

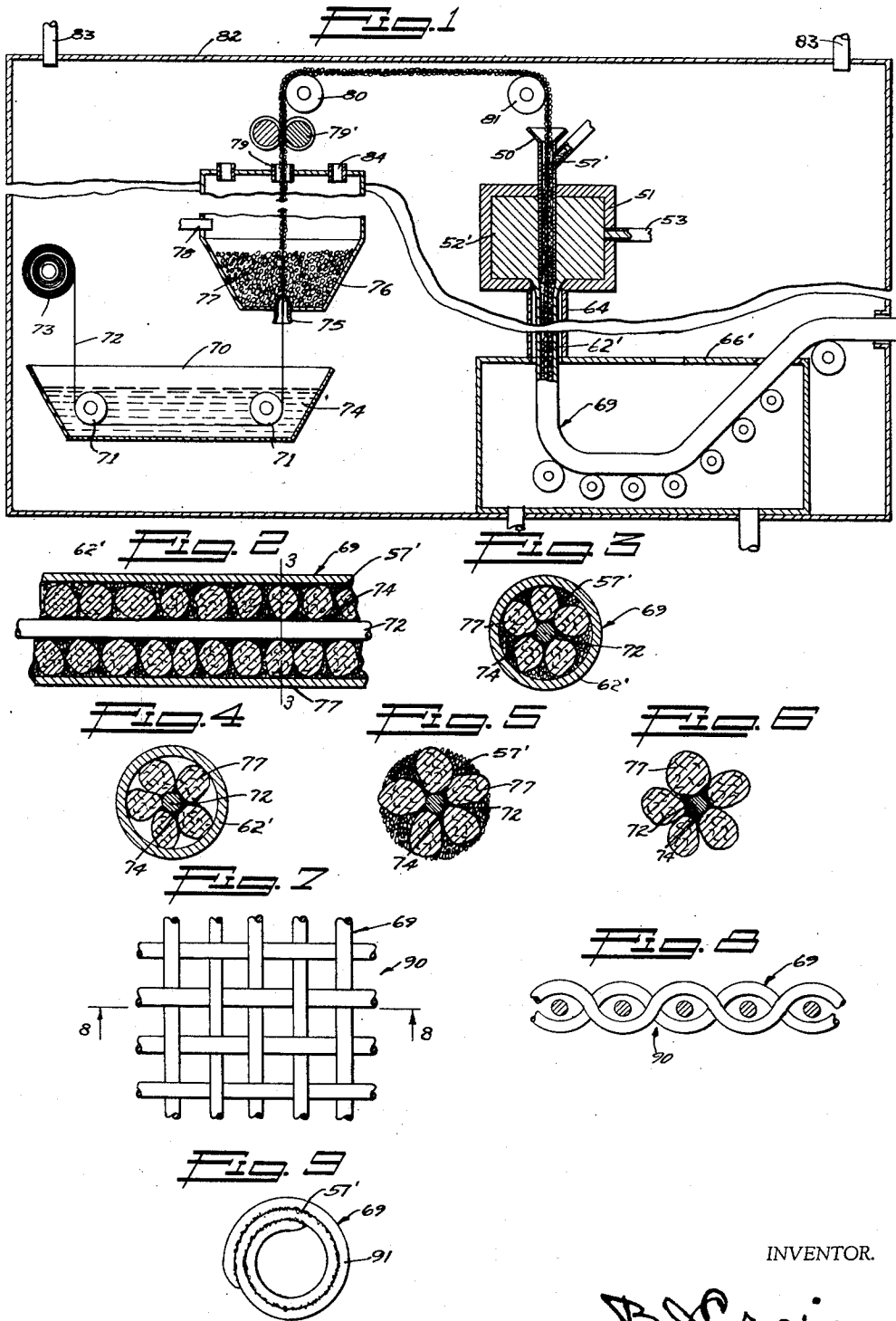
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APPARATUS FOR MAKING A THREADLIKE MEMBER

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APPARATUS FOR MAKING A THREADLIKE MEMBER

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4 Claims. (Cl. 18—4)

In the manufacture of composition cork the comminuted cork is mixed with a binder and the mixture is fed to a suitable forming machine or die. Care must be taken to insure a thorough mixing and there should be no swelling or distorting of the cork particles or any premature insolubilizing of the binder.

Also, in manufacturing cork compositions, when the binder and cork particles are mixed, there is a tendency for the binder to enter the pores of the cork and remain in the pores and there is also a tendency for the binder to enter the pores during the molding or other treating of the composition in the steps of making the finished product.

It is one of the objects of this invention to provide an apparatus for making a composite cork preparation which overcomes the difficulties mentioned.

A further object of the invention is to provide a novel apparatus for making an elongated flexible member wherein cork particles, while in an atmosphere of gas above atmospheric pressure, are mixed with a binder, after which the binder is insolubilized.

A further object of the invention is to provide a novel apparatus wherein porous particles, while containing gas, are individually or in groups covered with a film which entraps the contained gas.

An additional object of the invention is to provide an apparatus for making elongated flexible members containing porous particles and wherein the particles are provided with entrapped gas which may have a pressure greater than atmospheric pressure.

A further object of the invention is to provide a novel apparatus for making a cellular system.

A further object of the invention is to provide a novel apparatus for making a novel strand.

An additional object of the invention is to provide an apparatus for making a strand having a tension member therein.

A further object of the invention is to provide an apparatus for making a member which includes a deformable core member.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a central sectional view through an apparatus embodying the features of the invention;

Fig. 2 is a longitudinal, central, sectional view, showing the tensile member and associated parts;

Fig. 3 is a section taken on line 3—3, Fig. 2;

Fig. 4 is a view similar to Fig. 3 with the binder omitted;

Fig. 5 is a view similar to Fig. 3 with the outer cover omitted;

Fig. 6 is a view similar to Fig. 3 with both cover and binder omitted;

Fig. 7 is a plan view of a fabric embodying features of the invention;

Fig. 8 is a section on line 8—8, Fig. 7, and

Fig. 9 is a top plan view of a packing member.

In Fig. 1 an apparatus is disclosed which is adapted

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for making cellular systems 69, containing a tensile member. This apparatus includes a container 70 in which a pair of guide rolls 71 are mounted, a core, tensile member or filament is supplied from a roll 73 and passes over the rolls 71 through the container 70 which is adapted to contain adhesive material 74 through which the filament 72 passes and is coated therewith. From the container 70 the adhesive coated filament passes through an inlet tube 75 in the bottom of a container 76 which contains porous granules 77. The granules which are of a generally spherical shape adhere to the adhesive on the filament 72 circumferentially in a tubular column about the filament as shown in Fig. 1. The container 76 is provided with a supply of warm air or other drying agent from a nozzle 78 so that the adhesive is dried or cured as it passes through the upper portion of the container 76.

The filament and attached porous particles pass through an outlet 79 between rolls 79' and over rolls 80 and 81 which may be driven to suitably advance the filament. From the roll 81 the filament passes downwardly into a tube 50 which extends through a container 51 to which coating material 52' is supplied through a tube 53. The container 51 has an outlet 54 coaxial with, and of larger diameter than, the lower end 55 of the tube 50, which is disposed in the outlet 54 so that an annular passage 56 is provided through which the material is extruded. Binder material 57' is supplied by a pipe 58 which is shown as communicating with the tube 50 above the container 51.

As the filament with the porous particles thereon passes through the tube 50 it is covered with a binder 57' and as it passes downwardly coating material 52' is extruded through the tube 64 to form a tube or coating 62' which is disposed about the granule 77. The entire apparatus shown in Fig. 1 is enclosed in a housing 82 and gas under pressure is supplied to the housing from pipes 83. The air under pressure enters the container 76 through openings 84, causing the pores in the particles therein to be filled with compressed gas. The container 66' may contain a coagulating bath or evaporative atmosphere.

In Fig. 3 the cellular member is shown as including a filament 72 having adhesive 74 thereupon and having particles 77 connected thereto by the adhesive. The system also includes a binder 57' and outer cover 62'.

In Fig. 4 the construction is the same as shown in Fig. 3 except that binder 57' is omitted.

In Fig. 5 the construction differs from that shown in Fig. 3 in that the cover is omitted while in the construction shown in Fig. 6 both the covering and binder are omitted.

In Figs. 7 and 8 a fabric 90 is disclosed. This is made by weaving the cellular members 69 in a suitable manner. Other cellular members of the character disclosed in the preceding description may be employed in making the fabric. It will be understood that the fabric will be buoyant, flexible and pliant and that due to the contained porous members it will have sufficient body to permit its use for many purposes.

In Fig. 9 a packing member 91 is disclosed. This member may be made by arranging one of the strands described above in the desired shape and then securing it in this shape by means of the binder.

The porous particles may consist of comminuted cork, sponge rubber, wood pitch or natural sponge.

The entrapped gas may be air, nitrogen, hydrogen, oxygen or carbon dioxide.

The covering material may be regenerated cellulose formed from viscose, lowly etherified or esterified cellulose derivatives, soluble in aqueous alkaline solution such as lowly etherified methyl, ethyl or glycol cellulose, and lowly esterified cellulose acetate, highly esterified

cellulose derivatives soluble in organic solvents such as cellulose acetate, cellulose propionate, cellulose acetate-propionate, methyl, ethyl, ethyl or benzyl cellulose, colloidal dispersions of proteins such as casein, gelatin and the like. Other material such as artificial resins of various kinds may be used.

The covering material might also be natural rubber or a synthetic of the butadiene co-polymer type such as Buna-A rubber, a synthetic of the chloroprene polymer type, such as neoprene, a synthetic of the isobutylene polymer type having small quantities of other diolefines such as isoprene or butadiene, such as Butyl rubber or a plasticized vinyl chloride polymer, such as Koroseal. The natural or artificial rubber may be employed in latex form with the latices applied to the particles in sufficient quantities to provide the necessary thickness.

The binder and/or the material which secures the particles to the core may be a thermo setting type such as urea, phenolic or alkyd resinous materials or albumens or proteins treated with a material to insolubilize them upon heating, or other types of binders may be employed as, for example, raw natural rubber which may be vulcanized for the binding effect; also latices may be employed as binders and regenerated cellulose formed from viscose may be employed.

The covering material with the contained particles may be extruded into a coagulating bath or into an evaporating atmosphere so that the material will have the desired physical characteristics.

The core or tensile member may consist of a linen, cotton or silk thread or a rubber thread, or it may be made of wire such as copper.

This application is a division of application Ser. No. 539,589 filed June 9, 1944, now Patent No. 2,631,355, granted March 17, 1953.

Having thus described the invention, I claim:

1. In an apparatus for making an elongated, reinforced, flexible member, means to advance a flexible filament, means to arrange a group of independent, porous particles and a raw binder in a column about the flexible filament, and means to apply a continuous tubular cover over the particles and binder as they advance to unite the particles to each other.

2. An apparatus for making an elongated, filamentous, flexible member including means to advance a flexible filamentous tensile member, means to completely surround the tensile member with independent porous particles and with a binder to secure the independent particles entirely around the tensile member, an extruding mem-

ber through which the tensile member and particles run and means to supply a binder to the extruding member to distribute the binder about the tensile member and the porous particles so that the porous particles will be united to each other.

3. In an apparatus for producing an elongated, flexible, reinforced member of predetermined desired characteristics, means to continuously extrude a raw material to form a seamless tubing, means to support the tubing for continuous withdrawal from the point of extrusion, means to direct a tensile member having gas containing independent particles secured thereto, into a section of the tubing adjacent to the point of extrusion, and means to pass the tubing, while in the raw formative state, through a finishing pressure controlled medium in the vicinity of the point of extrusion to finish the tubing.

4. In an apparatus for producing an elongated, flexible, reinforced member of predetermined desired characteristics, means to continuously extrude a raw material to form a seamless tubing, means to support the tubing for continuous withdrawal from the point of extrusion, means to direct a tensile member having gas containing independent coated, porous, particles secured thereto, into a section of the tubing adjacent to the point of extrusion, the quantity of gas in the particles being such as to expand the tubing while in the raw to a predetermined desired degree at a point beyond the point of extrusion, means to pass the tubing while in the raw formative state through a finishing pressure controlled medium in the vicinity of the point of extrusion to finish the tubing to an extent that when the tubing has been expanded by said gas containing particles to the said predetermined degree it will be in set condition, the degree of expansion of the coated porous particles and the degree of gaseous pressure about the tubing during finishing of the tubing all being correlated in accordance with predetermined desired physical characteristics of the tubing.

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