July 14, 1970 I. H. SWALLOW 3,520,483

YARN WINDUP MEANS

Filed Nov. 20, 1967

Fig. 1.

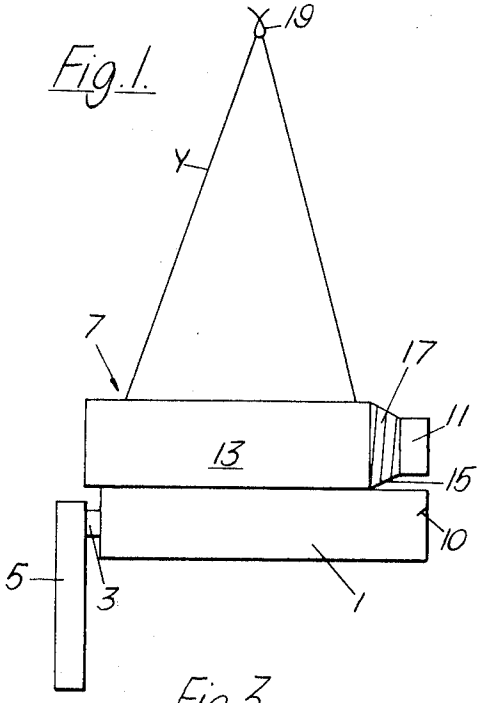


Fig. 2.

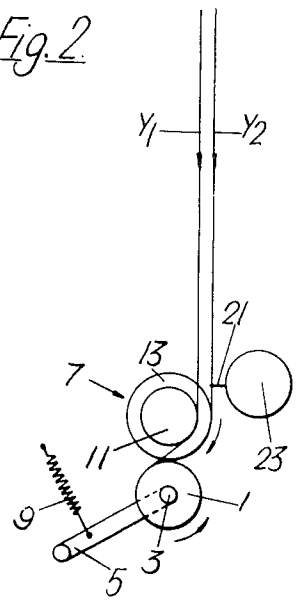


Fig. 3.

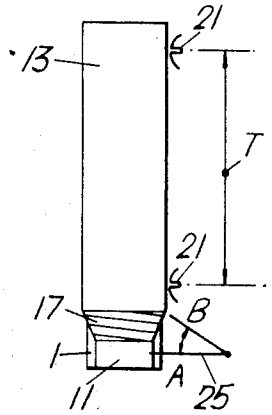
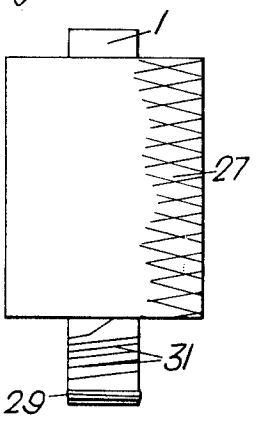


Fig. 4



Inventor

IAN HENRY SWALLOW

By Cushman, Darby & Cushman

Attorneys

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YARN WINDUP MEANS

Ian Henry Swallow, Goytre, England, assignor to Imperial Chemical Industries Limited, London, England, a corporation of Great Britain

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Int. Cl. B65h 54/02, 54/42
U.S. Cl. 242—18 2 Claims

ABSTRACT OF THE DISCLOSURE

In "print-roll" winding, the package drive roll ("print roll") is stepped and winding is initiated from the portion of reduced diameter, the transfer tail being wound whilst the thread-line is directed along a screw-thread cut in an inclined portion to the portion of full diameter.

The invention concerns improvements in or relating to yarn windup means and is particularly concerned with means for initiating winding on surface-driven yarn holders.

BACKGROUND OF THE INVENTION

It is a common practice in the synthetic fibre-producing art to windup yarn on tubular yarn holders which are mounted on "chucks" and rotatably driven by a drive roll.

Difficulty is sometimes experienced in initiating winding on the yarn holder owing to the predilection of the yarn for adhering to the high-friction, e.g. glossy, surface of the drive roll rather than to the surface of the yarn holder which may be, for instance, of a treated cardboard nature.

This is particularly the case when winding is arranged to take place by traversing the yarn, by a reciprocating traverse guide, firstly on to an axial length of the drive roll surface, from which it is then "printed" on to the yarn holder. Such "print roll" technique of winding has advantages over winding directly on to the yarn holder (and package thereon) from the traverse guide, especially in regard to the formation of regular and stable yarn packages at high winding and traverse speeds.

OBJECT OF THE INVENTION

The object of the invention is, therefore, to provide apparatus for the positive initiation of winding on a yarn holder driven by surface contact with a drive roll; and, subsidiarily, to provide a means for winding a transfer tail at one end of the yarn holder clear of the yarn package thereon.

SUMMARY OF THE INVENTION

According to the invention, yarn windup means, comprising a reciprocable traverse guide, a drive roll and an arbor, or "chuck," for bearing a tubular yarn holder adapted to be rotatably driven by peripheral contact between said drive roll and said yarn holder or yarn wound thereon, is characterised in that one end-portion of said drive roll is of reduced diameter, and said end-portion is connected with the main portion of full diameter by an intermediate frusto-conical portion.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Preferably, the intermediate frusto-conical portion is provided in its surface with a helical yarn-guiding groove, e.g. a screw-thread, extending from the end-portion of reduced diameter to the main portion of full diameter. Preferably, also, the surface of the end-portion, at least,

of the drive roll is a low friction, e.g. matt-chromed, surface.

The above-defined yarn windup means is adapted to initiate winding of yarn on the yarn holder by the use of the reduced diameter end-portion of the drive roll during the stringing-up operation, whereby, owing to the low friction of the surface of the end-portion and owing to its lower surface speed compared with that of the yarn holder (which is being driven peripherally at or close to the surface speed of the full diameter portion of the drive roll), the yarn is predisposed to wind around the yarn holder, rather than to lick around the drive roll.

Movable yarn guide means, such as a swivellable pin, may be positioned adjacent the end-portion of reduced diameter and between it and the field of traverse of the reciprocable traverse guide, in order that during stringing-up the yarn may be guided outside the normal field of traverse on to the end-portion of reduced diameter. From there, the yarn is directed on to the corresponding end-portion of the yarn holder in which, conveniently, a notch is provided by which the yarn may be engaged; and the end of yarn is then cut off and a bunch of coils wound.

Such a pin may then be swivelled, either manually or automatically, as by the action of a spring after release of the pin by latching means, to take up a position guiding the yarn axially from the end-portion into the helical groove of the intermediate portion, the yarn path tending to be moved in that axial direction so as to take up the midposition of the traverse stroke to which it will be constrained. Such axial movement of the yarn path provides for the winding of a transfer tail of spaced coils.

When the yarn has been discharged from the helical groove on to the portion of the drive roll of full diameter, the yarn path will be intercepted by the reciprocating traverse guide and the yarn then taken up automatically thereby for traversing across the main portion of the drive roll, whence it is "printed" on to the yarn holder to start the formation of the yarn package.

If it is not desired to cut a notch in the yarn holder itself, which yarn holder may be a standard type cardboard container for a cheese type package, it may be preferred to secure a waste sleeve over the end of the holder, said sleeve containing a yarn-engaging slot and serving to carry the first-wound bunch of coils. The waste sleeve may be removed from the yarn holder at the completion of winding.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described with reference to the accompanying diagrammatic drawings, in which:

FIG. 1 is a front elevational view of yarn windup means according to the invention,

FIG. 2 is a side elevational view of the windup means of FIG. 1,

FIG. 3 is a plan view indicating the normal traverse and the means for initiating winding, in relation to the drive roll of said windup means, and

FIG. 4 is a diagram of a wound yarn package according to the invention.

FIGS. 1 and 2 show diagrammatically a typical windup arrangement for, e.g., synthetic continuous filament yarns after drawing, modified according to the invention.

Yarn Y is wound on tubular yarn holder **1** which is mounted for rotation on freely-rotatable arbor **3** on the end of swing-arm **5**; and yarn holder **1** is urged into driving contact with positively-rotated drive roll **7** by means of spring **9**. A notch **10** is cut in one end of yarn holder **1** for catching the yarn initially.

Drive roll **7** has one end-portion **11** of reduced diameter and of a matt-chromed surface. The full diameter

portion **13** of the drive roll is of bright chromed surface. Between the two portions, there is a frusto-conical intermediate portion **15**, in the surface of which a screw-thread **17** is cut for guiding the yard whilst a transfer tail of spaced helical turns is wound on the container **1** (see FIG. 4).

The yarn Y is delivered by means (not shown) to a pretraverse fixed guide **19**; and, when winding has been initiated, the yarn is traversed axially of the yarn holder to form a yarn package thereon by means of traverse guide **21** reciprocated by traverse box **23** (FIG. 2).

In FIG. 2, Y_1 is used to indicate the yarn path during the initiation of winding, and Y_2 to indicate the yarn path during normal (traversing) winding.

The plan view depicted in FIG. 3 indicates diagrammatically the normal traverse stroke T, and also the two positions A and B of a swivelling pin **25** by which the yarn is directed to and from the end of yarn holder **1** during the initiation of winding.

In FIG. 4, a cheese-type yarn package **27** is shown wound on yarn holder **1**. Also shown is a bunch **29** wound whilst the yarn is being directed to wind on the end of the yarn holder by swivelling pin **25** in position A; and a transfer tail **31** of spaced helical turns wound whilst the yarn path progresses along the screw-thread **17**.

The apparatus of the invention is particularly suitable for use on a high-speed draw-winding machine for synthetic yarns of (e.g., polyamide and polyester fibres).

I claim:

1. In yarn windup means including a reciprocable traverse guide adapted to reciprocate across a field of traverse, a drive roll having a cylindrical main portion and a cylindrical end portion, and an arbor for bearing a tubular yarn holder adapted to be rotatably driven by peripheral contact between said drive roll and said yarn holder or yarn wound thereon, the improvement comprising said end-portion of said drive roll being of reduced diameter compared with the main portion of the roll, said end-portion being connected to said main portion by an intermediate frusto-conical portion and said field of traverse not extending beyond the ends of said main portion of the roll; and a movable yarn guide means positioned adjacent said end-portion of reduced diameter and between it and said field of traverse for engaging the yarn and guiding the same to a position to be wound on to said end-portion of reduced diameter, said yarn guide means being movable so as to disengage the yarn and permit the same to move to a position to be engaged by said traverse guide.

2. Yarn windup means according to claim **1** wherein said intermediate frusto-conical portion is provided with a helical yarn guiding groove in its surface.

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STANLEY N. GILREATH, Primary Examiner

U.S. Cl. X.R.

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