June 1, 1943. H. D. HALEY 2,320,591

SPINNING FUNNEL

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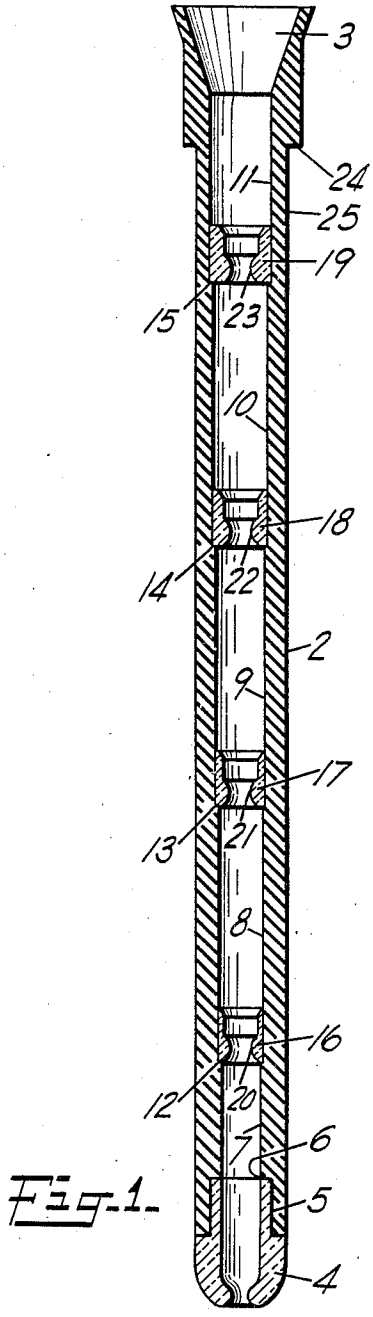


Fig-1-

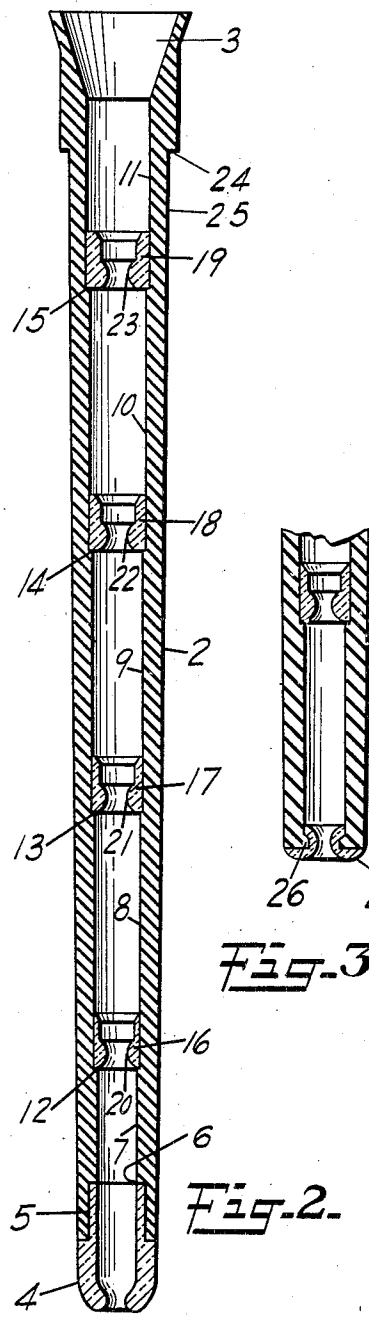


Fig-2-

Fig-3-

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SPINNING FUNNEL

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3 Claims. (Cl. 57—76)

This invention relates to an improved funnel adapted to be used in artificial silk spinning machines for directing an artificial silk filament into the center of a centrifugal spinning box where the filament is wound in the form of a cake.

Although funnels of this type have heretofore been made of plastic materials, it is an object of this invention to provide a novel structure peculiarly adapted for formation of such funnels from plastic materials. It is also an object of the invention to minimize the number of joints in the funnel structure so that less care need be expended upon the funnel to insure that the interior surfaces thereof are free of irregularities upon which the filamentary material may be subjected to undue wear or tearing. A further object of the invention is to provide the internal surface of the main funnel body with seats at desired intervals upon which may be supported beaded ring inserts to prevent the filamentary material from dragging on the side walls of the funnel tube. Further objects of the invention will be apparent from the drawing and the description thereof.

Figure 1 of the drawing illustrates in section one form of the invention.

Figure 2 illustrates in section a modification.

Figure 3 shows a modified form of tip structure.

The embodiment shown in the drawing, referring particularly to Figure 1, comprises a main body portion 2 having the bell-shaped funnel mouth 3 integral therewith, and a tip section 4 telescoped at 5 within the lower end of the main body portion so that its internal surface is flush with that of the interior surface of the main body portion where they meet at 6. The internal surface of the main body portion of the funnel comprises several distinct sections 7, 8, 9, 10 and 11 separated by small steps or shoulders 12, 13, 14, and 15, each section being of slightly larger diameter in order from the bottom of the tube to the top. These steps or shoulders provide seats for beaded ring inserts 16, 17, 18, and 19 which have outside diameters of different sizes increasing from the lowermost insert to that uppermost in the tube. The ring inserts provided with the beads 20, 21, 22 and 23 are readily inserted into their respective positions through the top of the funnel in order, the lowermost being inserted first. These inserts may be cemented in place, or each section of the tube may have a slightly tapering inside diameter so that each ring insert fits tightly at the bottom of its respective section.

While the outside diameter of the main body of the funnel tube is shown in Figure 1 as being substantially constant throughout the length of the tube, disregarding any slight amount of taper that is absolutely necessary to permit the tube to be removed from a mold when a molding process is employed in making the funnel tube of a synthetic resin, nevertheless the outside of the tube may be given a somewhat increased taper from a narrow outside diameter at the bottom to a somewhat greater outside diameter at the top so that the average thickness of the tube throughout any given section is substantially equal to the average thickness of the tube in any other section along the length thereof as is shown in Figure 2.

The head portion 3 of the funnel is provided with a shoulder 24 for seating the funnel in the reciprocating apparatus commonly employed in artificial silk spinning machines. The head bushing commonly employed about glass funnels to absorb the shock transmitted by the reciprocating apparatus may be omitted as the neck portion 25 is sufficiently resilient and tough to absorb whatever shock occurs in the funnel bearing means of the reciprocating apparatus. If desired, the neck portion 25 of the tube just below this shoulder may be provided with a screw thread adapting the funnel to be screwed directly into a complementary member of the bearing means supplied in the customary artificial silk spinning machines.

The various parts of the funnel are made of acid and alkali resistant materials. If desired, the entire assembly may be made of synthetic resins, such as polyvinyl resins, for example, polyvinyl chloride, polystyrene resins, phenol-formaldehyde resins, phenol-furfural resins, methacrylate resins, synthetic rubbers, or hard rubber itself. Preferably, however, the tip portion 4 should be made of glass, porcelain, agate, lava or similar material of which it has been customary to make the tips of such funnels heretofore. The inserts may be made of synthetic resins or of glass, porcelain, or similar material. Preferably, though not necessarily, the tube should be made of a transparent material, polyvinyl resins and the polystyrene resins, for example, being sufficiently transparent for the purposes of this invention. The employment of the synthetic resins has the advantage over glass of reducing breakage and the cutting of the spinning boxes that ordinarily occurs upon breakage of the funnels. The resilience of the resin funnels also accounts for reduced breakage whenever it happens that a yarn wraps about the funnel tip itself.

Figure 3 shows a modification in which the

lowermost extremity of the funnel 2 is molded with an inwardly extending foot 26 directly into the tip 27.

While there have been described preferred embodiments of the invention, it is not intended to be limited to the details of such preferred embodiments which are merely illustrative, but various modifications may be employed within the spirit and scope of the following claims.

I claim:

1. A funnel comprising an integral tube having a plurality of sections, each section having a different inside diameter, said diameter being of larger size in each successive section from one end to the other of said tube, and a beaded ring in each section having an outside diameter substantially equal to the inside diameter of its respective section.

2. A funnel comprising an integral tube having a plurality of sections, each section having a different inside diameter, said diameter increasing in size in each successive section from one end to the other of said tube, shoulders at the junctions between said sections, and a beaded ring in each section seated against a corresponding shoulder, said ring having an outside diameter substantially equal to the inside diameter of its respective section.

3. A funnel comprising an integral tube having a plurality of sections, each section having a different inside diameter, said diameter increasing in size in each successive section from one end to the other of said tube, shoulders at the junctions between said sections, a beaded ring in each section seated against a corresponding shoulder, said ring having an outside diameter substantially equal to the inside diameter of its respective section, the average thickness of the tube through a given length of each section being approximately equal to that of the corresponding length of each of said other sections.

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