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APPARATUS FOR THE MANUFACTURE OF ARTIFICIAL FILAMENTS OR THE LIKE

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FIG.1

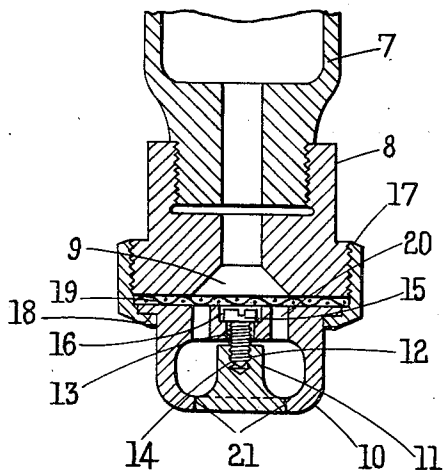


FIG.2

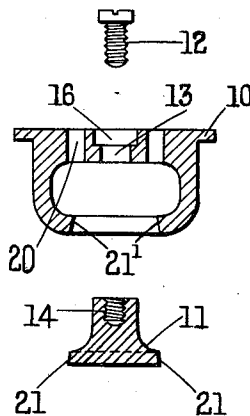


FIG.3

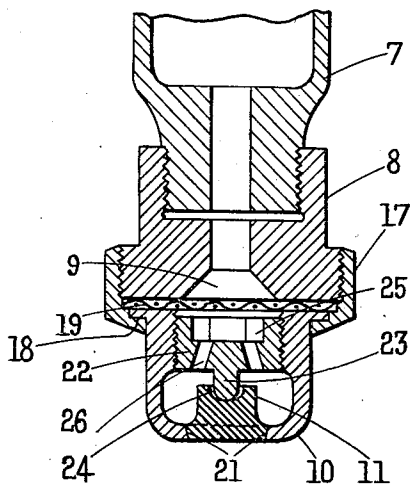


FIG.4

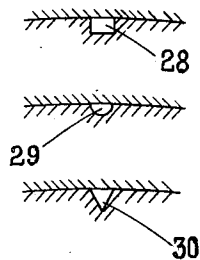


FIG.5

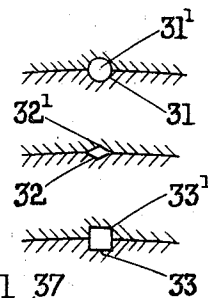


FIG.6

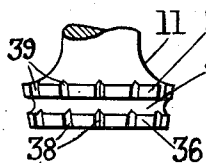
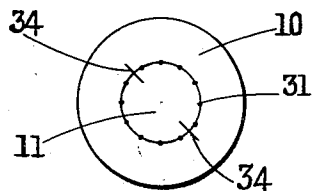


FIG.7

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APPARATUS FOR THE MANUFACTURE OF
ARTIFICIAL FILAMENTS OR THE LIKEEdward Kinsella, Spondon, near Derby, England,
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4 Claims. (Cl. 18—8)

This invention relates to the production of artificial filaments and the like by extruding spinning solutions through the orifices of spinning jets into an evaporative atmosphere or coagulation bath, and is particularly concerned with the form of the spinning jets or nozzles used for this purpose and the method of manufacturing such jets or nozzles.

It is an object of this invention to enable spinning jets to be manufactured with accuracy as regards the size and shape of the spinning orifices, and to enable the cleaning of the jets to be readily effected.

A spinning jet according to the invention comprises a body member adapted to be connected to a source of supply of spinning solution, and a face member or plug having a conical edge adapted to be forced into contact with a conical seat of the body member, notches being formed at the surface of contact between the body member and the plug so as to constitute spinning orifices to which spinning solution is conducted through the body member. The notches may be formed either in the conical surface of the plug, or in the conical seat of the body member, or in both. Where both surfaces are formed with notches, these notches may be in register, so that two notches together constitute one spinning orifice. The notches may be of any desired form to produce filaments of any desired cross-section. Thus, the notches may be formed by means of a saw, or other suitably shaped tool, to produce spinning orifices of triangular, square, rectangular, semi-circular, or other cross-section. By causing notches in both surfaces to register with each other, many other forms of orifice of symmetrical or asymmetrical cross-section may be formed.

The plug may be forced into its seating in the jet body either outwardly, from inside the jet body, or inwardly from outside. It is necessary that the plug and the jet body should fit flush together to give an even composite surface to the face of the assembled jet, and for this purpose the two may be accurately ground until a good flush fit is obtained. In order to provide an improved seating surface and to decrease the length of the spinning orifices, an annular groove may be made round the seating surface, either of the jet body, or of the plug, or both. After the jet has been assembled it may be convenient that the face of the jet should be lightly ground and polished.

In order that the force with which the plug is retained in its seating in the jet body shall not

distort either the jet body or the plug, it is preferred that the force should be applied to the plug at a point remote from the orifices. Thus, the plug may be in the shape of an inverted mushroom or truncated cone, the head of the mushroom or the base of the cone constituting part of the surface of the jet face, while the stem of the mushroom or the smaller end of the cone is adapted to be attached to the jet body. The plug and jet body may conveniently be secured together by means of a screw connection. Thus, the stem of the plug may be screw cut and may pass through a central hole in the upper surface of the jet body to be secured from above by means of a nut. Alternatively, a screw may be passed through a central hole in the upper surface of the jet body, and be secured in a screw cut hole running down the stem of the mushroom. These arrangements enable the plug to be drawn in to its seating in the jet body from outside.

Instead of being forced inwardly into the jet body, the plug may be fitted outwardly from inside. Thus an opening may be provided in the upper surface of the jet face which is large enough to allow the plug to be dropped in, and which is screw cut to permit a member to be screwed into it in order to force the plug outwardly into its seating, or, alternately, the plug may be retained in position by gravity and by the pressure of the spinning solution. The supply of spinning solution to the inside of the jet body may be accomplished in any convenient manner, as for example by a circle of holes in the upper surface of the jet body, or, where the plug is forced outwardly into its seating, by a number of passages running through the threaded forcing member.

The notches constituting the orifices may be formed either in the edge of the plug or in the corresponding edge of the jet body, or in both. Orifices of any required shape may be produced in this manner by means of accurate saw cutting, and these orifices may be of any required size, and, if desired, may be caused to taper, contracting as they lead out of the jet body, in order to increase the steadiness of flow of the spinning solution from the orifices. If an annular groove is provided round the seating of the jet plug, instead of tapering the orifices, the notch in the upper part of the seating surface may be made deeper than that in the lower part.

If notches are cut both in the jet body and in the plug, it may be desirable to cause the notches in the edge of one to register with the notches in

the edge of the other, thus forming a number of orifices, each bounded by two notches. The method of securing the plug to the jet body by means of a separate nut or screw adapted to hold the two together readily enables the plug to be forced into the jet body in such a manner that the cuts in the edges of the two parts accurately register together. In addition, it is desirable that registering means, such as an etched or scratched indexing mark should be provided in connection with the plug and the jet body, to render more easy the operation of connecting the two in correct relationship.

The spinning jet according to the invention may be flanged for convenient connection to the source of supply, and may be connected directly to the spinning solution filter body or to an intermediate attachment or adaptor member, by means of a nut holding the flanged face against the lower face of the filter body or attachment. If desired filter cloth may be secured between the spinning jet and the attachment, or between the spinning jet and the filter.

The invention will now be described in greater detail with reference to the accompanying drawing, but it is to be understood that this description is given by way of example only and is in no respect limitative.

Fig. 1 shows a jet assembly of one form of jet according to the invention;

Fig. 2 shows details of the jet shown in Fig. 1;

Fig. 3 shows a further form of jet according to the invention;

Figs. 4 and 5 show various forms of jet orifice; and

Fig. 6 shows a view of the jet face from beneath.

Figure 7 shows a modified detail of the jet face member described with reference to Fig. 3.

Referring to Figs. 1 and 2, a filter candle 7 is provided with a jet attachment 8 having a communicating passage for the spinning solution, opening with a flared mouth 9. The jet comprises a body 10 with a jet face member or plug 11 and a screw 12. The screw 12 passes through a hole 13 in the body 10 and screws into the stem 14 of the mushroom 11, the head 15 of the screw 12 fitting into a recess 16. The jet body is connected to the jet attachment 8 by means of a large hexagonal nut 17 engaging with a flange 18 on the jet body. Filter cloth 19 is fitted between the jet body 10 and the attachment 8. The spinning solution passes freely from the candle 7, through the attachment 8 and the flared mouth 9, which leads it to a circle of passages 20 in the jet body 10. Fig. 2 shows the jet body 10, the plug 11 and nut 12 separately, in the order of their assembly. The edges 21 of the plug 11 and 21' of the jet body 10 are tapered inwardly, so that the plug, forced into the jet body from outside, is firmly seated.

In Fig. 3, the plug 11 is dropped into the jet body 10 through a large hole in its upper face, and is secured by means of a member 22 having a projecting stud 23 fitting into a recess 24 in the stem of the mushroom. The member 22 is screw cut for attachment to the body 10, and may be turned by means of a suitable tool fitting into the hexagonal recess 25. The assembled jet body 10 and plug 11 are attached by means of the nut 17 to the candle attachment 8, which is screwed on to the candle. The spinning solution passes through the flared passage 9 to the passages 26, leading from the hexagonal recess to the inside of the jet. In this case the edge 21 of the plug, and the jet seating 21' are coned to taper down-

wardly, and the plug is seated firmly from within.

Fig. 4 shows three forms of jet orifices cut on one of the edges 21, 21', preferably on the edge 21 of the plug, the shapes being square at 28, semi-circular at 29 and triangular at 30. In Fig. 5 three forms of registering orifices are shown, circular at 31, 31', lozenge-shape at 32, 32' and square at 33, 33'. In this case, it is necessary that the two notches, e. g. 31, 31', which together constitute each orifice should be accurately brought together before the jet is screwed up. For this purpose an indexing mark may be provided on the jet face and jet body as shown at 34 in Fig. 6, the marks on the two parts being brought accurately into alignment before the jet is screwed up. This method enables orifices to be obtained whose cross-section could not be obtained by a notch on a single edge, for example, circular orifices as shown at 31, 31'.

Figure 7 shows a modification of the jet face member as applied to the mushroom shaped jet face described with reference to Fig. 3. In order to provide an improved conical bearing surface and to decrease the length of the spinning orifices, an annular groove 35 may be cut round the seating surface of the plug, leaving below and above it surfaces 36 and 37, in each of which notches 38, 39 are formed to constitute orifices. As described above the orifices may be tapered. Thus the notches 39 in the upper surface 37 are more deeply cut than the notches 38 in the lower surface 36, to produce a tapered effect, or a notch may be cut prior to the formation of the groove 35.

What I claim and desire to secure by Letters Patent is:—

1. A spinning jet for the manufacture of artificial filaments and the like, comprising a body member adapted to be connected to a source of spinning solution, a seat formed in said body member and a plug adapted to be received in said seat, said body member and said plug being each provided with a plurality of notches which taper towards the face of the jet and with an annular groove cutting across said notches, the notches in the one member registering with the notches in the other to form spinning orifices each constituted by two notches.

2. A spinning jet for the manufacture of artificial filaments and the like, comprising a body member adapted to be connected to a source of spinning solution, a seat formed in said body member and a plug adapted to be received in said seat, said body member and said plug being each provided with a plurality of notches which taper towards the face of the jet and with an annular groove cutting across said notches, the notches in the one member registering with the notches in the other to form spinning orifices each constituted by two notches, and indexing means on said body member and said plug for aligning said notches.

3. A spinning jet for the manufacture of artificial filaments and the like, comprising a body member adapted to be connected to a source of spinning solution, a seat formed in said body member and a plug adapted to be received in said seat, said body member and said plug being each provided with a plurality of notches which taper towards the face of the jet and with an annular groove cutting across said notches, the notches in the one member registering with the notches in the other to form spinning orifices, each constituted by two notches, and means carried by said body member and co-operating with a recess in the plug for forcing said plug into position in its seat.

4. A spinning jet for the manufacture of artificial filaments and the like, comprising a body member adapted to be connected to a source of spinning solution, a seat formed in said body member and a plug adapted to be received in said seat, said body member and said plug being each provided with a plurality of notches which taper towards the face of the jet and with an annular

groove cutting across said notches, the notches in the one member registering with the notches in the other to form spinning orifices, each constituted by two notches, said notches being of angular formation so that upon registering with one another spinning orifices of polygonal shape are formed.

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