Oct. 26, 1926. 1,604,216

C. S. BRAININ

METHOD OF MAKING SPINNERETS

Filed April 2, 1925

Fig. 1

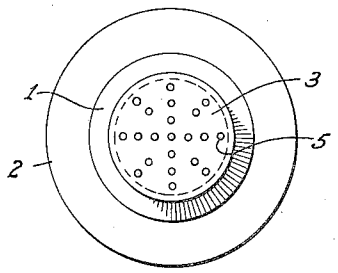



Fig. 2

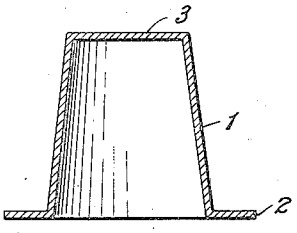



Fig. 3

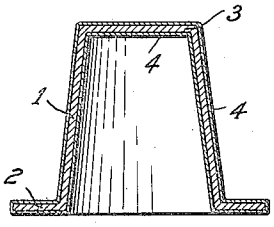



Fig. 4

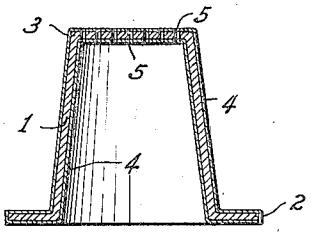
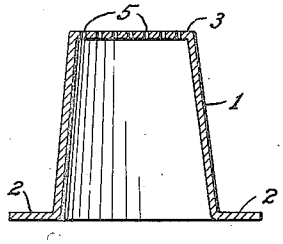



Fig. 5




INVENTOR
Clement S. Brainin
BY
Duell Anderson & Duell
ATTORNEYS

Patented Oct. 26, 1926. 1,604,216

# UNITED STATES PATENT OFFICE.

CLEMENT S. BRAININ, OF GLEN RIDGE, NEW JERSEY.

## METHOD OF MAKING SPINNERETS.

Application filed April 2, 1925. Serial No. 20,032.

This invention relates to methods for making very small holes in metal, and more particularly for the manufacture of metallic articles, such as spinneret cups for artificial silk, in which small holes are required.

An object of this invention is to provide a method for making devices of the character described economically and efficiently without an excess of expensive hand labor.

The invention accordingly comprises the several steps and the relation and order of one or more of such steps with respect to each of the others thereof, which will be exemplified in the method hereinafter disclosed, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a top plan view of a spinneret made in accordance with this invention;

Fig. 2 is a cross-sectional view of the blank from which this spinneret is made;

Figs. 3 and 4 are views of the blank after undergoing steps of the process; and

Fig. 5 is a similar view of the completed spinneret.

It is necessary in the manufacture of many small articles, such for example as the spinnerets with which artificial silk is made, to drill exceedingly fine holes through metallic members and to leave the article without a burr on either side. To accomplish this result, it has heretofore been customary after drilling the holes through the articles, to carefully polish both faces to remove the burr which resulted from the drilling and subsequently to remove the burr resulting from the polishing, continuing this process until the holes are completely cleaned. This is a process requiring great care by reason of the facts that the holes may be of small diameter, as for example, the holes in spinnerets may vary between .003 and .006 in. in diameter.

In accordance with this invention, the blank or article is coated upon each side with some metal sufficiently resistant itself to prevent the formation of a burr in the metal of the blank, and thereafter it is dissolved or otherwise removed from the blank together with any burr which may be formed from its own metal to leave the blank itself free from burr.

A convenient method of accomplishing this result has been found to be to plate the blank inside and out with a coating of copper or other suitable material, which may be readily deposited upon it electrolytically, which is capable of giving sufficient support to the material at the hole, but which is capable of being readily removed by the application of acid.

In the drawings, the numeral 1 constitutes a blank which may be of general cup shape formation having flanges 2 for support and having a face 3. This blank is ordinarily made of platinum, or of platinum alloyed with gold. This blank may be readily plated inside and outside with copper as shown at 4 in any suitable bath. Thereupon nozzle orifices 5 may be drilled through the face 3. This drilling will ordinarily produce a burr where the drill enters the copper as well as where it leaves. This burr, however, will be in the coating itself and composed of the material thereof. There will be no burr at the point where the drill leaves the copper to enter the platinum or at the point where the drill leaves the platinum to enter the copper, because the copper furnishes sufficient support to the drill and to the platinum to prevent such formation. By reason of that fact, the burr may be completely removed from the article by submerging the cup in an acid bath, such for example, as nitric acid, leaving the cup with its openings clean on both inside and out, without being worked further.

Since certain changes may be made in carrying out the above method without departing from the scope of the invention, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The process of perforating a metal sheet, which comprises applying a supporting coat to the sheet and drilling through the sheet and coating, and then removing the coating.

2. The process of perforating a metal sheet, which comprises applying a supporting coating on both surfaces thereof, drilling through the sheet and coating and then removing the coating.

3. The process of perforating a metal sheet, which comprises depositing a metallic coating upon the surface thereof, perforating the sheet and coating and subsequently removing the coating.

4. The process of perforating a metal sheet, which comprises electro-plating the said sheet with copper, drilling through the sheet and copper and then removing the copper.

5. The process of making spinnerets, which comprises electro-plating a spinneret blank, drilling through the same, and then removing the coating.

In testimony whereof I affix my signature.

CLEMENT S. BRAININ.