20) secured to the bowl (15) of the hollow base (10) and including a dome (21).

[0007] The column (11) includes a concave (14) formed on the periphery thereof, and contains a through bore (12) defined in the bottom thereof and formed with an inner thread (120) to secure the column (11) to the article. The column (11) further contains a plurality of through holes (13) defined in the bottom thereof.

[0008] The bowl (15) contains a plurality of through holes (16) defined in the periphery thereof and includes a lip (17) formed on the periphery thereof, and the cap (20) includes an engaging flange (22) formed on the periphery thereof and secured on the lip (17) of the bowl (15) by riveting.

[0009] Referring to Figs. 3-5 with reference to Figs. 1 and 2, a method is used to make the metallic knob in accordance with the present invention, and includes the steps described as follows.

[0010] First, an elongated first metallic sheet (10A) is fed through a plurality of molds (not shown) so as to be punched by means of a plurality of punch heads (not shown) each of which mate with one of the corresponding molds.

[0011] A column (11) is then formed on the first metallic sheet (10A) by punching. However, a raw blank (11A) with a greater diameter and a shorter height than the column (11) is initially formed on the first metallic sheet (10A) so as to gradually form the column (11), thereby preventing the first metallic sheet (10A) from breaking due to excessive deformation. Then, a recess (122) is formed in the bottom of the column (11), and a through bore (12) is formed in the recess (122) by punching. Next, a plurality of through holes (13) are formed in the bottom of the column (11), and a plurality of through holes (16) are punched in the first metallic sheet (10A) so as to drain cooling water or lubricating oils required during the manufacturing process. Then, a lip (17) is formed on the periphery of the bowl (15), and the bowl (15) is then separated from the first metallic sheet (10A) by punching, thereby forming a hollow base (10) which includes the column (11) and the bowl (15). A concave (14) is then formed on the periphery of the column (11) by a roll pressing process to enhance the aesthetic quality of the hollow base (10).

[0012] Referring to Figs. 3, 6 and 7 with reference to Figs. 1 and 2, an elongated second metallic sheet (20A) is fed through a plurality of molds (not shown) so as to be punched by means of a plurality of punch heads (not

shown) each of which mate with one of the corresponding molds.

[0013] Then, a press seam (26) is formed on the second metallic sheet (20A) by punching to conform to the periphery of the cap (20). A dome (21) is then formed on the second metallic sheet (20A), and is separated from the second metallic sheet (20A) by punching, thereby forming the cap (20). An engaging flange (22) is formed on the periphery of the dome (21) by punching before the dome (21) is separated from the second metallic sheet (20A).

[0014] Then, the cap (20) is secured to the bowl (15) by riveting the engaging flange (22) to the lip (17), thereby forming the metallic knob that includes the hollow base (10) and the cap (20). An inner thread (120) is then formed in the inner periphery of the through bore (12). The metallic knob that includes the hollow base (10) and the cap (20) is then machined by a surface treatment, thereby enhancing the aesthetic quality of the metallic knob.

[0015] Referring to Fig. 8, the dome (21) of the cap (20) may have decorative patterns formed on it, thereby further enhancing the aesthetic quality of the metallic knob.

Claims

1. A metallic knob comprising:

a hollow base (10) including a first end formed with a column (11) and a second end formed with a bowl (15), said column (11) containing a through bore (12) defined in the bottom thereof; and

a cap (20) secured to said bowl (15) of said hollow base (10).

2. The metallic knob in accordance with claim 1, wherein said bowl (15) includes a lip (17) formed on the periphery thereof, and said cap (20) includes an L-shaped engaging flange (17) formed on the periphery thereof and secured on said lip (17) of said bowl (15).

3. The metallic knob in accordance with claim 1, wherein said cap (20) includes a dome (21).

4. The metallic knob in accordance with claim 1, wherein said bowl (15) contains a plurality of through holes (16) defined in the periphery thereof.

5. The metallic knob in accordance with claim 1, wherein said column (11) contains a plurality of through holes (13) defined in the bottom thereof.

6. The metallic knob in accordance with claim 1, wherein said column (11) includes a concave (14) formed on the periphery thereof.

7. The metallic knob in accordance with claim 1, wherein said through bore (12) includes an inner thread (120) formed therein.

8. A method for making a metallic knob, comprising the steps of:

(a) providing an elongated first metallic sheet (10A);

(b) forming a column (11) on said first metallic sheet (10A);

(c) forming a through bore (12) in the bottom of said column (11);

(d) forming a bowl (15) on said first metallic sheet (10A), said bowl (15) extending from said column (11);

(e) separating said bowl (15) from said first metallic sheet (10A), thereby forming a hollow base (10) which includes said column (11) and said bowl (15);

(f) providing an elongated second metallic sheet (20A);

(g) forming a dome (21) on said second metallic sheet (20A);

(h) separating said dome (21) from said second metallic sheet (20A), thereby forming a cap (20); and

(i) securing said cap (20) to said bowl (15) to form said metallic knob which includes said hollow base (10) and said cap (20).

9. The method in accordance with claim 8, wherein step (c) further includes the step of:

forming a recess (122) in the bottom of said column (11); and then

forming said through bore (12) in said recess (122).

10. The method in accordance with claim 8, wherein after step (c) further comprising the step of:

forming a plurality of through holes (13) in the bottom of said column (11).

11. The method in accordance with claim 8, wherein step (d) further includes the step of:

forming a plurality of through holes (16) in said first metallic sheet (10A); and then

forming said bowl (15) which includes said through holes (16).

12. The method in accordance with claim 8, wherein step (e) further includes the step of:

forming a lip (17) on the periphery of said bowl (15) before said bowl (15) is separated from said

first metallic sheet (10A).

13. The method in accordance with claim 8, wherein after step (e) further comprising the step of:

forming a concave (14) on the periphery of said column (11).

14. The method in accordance with claim 8, wherein after step (f) further comprising the step of:

forming a press seam (26) on said second metallic sheet (20A) to conform to the periphery of said cap (20).

15. The method in accordance with claim 8, wherein step (h) further includes the step of:

forming an engaging flange (22) on the periphery of said dome (21) before said dome (21) is separated from said second metallic sheet (20A).

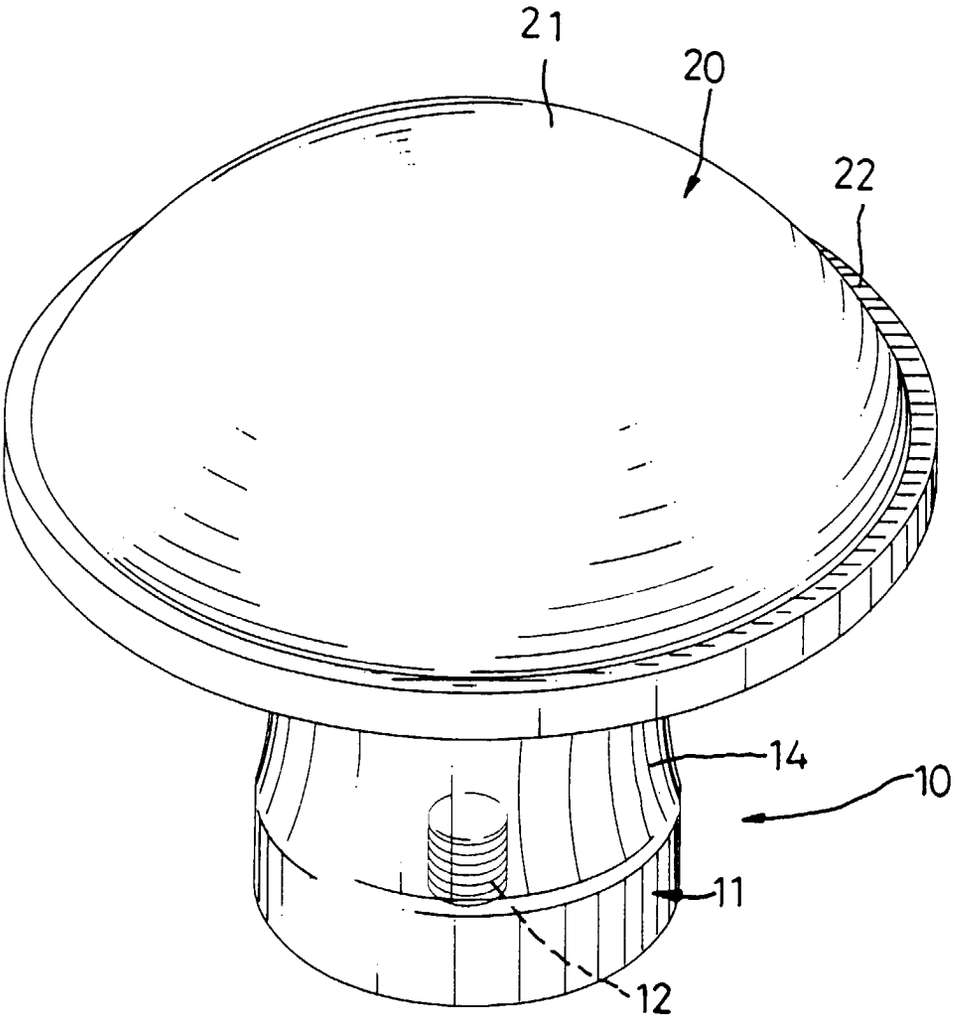

FIG. 1

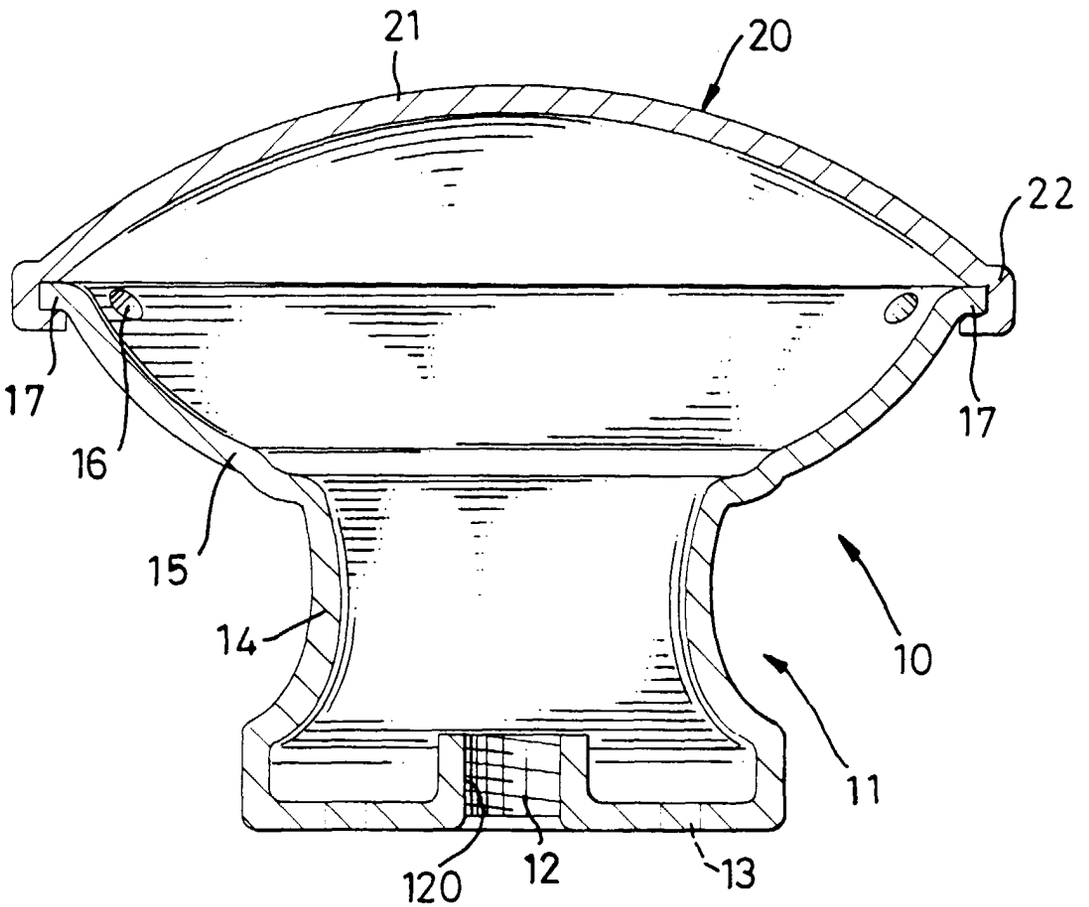

FIG. 2

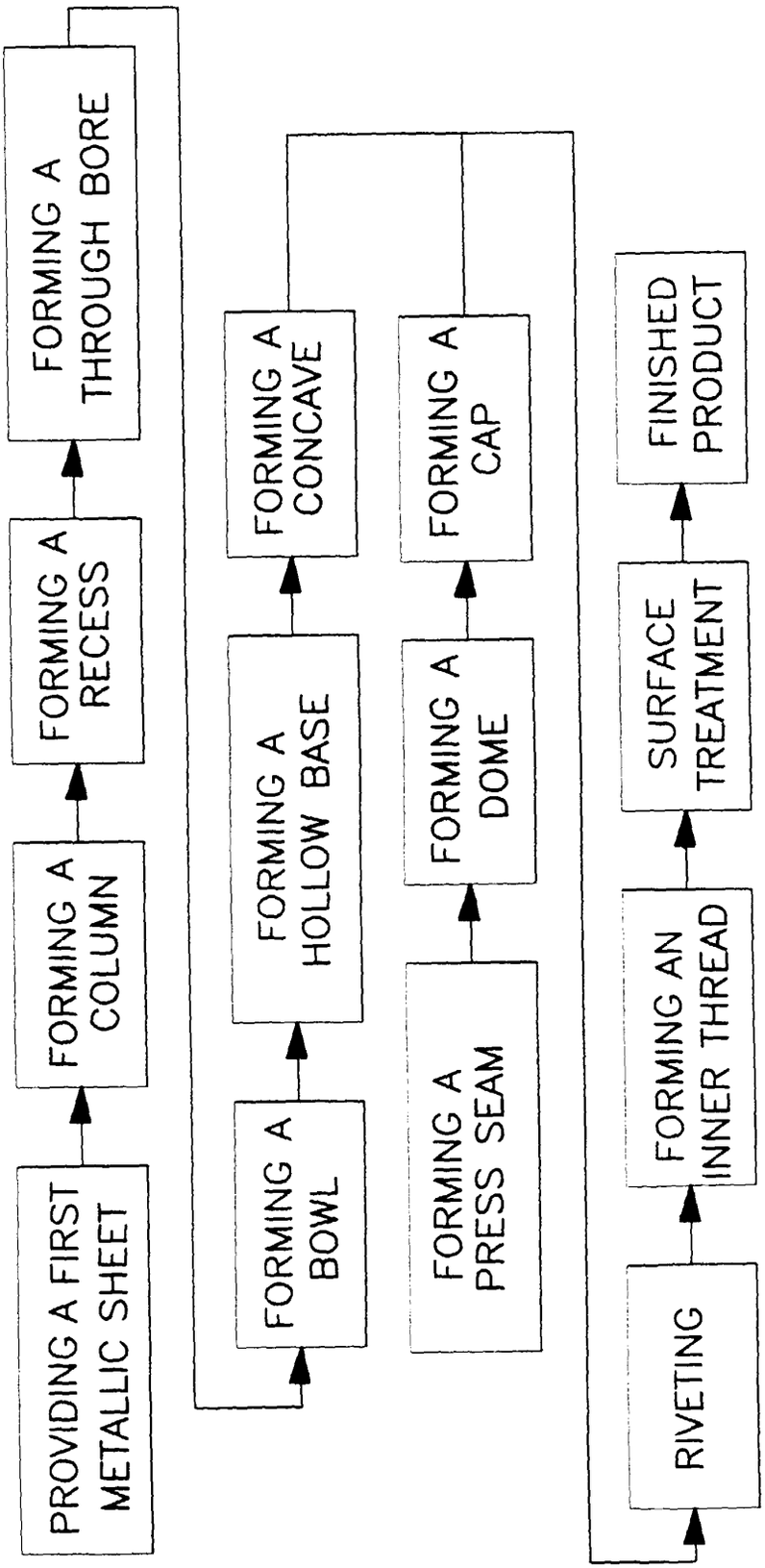
PROVIDING A FIRST METALLIC SHEET
FORMING A COLUMN
FORMING A RECESS
FORMING A THROUGH BORE
FORMING A BOWL
FORMING A HOLLOW BASE
FORMING A CONCAVE
FORMING A PRESS SEAM
FORMING A DOME
FORMING A CAP
RIVETING
FORMING AN INNER THREAD
SURFACE TREATMENT
FINISHED PRODUCT

FIG. 3

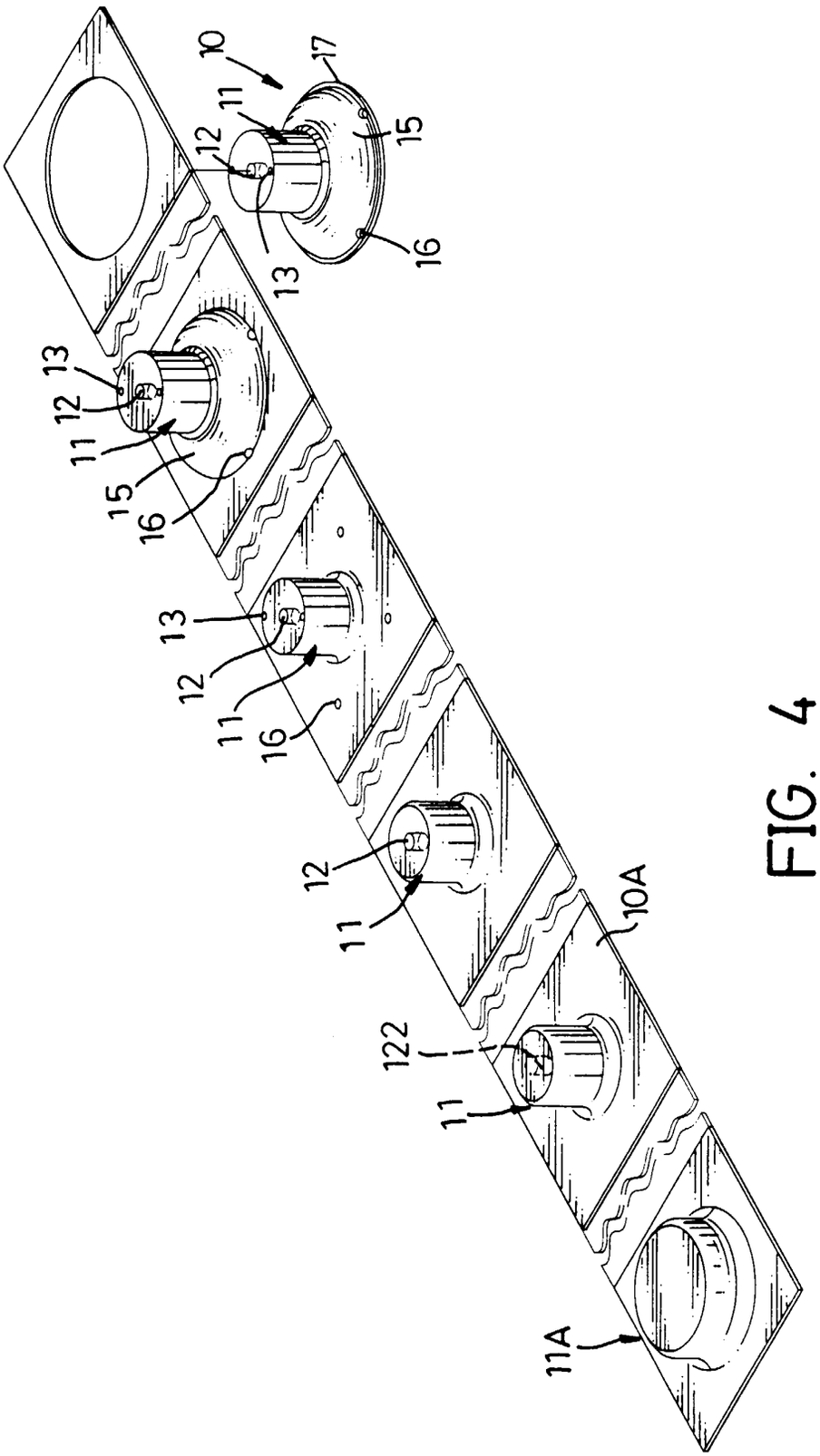

FIG. 4

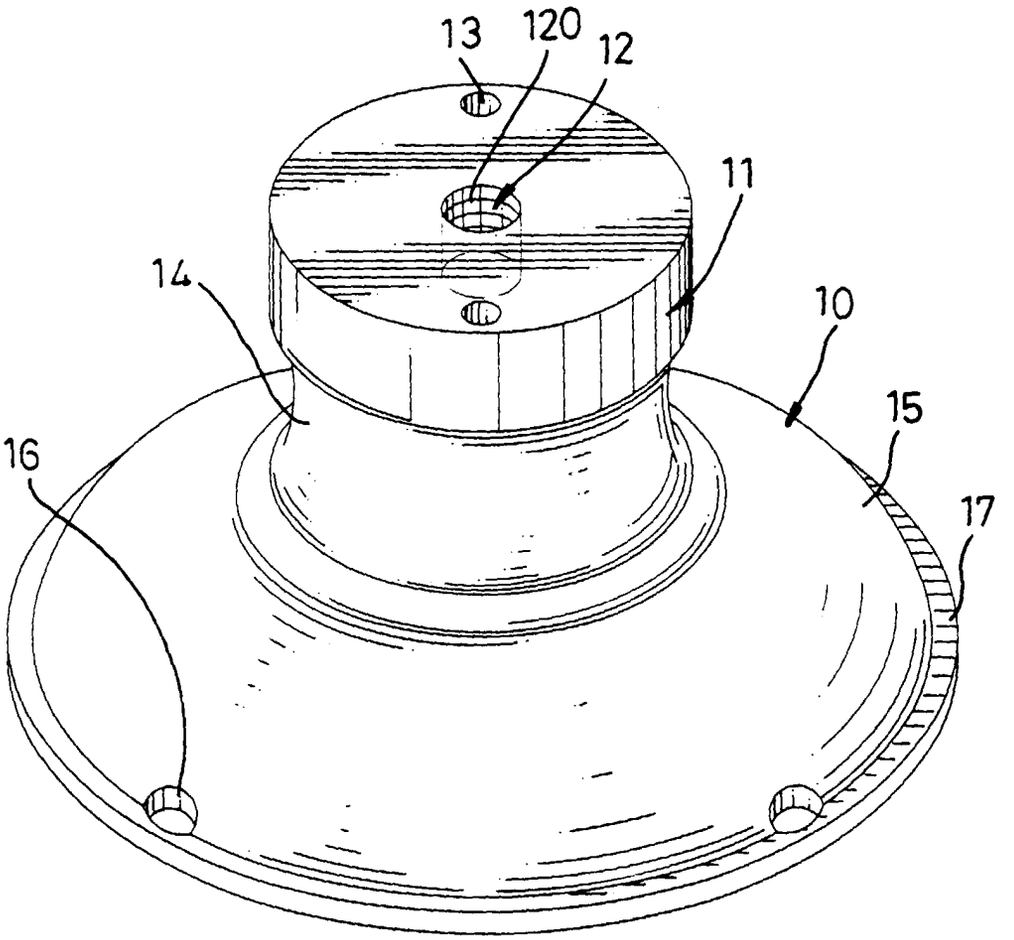

FIG. 5

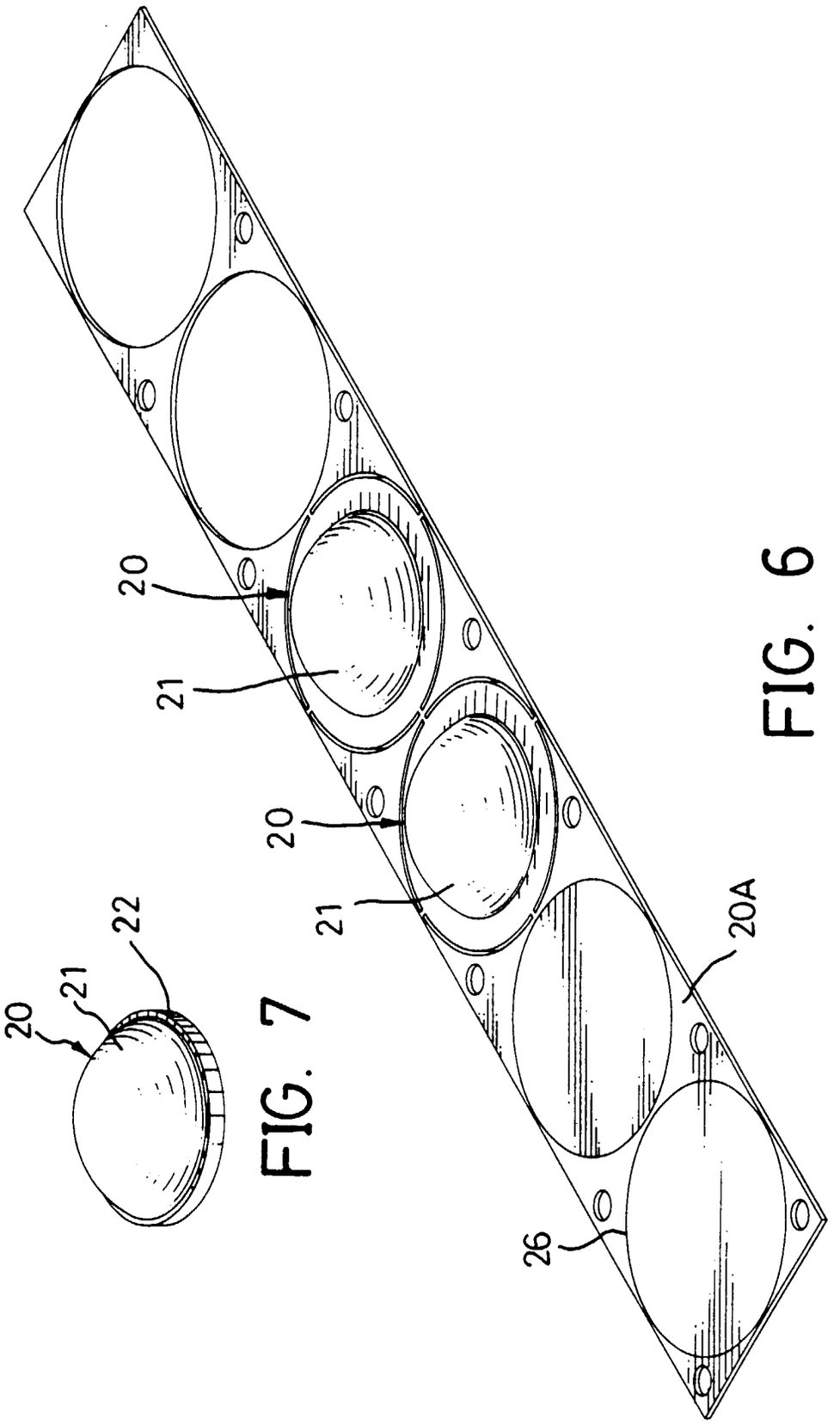

FIG. 6

FIG. 7

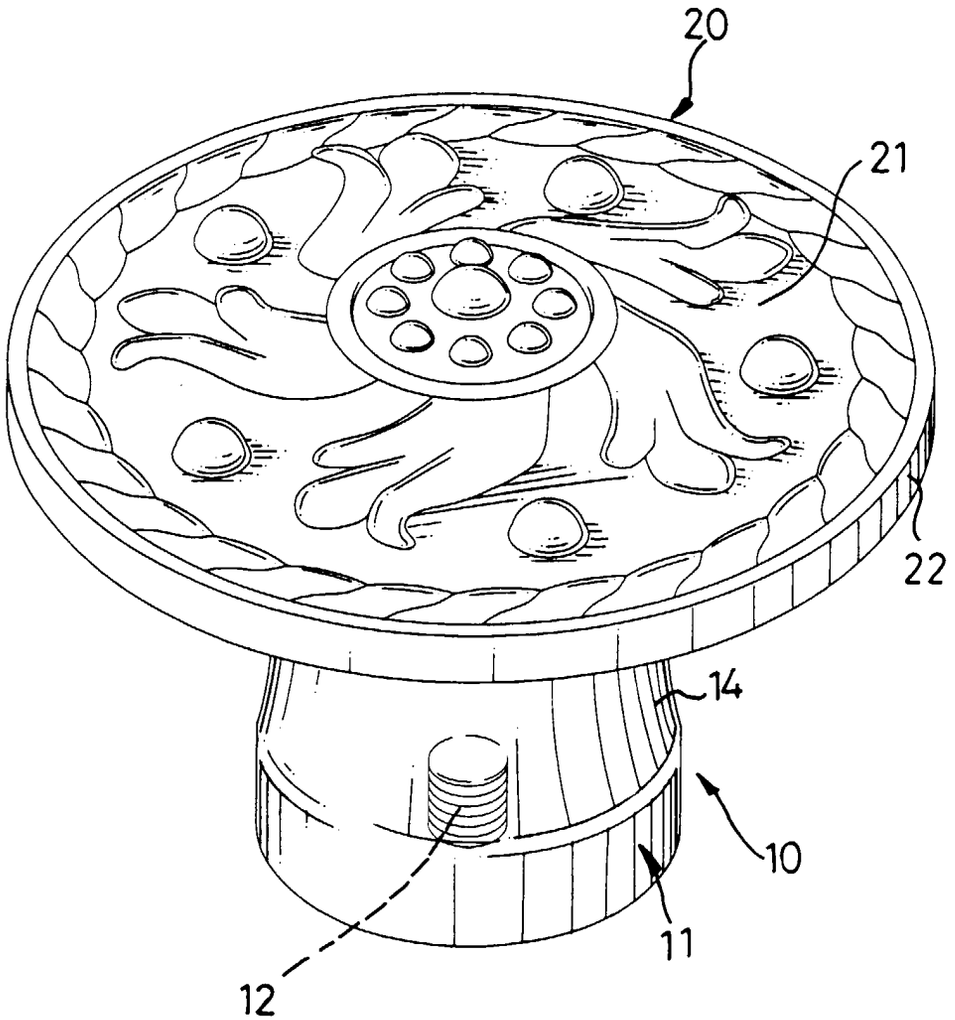

FIG. 8

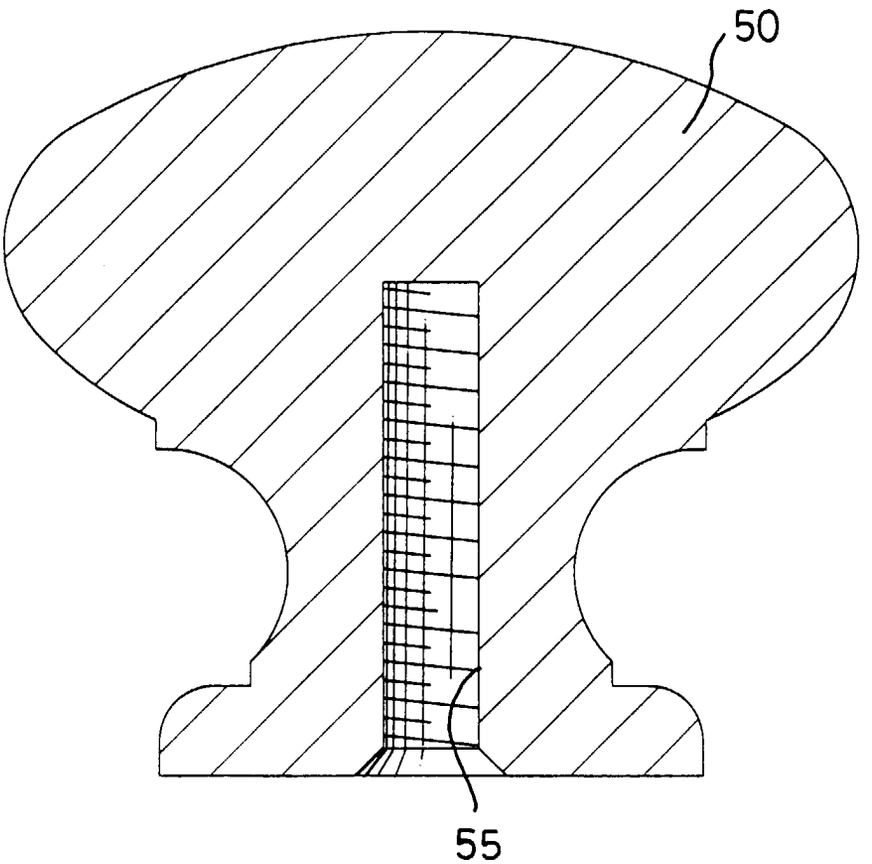

FIG. 9
PRIOR ART

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 20 1456

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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X	US 1 711 209 A (ROBB) 30 April 1929 (1929-04-30) * the whole document *	1-3,6,8	
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A	US 2 489 160 A (SCHOEPE) 22 November 1949 (1949-11-22)		
A	US 3 592 499 A (NELSON KENNETH RAEBURN ET AL) 13 July 1971 (1971-07-13)		

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B21D
E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 January 2000	Peeters, L

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 20 1456

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28-01-2000

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82