Feb. 12, 1935. E. D. MacARTHUR 1,990,556

FUNNEL

Filed Dec. 30, 1932

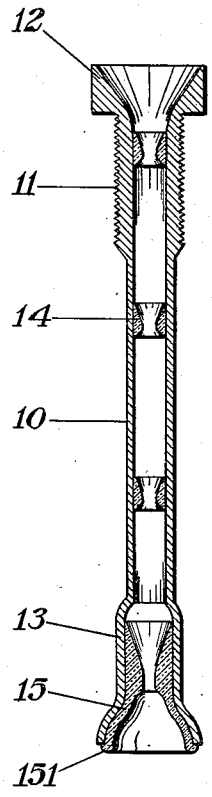


Fig. 1

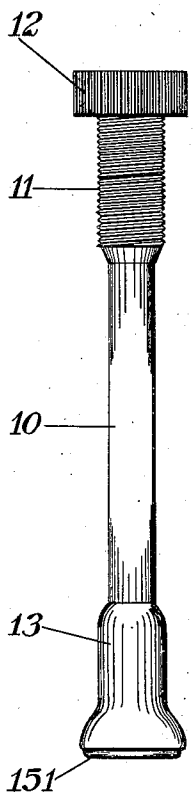


Fig. 2

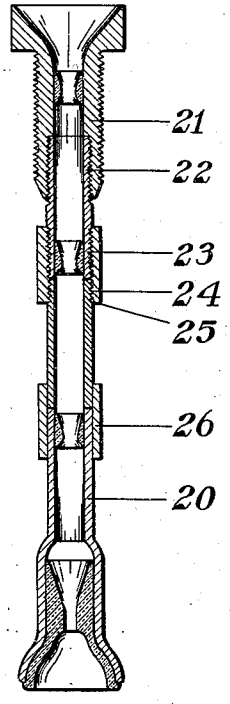


Fig. 3

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FUNNEL

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6 Claims. (Cl. 118—49)

It is an object of this invention to improve the manufacture of rayon. Another object of the invention is to provide an improved funnel guide. Other objects of the invention will be in part apparent and in part hereinafter set forth.

The objects of the invention are attained, generally, speaking, by the use of a funnel of hard rubber or similar material having spaced inserts of porcelain or similar material. The objects of the invention are attained, specifically speaking, by the means, method, and details of construction of the forms of the invention hereinafter disclosed.

In the drawing Figure 1 represents a cross section through a funnel constructed in accordance with my invention. Figure 2 is an exterior view of the same funnel. Figure 3 illustrates means of repairing a broken funnel.

In Figures 1 and 2, 10 is a funnel; 11 is a screw thread, formed integrally with the funnel, for mounting the funnel in the reciprocating mechanism; 12 is an enlarged and preferably knurled portion of the funnel to assist the operator in adjusting the funnel axially of the bucket; 13 is an enlarged portion at the end of the funnel from which the thread leaves; 14 are porcelain inserts within the funnel to prevent contact of the thread with the funnel walls and to center the thread during its passage through the funnel; 15 is a porcelain facing for the inside of the enlarged portion 13 of the funnel, of which the edge 151 forms the point of incidence of the thread.

The funnel can be made of suitable plastics among which may be mentioned hard rubber, gutta percha, vinyl resins, phenol-formaldehyde resins, polyhydric alcohol-polybasic acid resins, and cellulose derivatives. The best compositions of these various substances for this purpose will be known to persons acquainted with the respective arts. The guide or guides may be made of other materials than porcelain; for instance agate or other materials having a hard and smooth surface and which are inert to the action of the coagulating bath may be used.

Another advantage of the funnel is that the use of a porcelain mouthpiece minimizes the quantity of rayon damaged by contact with a rough funnel lip. When the porcelain funnel mouth strikes the revolving bucket cover, which not infrequently happens when the doffer is raising or lowering the funnel in the bucket, the edge may be nicked or a particle of the bucket cover may be vulcanized to the funnel lip. As the rayon slides and revolves over this rough portion the thread is damaged. With a glass funnel it is difficult to detect these flaws but with the wide porcelain mouthpiece a black spot is made wherever the porcelain strikes the bucket cover notifying the operator of the damage.

Another advantage of the funnel is in mounting and alinement. Glass funnels are mounted in a rubber bushing with a fit which is usually so bad that the jarring of the traverse mechanisms causes the funnel lip to pull away from the center of the bucket making kinks in the thread. The elimination of the bushing and the casting of the screw threads directly in the funnel simplifies the mechanism, and insures a rigid mounting which cannot get off-center.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments thereof except as defined in the appended claims.

I claim:

1. In a thread guide a hard rubber funnel enlarged at both ends, a porcelain facing for the interior and lower edge of the funnel, and porcelain inserts spaced within the funnel whereby thread passing through the funnel will be properly centered and prevented from contacting with the funnel walls.

2. In a funnel guide a hard rubber funnel having a threaded portion for cooperation with a threaded portion in a reciprocating bar, and porcelain facings for the interior of said funnel whereby thread guided thereby will be centered and provided with a minimum number of low friction places of contact.

3. In a guide a tube of hard rubber, and carried therewithin spaced porcelain guides arranged to prevent contact of thread and tube.

4. In a guide a tube of hard rubber, and carried therewithin spaced agate guides arranged to prevent contact of thread and tube.

5. In a funnel guide, a hard rubber funnel having an enlarged end, a polished porcelain facing for the portion of the enlargement which may be touched by the thread, and porcelain rings within the funnel spaced from one another sufficiently to provide a minimum number of frictional contacts for the thread but being close enough to one another to prevent the thread from contacting the wall of the funnel.

6. A funnel guide having more than one section, adjacent sections being connected by a sleeve, and means within the funnel to prevent the contact of thread with the joint.

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CERTIFICATE OF CORRECTION.

Patent No. 1,990,555. February 12, 1935.

ELVIN DAVID MacARTHUR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, before line 1, insert the following paragraphs:

This invention relates to reciprocating funnels such as are used in the manufacture of rayon to introduce a thread into a revolving bucket. This invention will be described in its application to the manufacture of rayon but it is to be understood that this description is given for facility only and that the invention is applicable to all cases in which a guide is used for the transference of thread.

In one of the methods of manufacturing rayon the regenerated cellulose thread is collected in a centrifugal bucket which revolves at high speed. Within the bucket the thread is built up into the form of a hollow cake. In order that the thread may be laid in the cake evenly and in order that it may be readily unwound when withdrawn from the bucket, a reciprocating mechanism is used whereby the thread is laid against the walls of the bucket in superimposed helices. Heretofore glass funnels having their lower ends projecting into the bucket have been mounted on reciprocating bars to serve as thread guides. These funnels are made from selected pieces of glass tubing and vary greatly as to outside and inside diameter and wall thickness. It has been necessary to form constrictions at intervals in the funnels in order to keep the thread centered and to prevent the wet thread from dragging against the glass. The presence of these constrictions weakens the funnels and, in combination with the natural brittleness of the substance, makes a funnel which breaks easily, necessitating frequent replacements. Pieces of glass flying from the broken funnel often cut the inside of the bucket and damage the rayon.

After line 34, insert the following paragraphs:

In Figure 3, 20 indicates the funnel generally, 21 indicates the portion of the funnel which the thread enters; 22 indicates screw threads by which the portion 21 of the funnel is attached to the portion 20; 23 is a line indicating a break in the funnel; 24 indicates screw threads in abutting ends of the broken sections; 25 indicates an interiorly screw-threaded sleeve by cooperation with which the sections of the funnel are repaired; 26 indicates a repair made by swelling (as by heat) a section of hard rubber of an interior diameter approximately equal to the exterior diameter of the funnel sections until it can be placed over the break in the funnel and thereafter shrinking it into place.

In the practice of my invention the funnel is mounted in a reciprocating bar or other reciprocating mechanisms by means of screw thread 11 and is adjusted in its relation to the bucket by means of that screw thread. After the adjustment it can be locked in position by means of a lock nut (not shown), if desired. The operator passes the thread through the funnel into the interior of the revolving bucket where it is picked up and formed into a cake in the manner known to those skilled in the art.

After line 46 insert the following paragraph:

An advantage of this invention is a reduction in funnel breakage and cost of replacement. Another advantage of the funnel is that, if it breaks, it does not shatter and score the interior of the bucket.

Second column, after line 15, insert the following paragraph:

Another advantage of the funnel is the matter of salvage. Whereas the damaging of a glass funnel permanently destroys its utility, funnels made according to my invention, when broken, may readily be salvaged as hereinabove described in connection with Figure 3.

And that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of April, A. D. 1935.

(Seal)

Leslie Frazer
Acting Commissioner of Patents.