July 8, 1947. S. C. NELSON 2,423,721

BUCKET SPINNING GUIDE

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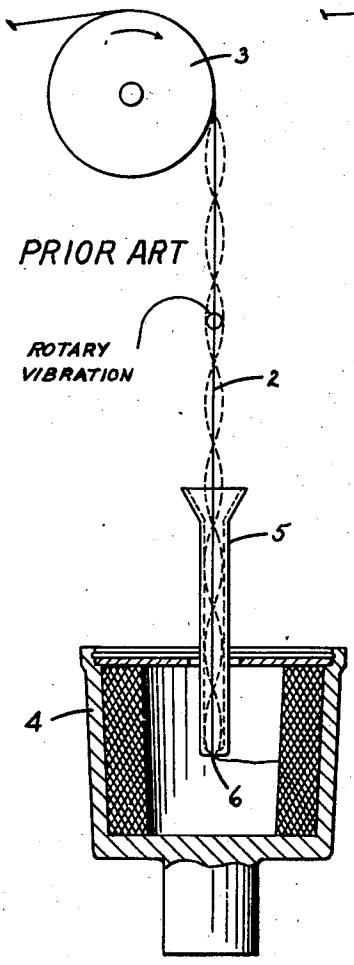


Fig. 1

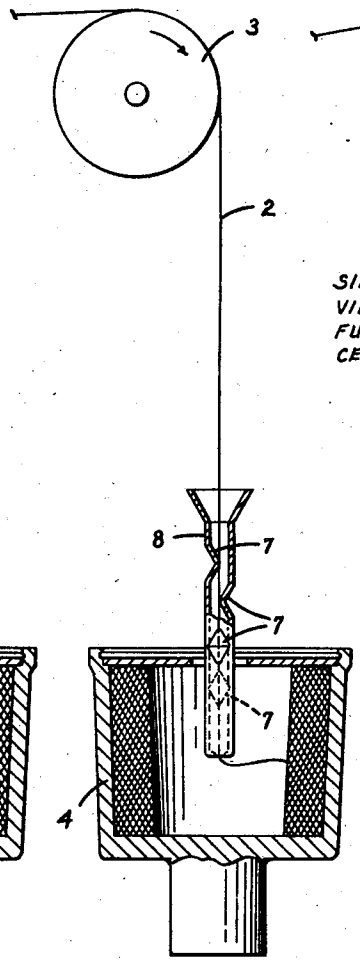


Fig. 2

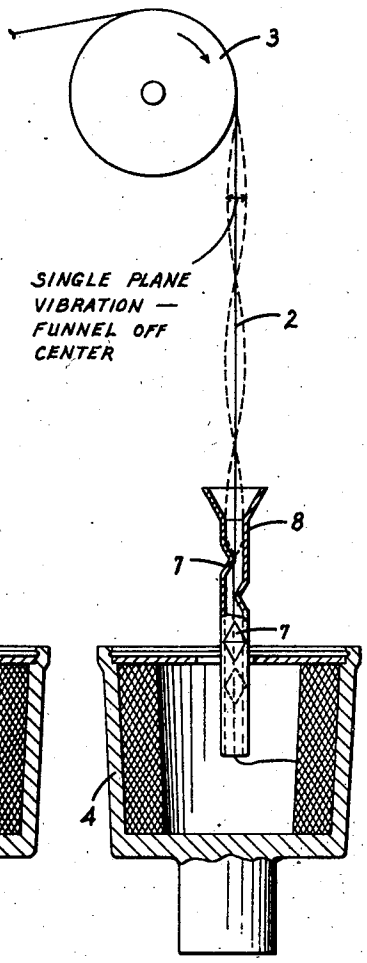


Fig. 5

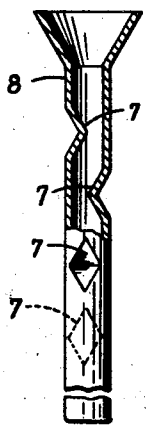


Fig. 3

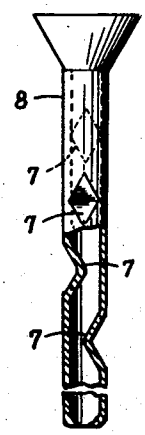


Fig. 4

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BUCKET SPINNING GUIDE

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2 Claims. (Cl. 57—76)

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This invention relates to an improved guide for introducing continuous filaments, such as those being produced on an artificial filament spinning machine, into a spinning bucket or centrifugal pot.

The normal bucket or pot spinning process involves extruding a spinning solution, such as of viscose, through a coagulating medium to form threads composed of a number of filaments. These threads are then withdrawn from the coagulating medium, stretched between driven godets in the usual manner, and collected in a rapidly rotating bucket. A thread-guide or spinning funnel is mounted for reciprocation of its lower end axially of the bucket, and this funnel is adapted to guide the thread into the bucket in a manner to cause the thread to be laid up in the form of a cake, due to the centrifugal force created by rotation of the bucket.

In practicing the bucket or pot spinning process in which a standard type spinning funnel is utilized, it has been found that the thread as it is fed into the bucket from the last godet with which it contacts will normally commence twisting or ballooning at the lower outlet of the funnel, and this action is carried back to the godet wheel as a vibration having the same frequency as the speed of rotation of the thread course extending between the funnel outlet and inside cake wall. When the funnel is off-center, that is, positioned eccentric of the spinning bucket, another vibration wave having half the frequency of that caused by the rotation of the thread around the lower outlet of the funnel is superimposed thereon. Such twisting or ballooning action causes vibrations or fluttering to exist in the thread which tend to disturb the smooth passage of the thread. Furthermore, due to the vibrations acidic treating liquids are thrown therefrom. These liquids precipitate salts on the surrounding apparatus and additionally the acids will corrode any metallic parts with which they come in contact.

It has heretofore been suggested to provide one or more rods across the mouth of the funnel to dampen the vibrations. However, such arrangements have not produced sufficient improvement to come into general use. Some amelioration could be obtained by making the outlet opening of the funnel of small diameter approaching the diameter of the thread, but lacing difficulties then became too serious to make this solution practical.

It is the object of the present invention to provide an improved thread-guide which eliminates

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substantially entirely all the vibration in the thread above the funnel caused by the rotation of the thread leaving the funnel. A further object is to provide a guide which eliminates the vibration just mentioned so completely that any off-center position of the guide is immediately perceptible to the naked eye simply by virtue of the distinct vibration thus induced. Further objects and advantages will be apparent hereinafter.

In the drawing which is illustrative of the invention,

Figure 1 is an elevation illustrating the operation of a conventional funnel thread-guide;

Figure 2 is a similar elevation illustrating the proper operation of a guide of the present invention;

Figure 3 is an elevation of a preferred form of guide embodying the present invention;

Figure 4 is an elevation of the guide looking at it from a direction 90° from that by which Figure 3 is obtained; and

Figure 5 is an elevation illustrating the operation of a guide of the present invention when indicating an off-center position of the guide with respect to the bucket.

In Figure 1, the vibrations of the thread 2 proceeding from godet 3 to the rotating spinning bucket 4 through the conventional funnel guide 5 are indicated by the dotted lines which proceed upward from the thread outlet 6 of the guide. The effect produced appears to the naked eye as a blurred rapidly fluttering or vibrating thread.

Figures 2 to 4 show a guide embodying the present invention in which at least four projections 7 extend inwardly in as many directions from longitudinally spaced portions of the wall of the tubular body 8 of the guide. The innermost portion of each projection has the form of a ridge extending transversely across the guide and when it is desired that the thread pass approximately centrally through the body of the guide, the projections extend either through its axis or preferably through points somewhat beyond its axis and the ridges of at least two of the projections are arranged to extend transversely and in the preferred embodiment substantially at right angles, to those of at least two other projections, so that the thread in passing through the guide must continuously contact all the ridges and is deflected from a straight path through the guide to a zigzag path by the projections. It is not essential that the guide be cylindrical or that the thread pass

through its center or axis, though this embodiment is preferred from a practical standpoint. Figure 2 shows the effectiveness of the guide in preventing the development of vibrations because of the rotation of the thread leaving the outlet of the guide. This effectiveness is apparently the result of one pair of parellel ridges preventing vibrations in any plane except that of the ridges, while the other pair of ridges supplements this action by preventing vibration in the plane of the first pair of ridges.

As shown in Figures 3 and 4, the parallel ridges of each pair are adjacent to each other.

The projections may be formed in glass or thermoplastic resin guides merely by pressing indentations into the glass or resin tube while in a heated plastic condition. Alternatively, suitably shaped projections may be inserted into tubular guides and cemented into place at spaced intervals therein. The distance between ridges is generally not critical, and it may be from about ½ inch to 1 inch even up to 2½ inches or more.

The guide of the present invention does not interfere greatly with the vibrations resulting from eccentric disposition of the guide with respect to the bucket because they are caused by alternate changes in tension as the thread leaving the guide must take a greater or shorter path to reach the cake winding and thereby exerts greater or less centrifugal force. As illustrated in Figure 5, these vibrations become readily apparent to the operator who immediately recognizes that the guide requires centering. In this manner, the guide of the present invention itself becomes a highly efficient "tell-tale" as to improper centering of the guide.

It is to be understood that the description herein is illustrative only and that changes and variations may be made without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A thread guide having a tubular body providing a longitudinal passage for the thread, at least four projections longitudinally spaced within the passage, each extending inwardly in one of four directions at least through the axis of the passage and having a ridge extending transversely of the passage and adapted to engage the thread, the ridges of at least two adjacent projections being parallel and at least two other adjacent ridges being parallel and substantially at right angles to the first-mentioned parallel ridges.

2. A thread guide having a tubular body providing a longitudinal passage for the thread, four projections from the inside wall of the body longitudinally spaced within the passage, each extending inwardly in one of four directions beyond the axis of the passage and having a ridge extending transversely of the passage and adapted to engage the thread, the ridges of two adjacent projections being parallel and two other ridges being parallel and arranged substantially at right angles to the first-mentioned parallel ridges.

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REFERENCES CITED

The following references are of record in the file of this patent:

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330,130	Great Britain	June 5, 1930