

April 23, 1935.

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1,999,072

SPINNERET FOR THE MANUFACTURE OF RAYON

Filed March 25, 1933

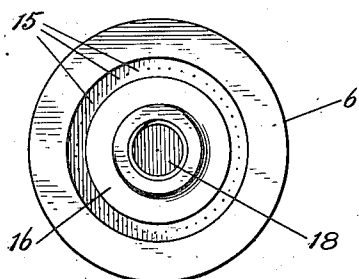
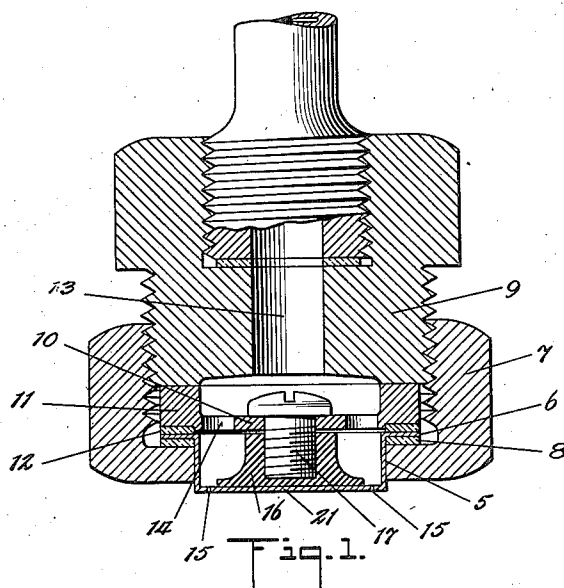


Fig. 2.

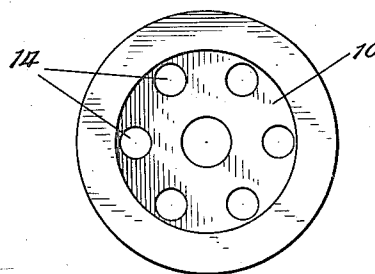


Fig. 3.

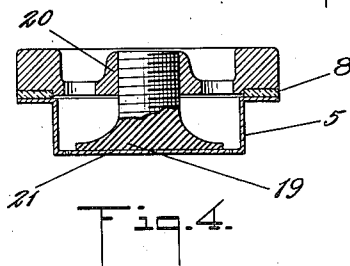


Fig. 4.

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UNITED STATES PATENT OFFICE

1,999,072

SPINNERET FOR THE MANUFACTURE
OF RAYONGeorge Morrison Allen, Ridley Park, Pa., assignor
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corporation of Pennsylvania

Application March 25, 1933, Serial No. 662,751

3 Claims. (Cl. 18—8)

This invention relates to a spinneret or spinning nozzle for the manufacture of rayon, and more particularly to spinnerets used in the cellulose acetate process of making rayon. One object of the invention is to produce an improved spinning nozzle which is capable of withstanding the high pressures of cellulose acetate spinning without distortion and which at the same time can be formed of metal sufficiently thin to facilitate drilling or punching of the necessary small holes. It is also highly desirable to have the outer face of the spinneret proper of one piece, i. e., clear of all obstructions or joints, in order that this surface may not readily foul and may easily be wiped clean. In a spinning nozzle made according to this invention the outer surface or face of the spinneret is one piece and flat, and the face is supported internally at all points except the immediate hole area. Other advantages of the invention will appear as the details are described.

In the drawing,

Fig. 1 is a vertical section through a spinneret and attachments made in accordance with the invention;

Fig. 2 is a plan view of the spinneret through which the spinning dope is forced;

Fig. 3 is a plan view of the supporting plate; while

Fig. 4 is a vertical section through a modified form of spinneret and supporting plate.

In spinning acetate rayon it is desirable to extrude the dope or spinning solution through a large number of very small holes. For example, a spinneret common to present practice contains forty holes, each hole being $2\frac{1}{2}$ mils in diameter.

In spinning cellulose acetate the solution is extruded under pressures often as high as 1000 to 2000 pounds per square inch and the strain on the spinneret is great. It is common practice, therefore, to construct spinnerets for acetate rayon of metal or alloy having a thickness of 50 mils or more. In order to form the small holes with a reasonable degree of accuracy and speed it is desirable to construct the face of the spinneret of metal not exceeding about 15 mils in thickness. One object of this invention is to make this possible.

In the drawing the spinneret proper is in the form of an inverted cap 5 with the flange 6 resting on the inside of a retaining nut 7 and the crown projecting downwardly through the opening in the nut and the face 21 lying even with the lower side of the nut or projecting slightly beyond. Between the retaining nut and the

flange of the spinneret is a washer 8 to make the connection tight. The retaining nut is screwed to a threaded base 9, but between the base and the flange of the spinneret is supporting means in the form of a plate 10. This supporting plate has a thick rim 11 separated from the spinneret by another washer 12. The plate and spinneret thus are held together between the retaining nut and the threaded base. The spinning solution is brought to the spinneret through a central opening in the threaded base and a circular series of large holes in the supporting plate. The small holes 15 in the spinneret are arranged in a circle close to the outer edge of the face of the spinneret, as can be seen in Fig. 2.

To assist the central area of the face of the spinneret in withstanding the high pressure of the spinning solution, a post 16 is soldered, welded or otherwise affixed to the inner face of the spinneret and connected to the supporting disk 10—preferably by a thread and screw connection. Thus in Figs. 1, 2 and 3 the connection is made by a screw 17 projecting downwardly through the supporting plate into a threaded opening 18 in the center of the supporting post. In Fig. 4 the supporting post 19 itself is threaded on the outside and the opening 20 in the center of the supporting plate is threaded to receive it. In both forms the foot of the supporting post extends outwardly to a position close to the circle of holes in the face of the spinneret. It will therefore be observed that the face of the spinneret is strengthened and supported on both sides of the circle of holes and close to the holes without obstructing the smooth outer face 21 of the spinneret.

The spinneret itself may be constructed of any of the noble metals, such as platinum or gold and their alloys, or even of such suitable common materials as nickel, stainless steel, monel, and the like. When constructed according to this invention the thickness of the metal can be made much less than the usual 50 mils, for example, 15 mils or even less. By the use of such thin metal construction the cost of a precious or noble metal spinneret becomes economically practical. The noble metals possess many desirable qualities, such as fine grain structure, workability, capacity for taking and holding a high polish, and chemical inertness.

What I claim is:—

1. A spinneret for spinning rayon or the like comprising a cup-shaped member having a flat perforated exposed surface and an annular flange, a perforated plate engaging said flange and form-

ing a chamber with said member, a support, means
engaging said flange and securing said member
and plate to said support and means in said
chamber connecting said member and plate to
5 support said surface.

2. A spinneret for spinning rayon or the like,
comprising a cup-shaped member having a bot-
tom provided with holes through which the dope
is extruded and providing a flat exposed surface,
10 in combination with a supporting plate and a
supporting post attached to the inner face of

the bottom of the spinneret and to said support-
ing plate.

3. A spinneret for spinning rayon or the like
comprising a cup-shaped member having a bot-
tom provided with holes arranged near the outer
edge thereof and providing a flat exposed surface,
in combination with a supporting plate and a
post connecting said plate and the inner face of
the central area of said bottom for supporting the
surface.

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