March 3, 1959 H. W. MATTHEWS ET AL 2,875,502

APPARATUS FOR CURLING TEXTILE YARNS

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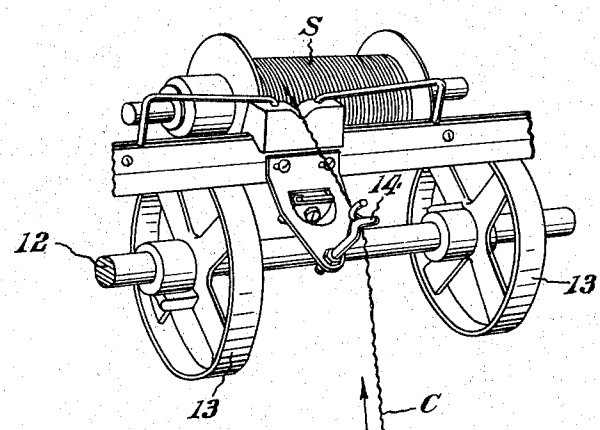


FIG. 1.

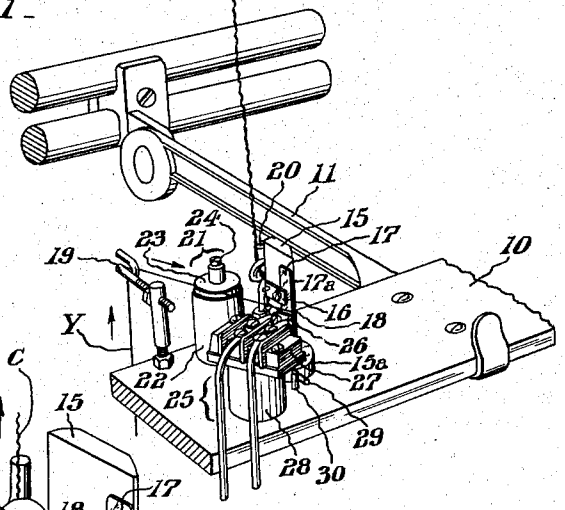
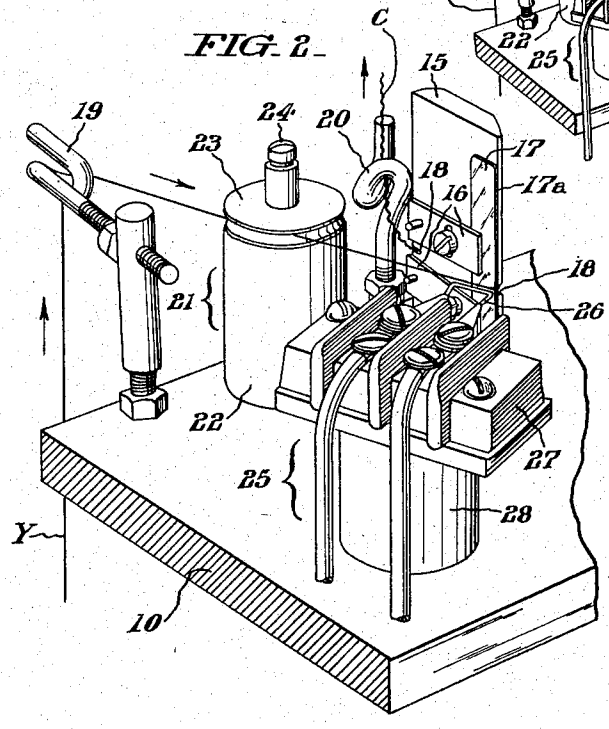


FIG. 2.



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FIG. 3

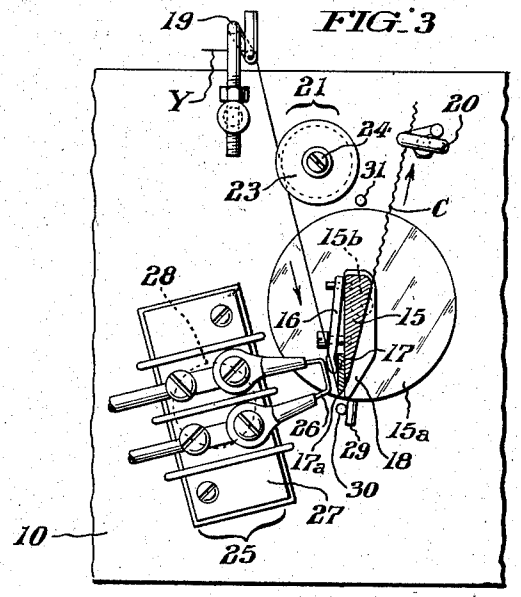


FIG. 6

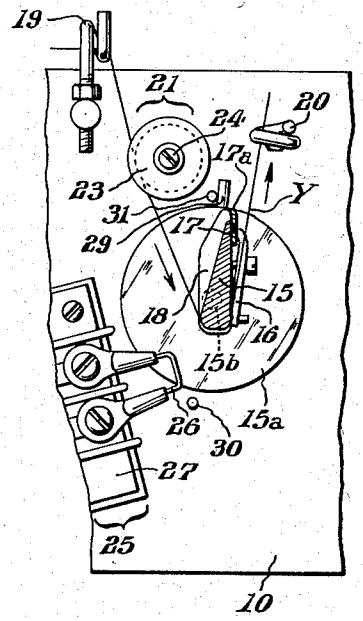


FIG. 4

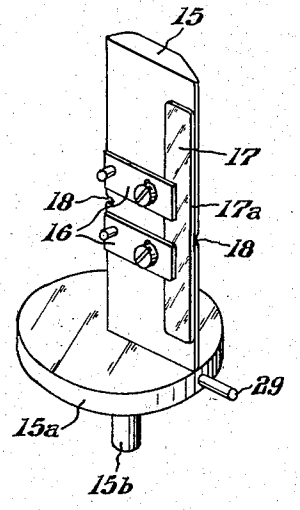
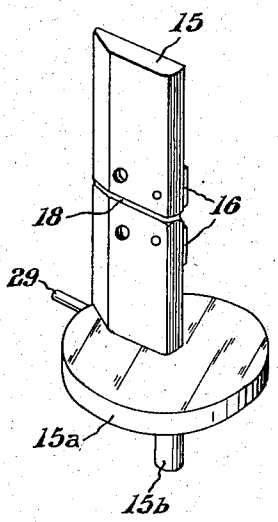


FIG. 5



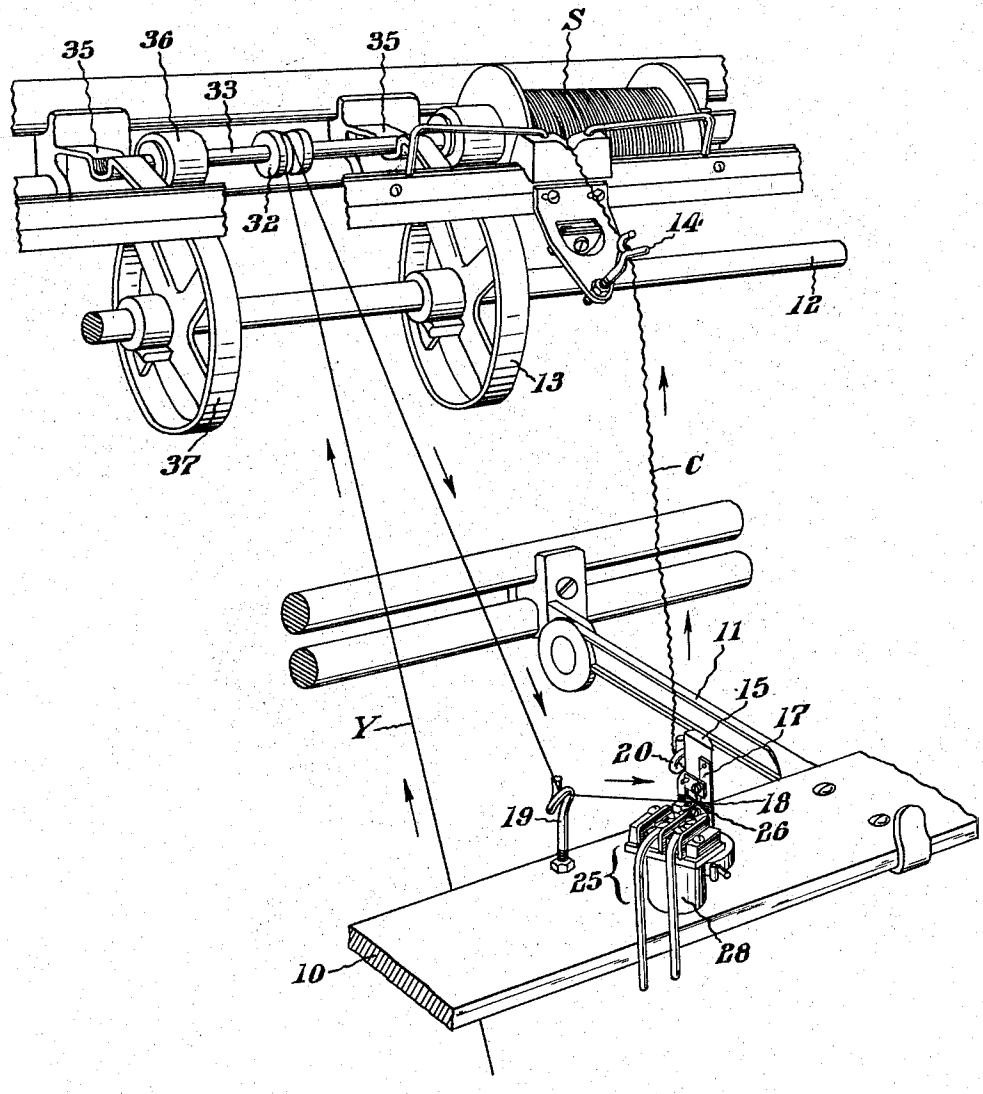
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FIG. 7.



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APPARATUS FOR CURLING TEXTILE YARNS

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Application April 10, 1953, Serial No. 347,979

4 Claims. (Cl. 28—1)

This invention relates to apparatus for curling textile yarns, particularly synthetic yarns of nylon and the like.

The chief aim of our invention is to provide a simple and reliable apparatus for curling textile yarns, of the kind referred to, continuously and rapidly incident to winding them on spools or cops in preparation for use in the production of woven or knitted fabrics.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings wherein:

Fig. 1 is a fragmentary view in perspective of a yarn curling apparatus conveniently embodying my invention.

Fig. 2 is a fragmentary view of a portion of the apparatus, likewise in perspective, drawn to a larger scale.

Fig. 3 is a fragmentary view in top plan with the curling element of the apparatus shown in horizontal section.

Figs. 4 and 5 are perspective views of said element.

Fig. 6 is a view like Fig. 3, but showing the curling element retracted to facilitate initial threading of the yarn in the apparatus; and

Fig. 7 is a view like Fig. 1 showing an alternative embodiment of our invention.

As herein exemplified, our improved yarn curling apparatus comprises a support in the form of a plank **10** which is horizontally sustained by arms **11** at the front of a winding mechanism, said mechanism including a longitudinal shaft **12** with drive wheels **13** for rotating a take-up spool S whereon the yarn Y is collected after being curled, and a traversing guide **14** for distributing the yarn on the spool. Mounted on plank **10** is a flat sided post **15** which is wedge shaped in cross section, radial to and rigid with a circular base **15***a* having a pendent axial stem **15***b* (see Figs. 4 and 5) engaged downwardly into said plank. Clamped to one side face of the post **15** by a pair of vertically-spaced screw secured plates **16** is a vertically arranged knife-like blade **17** having a sharp edge **17***a*. As shown, the blade **17** is so adjusted that its edge **17***a* projects somewhat beyond the wedge edge of the post.

In the interval between the clamp plates **16**, the post **15** is provided, for a purpose presently explained, with a narrow groove **18** which extends transversely of one side and of the front and back of said post. Stationed respectively beyond opposite sides and rearwardly of the post **15** on the plank **10** is a pair of laterally-spaced guide eyes **19** and **20**; and fixedly supported on said plank between the post and the eye **19** is a yarn tensioning device **21** which comprises a cylindric base component **22**, and a cap disk **23** capable of free rotative movement about an upward axial stud projection **24** of said base component. Also mounted on plank **10** is an electric heating device **25** comprising a small loop **26** of resistance wire whereof the terminals are secured in a block **27** of insulation at the top of a stand **28**, said device being so located relative to post **15** that its loop extends into close proximity to the cutting edge of blade **17** at the elevation of the groove **18** when said post is normally positioned as shown in Figs. 1, 2 and 3. When so positioned, the

post **15** is held against accidental rotation by its own weight, and through friction of its basal disk **15***a* with the table **10**, the pull on the yarn being light and its path being in a straight line between the curling edge **17***a* and the guide **20**.

To retract the blade **17** from the heating loop **26***a* and facilitate initial threading of the yarn Y to be curled in the apparatus, the post **15** is turned by hand to the position in which it is shown in Fig. 6. With this preparation, the yarn end Y taken from a source of supply (not shown) is drawn upward from beneath the plank **10**, then passed through the guide eye **19**, then beneath the disk **23** of tensioning device **21**, then around the groove **18** in post **15**, then through the guide eye **20**, then up to and through the traversing guide **14** of the winding mechanism and finally attached to the collecting spool S. Post **15** is thereafter turned back to the operative position in which it is shown in Fig. 3. All being now in readiness, electric current is turned on to heating device **25** and the winding machine set in motion. It is to be noted that due to the location of the guide eyes **19** and **20** relative to the post **15**, the yarn Y, under the pull of revolving spool S, is drawn across the curling edge of the blade **17** at a very sharp angle immediately after being somewhat softened or plasticized by the heat from the wire loop **26** of the heating device **25**, it being maintained all the while under a light but definite tension by the tensioning device **21**. In traversing the interval between the post **15** and the winding spool S, the yarn Y is afforded an opportunity to cool, with the result that the curls formed therein as at C in Figs. 1–3 incident to its passage about the edge of the blade **17**, become set against subsequent deformation. The extent to which the post **15** can be turned from the operative position of Fig. 3 to the retracted position of Fig. 6 and vice versa, is limited by engagement of a lateral stud projection **29** on its base disk **15***a* with stops **30** and **31** on the plank **10**.

In Fig. 7, the yarn Y enroute from the supply source is passed about a grooved roll **32** on a horizontal spindle **33** whereof the ends are rotatively supported in notched brackets **35** on the winding machine. Also affixed to spindle **33** is a plain faced roll **36** which is in frictional engagement with a drive wheel **37** on shaft **12** of the winding machine. From roll **32**, the yarn Y is directed by the guide **19** on the plank **10** to the curling device from whence it passes through the fixed guide **20** and the traversing guide **14** to the receiving spool S. Thus, in this instance, the yarn Y is drawn from the supply source at a definite rate and fed to the curling device by the action of the roll **36**, the required tension being maintained on the yarn through the pull induced by the rotating collecting spool S.

Having thus described our invention, we claim:

1. In apparatus for curling textile yarn, a curling means comprising a flat-sided post which is wedged shaped in cross section and a sharp-edged blade adjustably and removably secured to one of the flat sides of the post, said blade having its sharp edge projecting beyond the wedge point of the post to provide a curling edge; a pair of spaced yarn guides disposed behind the post to cause the yarn to pass at an acute angle about the curling edge; and a heating means positioned to heat the yarn just before its passage about the curling edge.

2. Yarn curling apparatus according to claim 1, wherein the post is provided in the flat side opposite to that occupied by the blade with a transverse groove for traverse by the yarn after it has passed about the curling edge.

3. Yarn curling apparatus according to claim 1, wherein the heating means is in the form of a loop of electrically-heated resistance wire positioned closely adjacent the blade of the curling means slightly rearward of the

curling edge as considered with respect to the direction of travel of the yarn.

4. Yarn curling apparatus according to claim 1, wherein the heating means is in the form of a loop of electrically-heated resistance wire positioned closely adjacent the blade of the curling means slightly rearward of the curling edge as considered with respect to the direction of travel of the yarn; and wherein the post is radial to and rigid with a basal disk having a pendent axial stud rotatively engaged in the support, whereby the post can

be turned through a partial rotation for retraction of the curling blade away from the heating loop to facilitate threading of the yarn in the apparatus.

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