

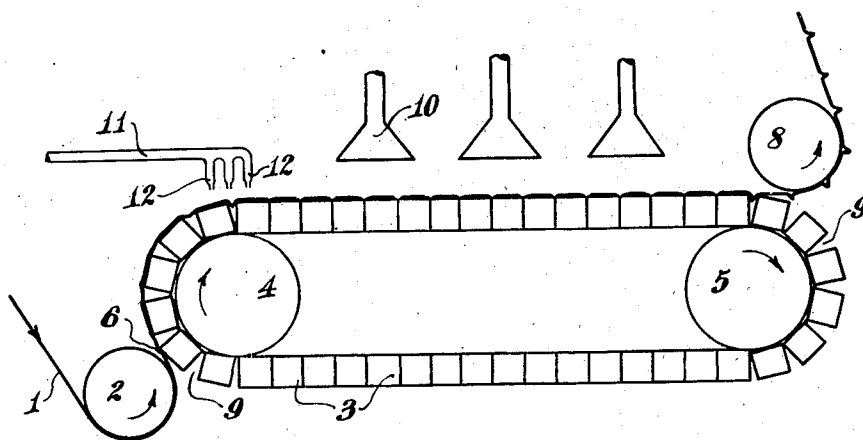
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H. P. COBB

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CRIMPING THREADS, FILAMENTS, AND THE LIKE

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Inventor
Henry Patrick Cobb
by his attorneys
Howson and Howson

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CRIMPING THREADS, FILAMENTS, AND THE LIKE

Henry Patrick Cobb, Harrow Weald, England, assignor to Courtaulds Limited, London, England, a British company

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This invention relates to the crimping of threads, filaments, fibres, yarns and the like hereinafter referred to as threads.

Proposals have already been made for the crimping of threads by mechanical means, as for example, intermeshing grooved rollers. Another arrangement which has already been proposed comprises in combination a delivery roller and a reel provided with a continuous surface of flexible material such as rubber which is moving at a linear speed less than that of the delivery roller.

According to the present invention the method of crimping thread comprises delivering the thread on to the outer surface of an endless moving conveyor at a point where the linear speed of the outer surface is faster than that of the inner surface and is substantially the same as the speed of delivery of the thread, allowing the thread to be carried along by the said conveyor until the speed of the outer surface has been reduced to that of the inner surface, fixing the crimp so formed in the thread and removing the crimped thread from the said conveyor.

The endless moving conveyor may comprise a flexible belt, for example of rubber, balata or leather, of substantial thickness so that there will be an appreciable difference between the linear speeds of the outer and inner surfaces while the belt is passing round drums or rollers. The thread is delivered on to the outer surface of the said belt at a point where it is passing round a drum or roller, and a crimp is formed in the thread by the slackening speed of the outer surface of the belt as it leaves the drum or roller.

The conveyor is provided at its outer surface with transverse cuts or the like openings, which are forced open as it passes round drums or rollers but close up again as it passes between the drums or rollers. For example, if the conveyor is a belt of rubber, balata or leather, or other flexible material, cuts are made in the outer surface thereof at suitable intervals. Alternatively the conveyor may be made of a rigid material in sections suitably jointed or hinged together. The rigid material may be wood, metal or artificial resin, and the sections transverse slats or rods presenting a relatively unbroken outer surface while passing between the rollers, but presenting V-shaped openings between adjacent slats while the conveyor is passing round the rollers. In this embodiment the thread is delivered on to the said conveyor at a point where it passes round one of the drums or rollers, and the cuts or openings are forced open and

the crimp is formed by the walls of the cuts or openings nipping the thread as they close when the conveyor leaves the drum or roller. The resulting crimped thread is removed from the conveyor at a point where it passes round another roller and the cuts or openings are forced open again.

The degree of crimp may be controlled by varying the thickness of the flexible belt or by varying the number of cuts or the like per unit length of the conveyor, or by varying the relative speeds of the conveyor and the thread supplied thereto. When the cuts or openings extend right through the conveyor, for example in the case of a conveyor formed of rods or slats, the thread may be forced into the open cuts or the like, by means of jets of air or liquid for example coagulating liquid.

The rollers round which the conveyor passes may be drums, wheels, pulleys or the like and one or both may be driven.

The thread may be partially or completely coagulated and may be in the wet or dry condition when it is supplied to the conveyor. It may consist, for example, of partially or wholly regenerated cellulose prepared by the extrusion of viscose into a coagulant. The thread may, if desired, be submitted to further treatment, for example, washing, drying or additional coagulation while on the conveyor, or after leaving the conveyor.

Care must be taken to fix the crimp before appreciable tension is applied to the crimped thread. This may be done in many ways, for example, if the thread is partially coagulated, the crimp may be fixed with a coagulant to complete coagulation. If the thread is thermoplastic it may be crimped under conditions in which it is plastic and thereupon cooled to fix the crimp. If desired while the fixing of the crimp is taking place the crimp may be held in position by pressure exerted by a mechanical device such as rollers or a travelling belt.

The accompanying diagrammatic drawing illustrates an arrangement of apparatus suitable for carrying the invention into effect although the invention is not restricted to the use of the arrangement illustrated. The figure is a side elevation.

As shown in this figure, the thread 1 is led over the guide roller 2 on to a conveyor comprising a number of parallel rods 3. These rods are loosely hinged together, so that they can pass round the rollers 4 and 5. While passing between the rollers the rods present a relatively

unbroken surface, but while passing round the rollers V-shaped openings 9 are formed between each pair of rods. The thread 1 is led on to the conveyor at the point 6 where the conveyor is passing round the roller 4 and the V-shaped openings 9 are formed between adjacent rods. As the rods pass round the roller 4 and leave it, streams of air or liquid from jets 12 connected with a supply tube 11 force the thread into the V-shaped openings 9 which close up nipping between them the thread, so that crimps are formed. The crimped thread is removed from the conveyor 3 by drawing it off round the roller 8 at a point where the conveyor 3 passes round the roller 5 and V-shaped openings 9 are again formed between adjacent rods.

Any desired liquid treatment such as with coagulant, washing liquid or bleaching liquid, may be applied to the thread while passing along the conveyor, by means for example, of spraying devices 10 illustrated.

What I claim is:

1. A method of crimping thread which comprises delivering the thread on to the outer surface of an endless moving conveyor passing round drums or rollers and provided with transverse slots which are closed as the conveyor passes between the said drums or rollers but are forced open as it passes round them, at a point where the said conveyor passes round one of the said drums or rollers, fixing the crimp formed in the thread by the walls of the slots nipping the thread as they close together as the conveyor leaves the said drum or roller and thereafter removing the crimped thread from the conveyor at a point where it passes round another drum or roller.

2. A method of crimping thread which comprises delivering the thread on to the outer surface of a thick flexible belt passing round drums or rollers provided on its outer surface with transverse cuts which are closed as the belt passes between the said drums or rollers but are forced open as it passes round them, at a point where the said belt passes round one of the said drums or rollers, fixing the crimp formed in the thread by the walls of the cuts nipping the thread as they close together as the belt leaves the said drum or roller and thereafter removing the crimped thread from the belt at a point where it passes round another drum or roller.

3. A method of crimping thread which comprises delivering the thread on to the outer surface of an endless moving conveyor consisting of transverse slats hinged together passing round drums or rollers, the said slats being close together as the conveyor passes between the said drums or rollers but forced apart as it passes

round them, at a point where the said conveyor passes round one of the said drums or rollers, fixing the crimp formed in the thread by the walls of the slats nipping the thread as they close together as the conveyor leaves the said drum or roller and thereafter removing the crimped thread from the conveyor at a point where it passes round another drum or roller.

4. A method of crimping thread which comprises delivering the thread on to the outer surface of an endless moving conveyor passing round drums or rollers and provided with transverse slots which are closed as the conveyor passes between the said drums or rollers but are forced open as it passes round them, at a point where the said conveyor passes round one of the said drums or rollers, forcing the thread into the open slots by means of a jet of liquid, fixing the crimp formed in the thread by the walls of the slots nipping the thread as they close together as the conveyor leaves the said drum or roller and thereafter removing the crimped thread from the conveyor at a point where it passes round another drum or roller.

5. A method of crimping thread which comprises delivering the thread on to the outer surface of an endless moving conveyor passing round drums or rollers and provided with transverse slots which are closed as the conveyor passes between the said drums or rollers but are forced open as it passes round them, at a point where the said conveyor passes round one of the said drums or rollers, forcing the thread into the open slots by means of a jet of air, fixing the crimp formed in the thread by the walls of the slots nipping the thread as they close together as the conveyor leaves the said drum or roller and thereafter removing the crimped thread from the conveyor at a point where it passes round another drum or roller.

6. A method of crimping thread which comprises delivering the thread in a partially coagulated condition on to the outer surface of an endless moving conveyor passing round drums or rollers and provided with transverse slots which are closed as the conveyor passes between the said drums or rollers but are forced open as it passes round them, at a point where the said conveyor passes round one of the said drums or rollers, fixing the crimp formed in the thread by the walls of the slots nipping the thread as they close together as the conveyor leaves the said drum or roller by completing coagulation of the crimped thread and thereafter removing it from the conveyor at a point where it passes round another drum or roller.

HENRY PATRICK COBB.