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Charmes

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[54] **CATALYTIC SUPPORTS**

[75] Inventor: **André Charmes,** Lyon, France

[73] Assignee: **Calinter S.A.,** Geneva, Switzerland

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[58] **Field of Search** ..... 23/288 R; 29/180 S, 183.5; 431/DIG. 10; 75/20 F, 20 R; 252/477 R

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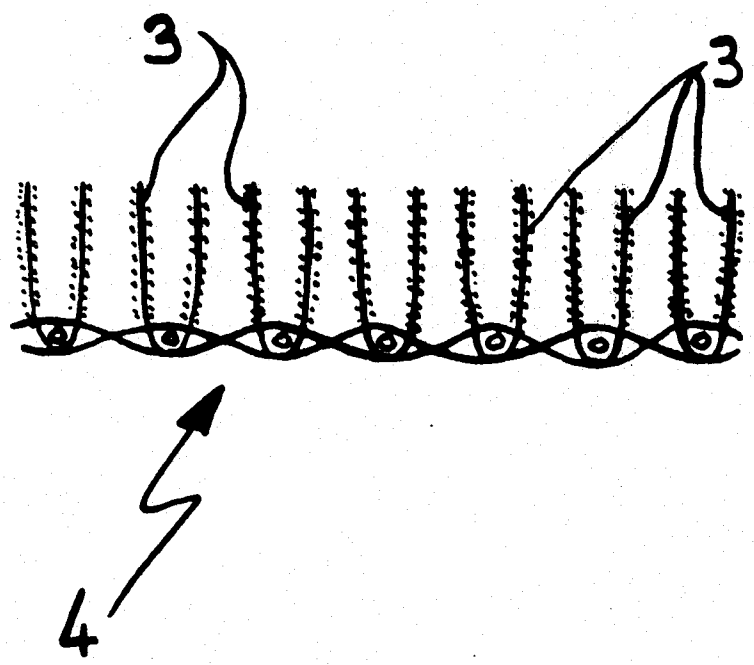
Primary Examiner—L. Dewayne Rutledge
Assistant Examiner—O. F. Crutchfield
Attorney, Agent, or Firm—Dowell & Dowell

[57] **ABSTRACT**

Catalytic support. It is constituted by metallic members (1) of which the ratio of the perimeter of their cross-section to the surface of this section is comprised between 30 and 500. These members are preferably made by means of an extruded yarn whose periphery comprises an infinite number of microscopic burrs (2).

4 Claims, 3 Drawing Figures



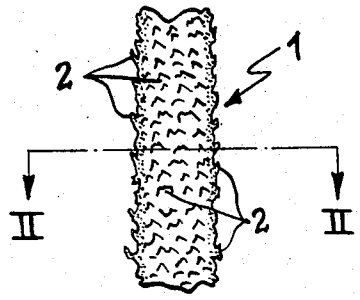


Fig. 1

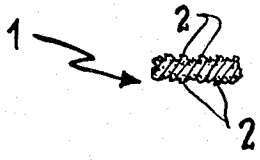


Fig. 2

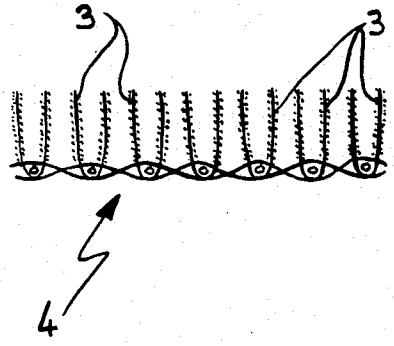


Fig. 3

CATALYTIC SUPPORTS

The present invention relates to improvements applied to supports intended to be impregnated with a catalytic material with a view to forming a catalysis burner.

Customary catalytic supports such as those made from silica-alumina wool, by means of balls or clusters of alumina balls etc. have numerous drawbacks.

Supports based on fibers have no mechanical resistance when they are heated to temperatures of the order of 700° so that they are not able to resist vibrations, in particular, at the time of the displacement of the burners on which they are installed. At the time of their impregnation, a great part of the catalyst is lost due to the fact that it does not adhere to this type of support, which causes a considerable loss of money.

Large members such as balls, and tubes are not very resistance to thermal shocks owing to temperature differences existing between the centre of the support and its outer surface and there is frequently pure and simple deterioration of these members. Moreover, they have high losses of catalytic material due to the fact that they are not porous.

It is the object of the improvements to which the present invention relates, to obviate the aforementioned drawbacks and to facilitate the provision of a catalytic support which fullfills the various requirements of the art particularly well.

The support according to the invention is namely remarkable in that it is constituted by metal members of which the ratio of the perimeter of their cross-section to the surface of this section is comprised between 30 and 500.

According to a preferred embodiment, the metal members are integral with a permeable surface and arranged perpendicularly to the latter.

The accompanying drawing, given as an example, will make it easier to understand the invention, the features which it comprises and the advantages which it is able to produce:

FIG. 1 shows a portion of the member intended for producing a catalytic support according to the invention, to a considerably enlarged scale.

FIG. 2 is a sectional view thereof on line 22 (FIG. 1).

FIG. 3 is a diagrammatic partial sectional view of one embodiment of a support according to the invention.

FIGS. 1 and 2 show a member 1 intended for producing a catalytic support according to the invention. This member 1 is, for example, in the form of a shaving coming from the machining of a part by means of a cutting tool. To give a clearer idea, the member 1 may be obtained by traversing a cylindrical work-piece on a lathe. The forwards movement of the tool is determined such that the ratio of the perimeter of the straight section of the shaving to the surface of said section is greater than 30 and less than 500.

The periphery of the member 1 comprises a multiplicity of uneven part or burrs which considerably increase the perimeter of a cross-section without increasing its surface. The aforesaid ratio may thus readily be comprised within the range given.

In order to form a catalytic support, a large number of members 1 are placed side by side in order to from a slab for example. The latter is then heated to a temperature of about 800°C in order that its members oxidize superficially; the oxide produced is perfectly adherent owing to the presence of the burrs 2. The slab is then allowed to cool and is then immersed in a solution containing the active substances of the catalyst which penetrate the porous layer of the oxide. This layer is proportional to the outer surface of each member, whereas the thermal conductivity of the latter is proportional to the surface of its cross-section. Moreover, despite a considerable contact time between the support and the solution containing the active substances of the catalyst, the latter are impregnated without excess into the layer of oxide which considerably decreases the losses of these materials. Thus, a very high volumetric weight of catalyst is obtained for a very low weight of support.

The aforesaid ratio between the perimeter of a cross-section of a member and the surface of this section thus becomes directly proportional to the ratio existing between the weights of the catalytic material deposited on the member to the actual weight of this member.

As shown in FIG. 3, the members 1 may be made in the form of extruded threads 3 whose periphery also comprises numerous microscopic burrs and which is inserted between two fabrics of any type in the manner of shaggy yarn for producing a velvet material. The sheet of extruded yarn is then cut between the two fabrics in order to form a type of velvet 4 which is then treated in the manner afore described to constitute a catalytic support.

A support is thus produced allowing the continuous operation of the burner at a temperature of approximately 800°C which is resistant to thermal shocks, which also allows a catalytic reaction which is self maintaining without the application of external heat and whose mechanical resistance is considerable. Moreover, by means of a support of this type, it is possible to generate a catalytic reaction with an oxidizable or reducable reagent whose properties vary from 2 parts per thousand to 20 parts per hundred, whereas the catalyst adheres perfectly and uniformally to this support.

It will naturally be understood that the preceeding description has been given solely as an example and in no way limits the scope of the invention, from which one would not diverge by replacing the details described by any other equivalent measures.

What is claimed is:

1. A support including catalytic material for use in a burner, comprising a mat of metallic fiberous material forming a permeable surface backing, and a multiplicity of metal filaments mounted in and extending perpendicularly from the backing, the metallic fiberous material and the metal filaments having porous oxide surfaces, and said porous oxide surfaces being impregnated with catalytic material.

2. The support as set forth in claim 1, wherein said mat of metallic fiberous backing material comprises a woven fabric, said metal filaments being hooked in the fabric and having their ends extending from at least one side of its surface to form a velvet-like structure.

3. The support as set forth in claim 1, wherein said metal filaments have surfaces roughened by microscopic burrs, whereby the area of the oxide is increased.

4. The support as set forth in claim 3, wherein the ratio of the roughened perimeter of said metal filaments to the cross-sectional perimeter of non-roughened filaments is in the range of about 30 to 500.

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