Aug. 15, 1944. J. K. BERRY 2,356,026

REELS

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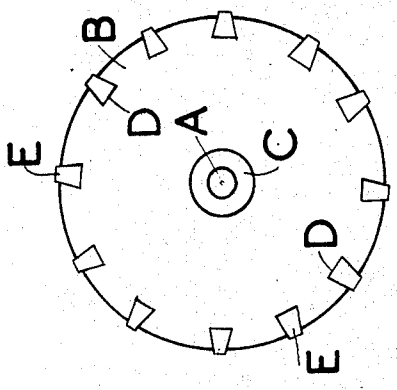


FIG. 2.

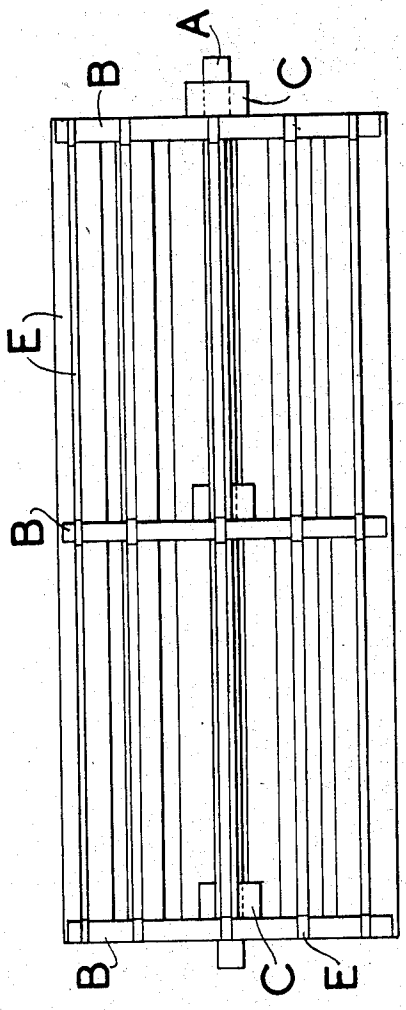
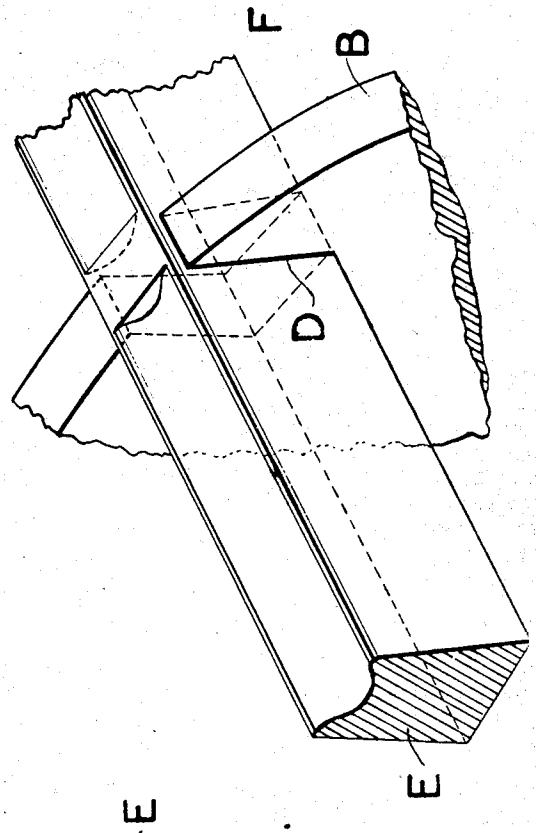


FIG. 1.

FIG. 5.



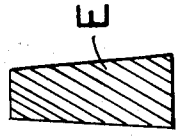


FIG. 4.

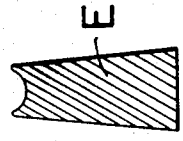


FIG. 3.

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REEL

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2 Claims. (Cl. 68—212)

This invention relates to a reel for use in treating artificial filaments, threads, fibres and the like, hereinafter referred to as threads, and is particularly adapted for treating a thread with a number of different liquids in succession, while the thread is carried by and is travelling along a thread-advancing device.

It has already been proposed to produce a thread by extruding a thread-forming solution such as viscose into a coagulating bath and then to pass the thread as it leaves the coagulating bath into contact with a succession of different treating liquids, such for instance as washing, desulphiding, bleaching, and final washing liquids, and then to dry the thread, so that it is, in one continuous operation, produced as the finished thread, ready to be employed for textile purposes. It has been proposed to carry out the treatment of the thread with the different liquids on a succession of rollers, one roller or set of rollers being employed for each operation, and each roller or set of rollers dipping into, or being sprayed with the required liquid.

It has also been proposed to pass the thread leaving the coagulating bath on to a device or series of devices adapted to advance the thread in a large number of helical turns. Such devices may consist of a pair of rollers with inclined axes, or of one roller and a series of guide hooks, or of a single reel comprising two sets of interdigitating bar members. When the thread travelling along the thread-advancing device is treated with a succession of different liquids, such as those enumerated above, large quantities of the treating liquids are required as only a single thread or at the most a small bundle of threads, is treated on each device. In order to carry out the process economically it is necessary to provide means for recovering the used liquids, and circulating them for re-use. When the treatment with each liquid is carried out on a separate device, this is comparatively simple, but when the thread is treated with several different liquids on one device, the liquids are liable to intermix and become unsuitable for further use in that particular zone of treatment.

It has further been proposed to treat thread travelling on a thread-advancing reel with a succession of different liquids and to collect the liquids separately by providing suitable means which allow the liquids to drop off into separate collecting compartments. For example, the bars of the reel may be provided with ribs on the outer face of the bar so that liquid running down the bar is caused to drop off on reaching the ribs; or holes may be provided on the outer face of the bars; or an air jet may be employed.

I have now found that I can treat a travelling thread with a succession of different liquids and collect the liquids separately by using a reel consisting of a plurality of longitudinal bar members fitting into slots in a number of spaced solid discs mounted on a shaft, said bar members being grooved along most of their length except at those points where the bar members fit into the slots in the solid discs.

The thread may be made to travel along the reel in a large number of advancing helical turns by any of the well known methods. For example, two reels may be used with their axes inclined at a slight angle, or one reel may be used in conjunction with a series of guide hooks, or a single reel may be used comprising two sets of interdigitating bar members with a slight modification of the discs supporting the bar members, to allow for the reciprocating movement of the bars.

The solid discs are preferably flat and circular and are provided round their circumference with a plurality of slots which may be tapered and are adapted to accommodate the bar members. It is desirable to have the bar members slightly greater in depth than the tapered slots so that the thread will remain clear of the outer circumference of the discs between the bars. The discs and bar members are constructed of material resistant to the treating liquids.

The solid discs and those parts of the bar members which are not grooved provide a substantially liquid impervious barrier, so that the reel is divided into a number of zones and a different treating liquid may be applied ty sprinkling to each zone, the liquids remain separate and can be collected in suitable devices placed beneath each zone. The length of each zone is defined by the length between two successive discs. In the treatment of a freshly spun viscose thread, for example, a reel may be used made from longitudinal bar members according to the present invention supported on six solid discs. Such a reel will have five treating zones, to which five different liquids may be applied, for example, water may be applied in the first zone, a desulphiding liquor in the second, followed by water in the third, a bleaching solution in the fourth, and a final washing water in the fifth zone. In this way the thread is washed, desulphided and bleached in a continuous operation. The washing liquids, desulphiding liquor and bleaching so-

lution are recovered and circulated in any desired and suitable manner.

The drawing accompanying this specification, will assist in illustrating the nature of this invention, but the invention is not restricted to the method and apparatus shown in the drawing.

The drawing shows—

In Figure 1 an elevation of a reel according to this invention;

In Figure 2 an end view of the reel of Figure 1;

In Figures 3 and 4 sections of the bar member at different points and

In Figure 5 a perspective view of part of a bar member and part of a disc.

The reel consists of a shaft A, capable of being rotated by means not shown, on which are mounted a number of circular discs B provided with hubs C by which they are keyed to the shaft A in any convenient manner.

The discs B are provided with a number of peripheral slots D for the reception of longitudinal bar members E.

Between the discs B, the bar members E are provided with a groove in their outer surface, but the portions of the bar members E immediately adjacent the periphery of the discs B are not grooved. This is clearly shown in Figure 5. Thus at any point between the discs B, the bar members E have a cross section as shown in Figure 3, whereas immediately adjacent the discs B the bar-members have a cross section as shown in Figure 4.

If a thread is caused to travel in a helix along the reel shown in Figure 1 it may be subjected to treatment with two different liquids by arranging suitable spraying means above the reel to the left and the right of the middle disc B, and the treatment liquids may be collected separately by arranging troughs beneath the reel to the left and to the right of the middle disc B. Obviously by making the reel longer, and providing a greater number of discs B, the thread may be treated with any desired number of different treatment liquids.

Treatment liquid is prevented from running along the outer surface of the bar members E from one side of a disc to the other by the ungrooved portion of the bar member which forms a kind of barrier as clearly to be seen in Figure 5. It is thus possible to collect the treatment liquids separately without any substantial mixing with adjacent treatment liquids.

The bar members E are of such a thickness that they project slightly beyond the periphery of the discs B as may be seen from Figures 2 and 5. It is therefore impossible for the thread to foul the periphery of the discs B as it moves along the bar members E.

What I claim is:

1. A reel suitable for treating a travelling thread with a succession of different liquids and collecting the liquids separately comprising a shaft, a plurality of solid discs mounted in spaced relationship on said shaft, a plurality of peripheral slots in each of said discs a plurality of longitudinal bar-members fitting in said slots and adapted to support the travelling thread, the portions of said bar-members between each two successive discs constituting a zone of liquid treatment, and longitudinal grooves in said bar-members, said grooves not extending beyond the ends of said zones of liquid treatment whereby treatment liquid in said grooves is prevented from passing from one zone of liquid treatment to the next.

2. A reel according to claim 1 in which the solid discs are circular.

JOHN KENNETH BERRY.