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2,854,729

CRIMPING APPARATUS

Filed April 21, 1955

Fig. 3

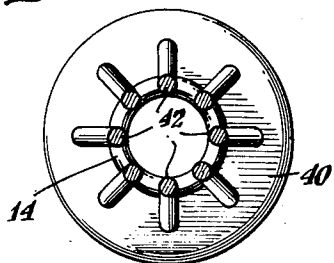


Fig. 2

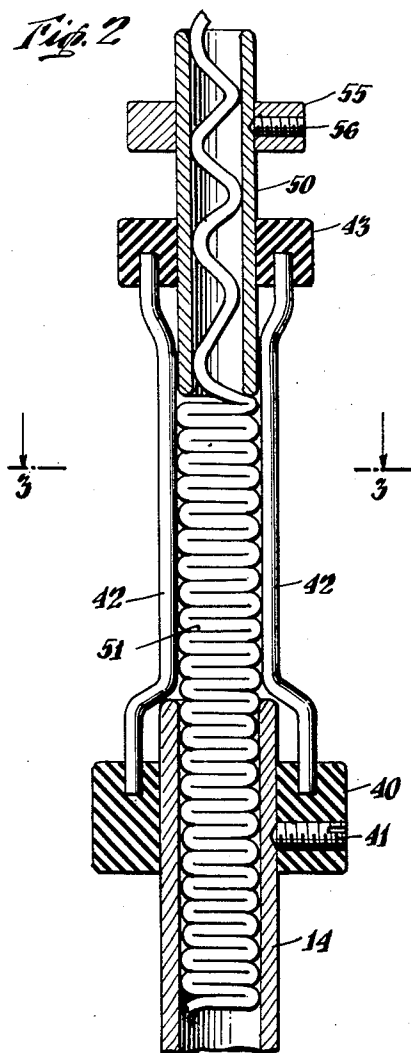
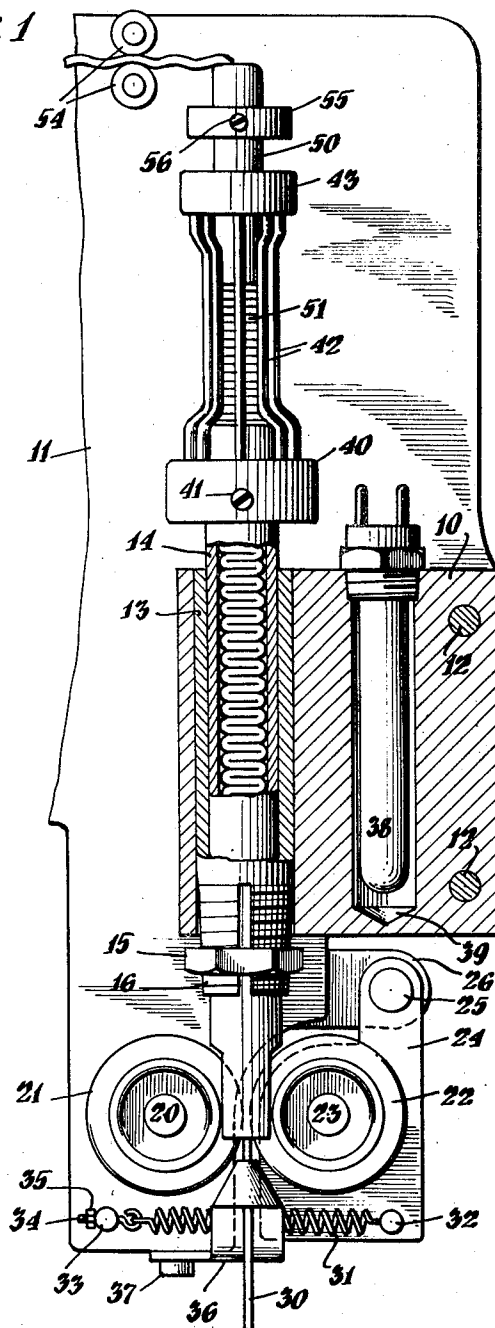


Fig. 1



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CRIMPING APPARATUS

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2 Claims. (Cl. 28—1)

This invention relates to apparatus for crimping continuous filament yarn or tow and has for an object to provide an apparatus of the above type having novel and improved characteristics.

Another object is to provide a stuffer crimper having novel and improved means for cooling the crimped yarn prior to discharge.

Another object is to provide a stuffer crimper so constructed as to provide access to the cooling chamber so that stray loops of yarn can be removed with a minimum of breakage.

Another object is to provide a stuffer crimper having heating and cooling chambers and having novel and improved means to minimize heat transfer therebetween.

Various other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

The invention will be better understood by referring to the following description, taken in connection with the accompanying drawing in which a specific embodiment thereof has been set forth for purposes of illustration.

In the drawing:

Fig. 1 is a side elevation of a stuffer crimper embodying the present invention with parts shown in section for clarity.

Fig. 2 is an enlarged sectional view of the cooling chamber; and

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2.

Referring to the drawing more in detail the stuffer crimper is shown as having a crimping chamber block 10 attached to a supporting plate 11 by screws 12. The block 10 is formed with a vertical bore in which a sleeve 13 is fixed by a press fit. A tube 14 fits loosely in sleeve 13 and is adjustably secured by a clamping nut 15 threaded onto the tapered split end 16 of the sleeve 13.

The plate 11 carries a bearing in which is journaled a shaft 20 carrying a feed roll 21. A second feed roll 22 is carried on a shaft 23 journaled in a bearing in an arm 24 pivotally attached as by a pin 25 to a bracket 26 which is attached to or carried by the plate 11. The shaft 20 is driven by a source of power, such as a motor, not shown. The shaft 23 is driven in unison therewith by meshing gears carried by their respective shafts 20 and 23.

The feed rolls 21 and 22 are held in pressure engagement with the yarn 30 which is to be fed thereby by means of a spring 31 attached at one end to a post 32 on the arm 24, and at the other end to a post 33 on the plate 11. Adjustment is provided by a threaded pin 34 and nut 35.

The yarn 30 is guided to the bite of feed rolls 21 and 22 by a fixed guide 36 which is attached by a screw 37 to the plate 11.

The lower end of the tube 14 is slotted to receive the rolls 21 and 22 and extends below the bite of the rolls to form therewith a substantially closed crimping chamber into which the yarn 30 is fed for crimping.

Heat is supplied to the crimping chamber within the

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tube 14 by suitable means such as a Calrod 38 disposed in a bore 39 in the block 10 and extending parallel to the crimping chamber. The Calrod or the like includes an electrical resistance which is energized from a suitable source of power not shown.

A collar 40 of heat insulating material is attached to the tube 14 near the top thereof by means of a set screw 41. The collar 40 carries a set of peripherally spaced wires 42 which are bent inwardly over the top of the tube 14 to form a confined channel which in effect constitutes an extension of the bore of the tube 14. The wires 42 are bent outwardly at their top ends and secured to an insulating collar 43, which is similar to the collar 40, so as to form a rigid unit. A plug 50 extends through a bore in the collar 43 and extends into the channel formed by the straight portion of the wires 42 to rest upon the mass of crimped yarn 51 therein.

The crimped yarn 51 is withdrawn through the bore of the plug 50 by suitable means shown as take-up rolls 54. A collar 55 is attached to the plug 50 by means of the set screw 56. This collar 55 serves as an adjustable weight for the plug 50 and also provides a shoulder for actuating an automatic control means for the feed of the yarn through the crimping chamber.

It is to be understood that the take-up rolls 54 are operated at a substantially constant rate bearing predetermined relationship to the rate of feed by the feed rolls 21 and 22, which relationship may be adjusted in response to variations in position of the plug 50 so as to maintain the plug at a substantially constant level within the cooling chamber formed by the wires 42.

In operation the feed rolls 21 and 22 feed the yarn 30 into the crimping chamber against pressure exerted by the mass of crimped yarn in said chamber. The mass of crimped yarn is advanced along the crimping chamber within the tube 14 where it is maintained at a predetermined temperature by means of the heating unit 38 and is then advanced from the end of the tube 14 along the channel formed by the wires 42 which constitute a cooling chamber. The crimped yarn is withdrawn from the top of the cooling chamber through the plug 50 by the take-up rolls 54 as above mentioned.

As the crimped yarn is forced upwardly through the sleeve 14 it is maintained under a temperature and pressure suited to facilitate setting of the crimp. Then while still held under compacting pressure the crimped yarn is forced upwardly through the cooling chamber where it is cooled to a temperature such that the crimp is permanently set and is retained after the yarn is withdrawn from the chamber and wound into packages. The length of the cooling chamber is so selected that the crimp is completely set in the yarn by the time the yarn reaches the top of this chamber.

It is to be noted that the open structure of the cooling chamber permits heat and vapors to escape into the atmosphere and prevent condensation from forming which would tend to collect on the walls of a closed cooling chamber. Obviously forced circulation of air over the wires may be provided if desired in order to increase the rate of dissipation of the vapors into the atmosphere and also to increase the rate of cooling. The friction of the walls of the cooling chamber is reduced by the use of spaced wires as above described instead of a solid tube. Hence the length of the chamber may be increased as desired without increasing the back pressure on the crimped yarn in the crimping chamber.

While a particular form of open cooling chamber has been shown, it is to be understood that this form may be modified. For example the cooling chamber may consist of a tube such as an extension of the tube 14 with parallel axial slits disposed around the periphery thereof to provide spaced cooling openings. Other changes and

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adaptations may be made as will be readily apparent to a person skilled in the art.

What is claimed is:

1. Apparatus for crimping yarn comprising a housing having a passage extending therethrough to form a crimping chamber, a pair of feed rolls disposed to feed said yarn into one end of said passage against the mass of crimped yarn held compacted therein, a plurality of longitudinal members extending upwardly above said housing and peripherally spaced to provide openings therebetween and thereby to define a cooling passage which is a continuation of said first passage, said longitudinal members being spaced to expose the yarn in said cooling passage to the atmosphere, and take-up means to withdraw the crimped yarn from said cooling passage after said yarn has passed along said crimping chamber and through said cooling passage.

2. Apparatus for crimping yarn comprising a housing having a passage extending therethrough to form a crimping chamber, a pair of feed rolls disposed to feed said yarn into one end of said passage against the mass

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of crimped yarn held compacted therein, a plurality of wires extending upwardly above said housing and peripherally spaced to provide openings therebetween and thereby to define a cooling passage which is a continuation of said first passage, said wires being spaced to expose the yarn in said cooling passage to the atmosphere, and take-up means withdrawing the crimped yarn from said cooling passage after said yarn has passed along said crimping chamber and through said cooling passage.

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