

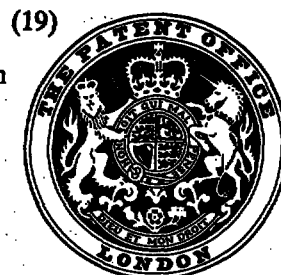
PATENT SPECIFICATION

(11)

1 579 654

1 579 654

- (21) Application No. 12404/77/ (22) Filed 24 Mar 1977/
(31) Convention Application No. 2616965 (32) Filed 17 Apr. 1976 in
(33) Fed. Rep of Germany (DE)
(44) Complete Specification Published 19 Nov. 1980
(51) INT. CL.³ B65H 67/04 54/86
(52) Index at Acceptance
D1J BA
D1F 7



(54) METHOD AND APPARATUS FOR RECEIVING A THREAD AND TRANSFERRING IT TO A BOBBIN AFTER A BOBBIN CHANGE

(71) We, SCHUBERT & SALZER
M A S C H I N E N F A B R I K
AKTIENGESELLSCHAFT, a Germany
Body Corporate, of Friedrich-Ebert-Strasse
84, 8070 Ingolstadt Germany, do hereby
declare the invention, for which we pray
that a patent may be granted to us, and the
method by which it is to be performed, to be
particularly described in and by the follow-
ing statement:-

This invention relates to a method of
receiving a thread and of delivering it to a
bobbin after a bobbin change, in which the
thread extends between a thread forwarding
device and a thread-holding device follow-
ing severance from the full bobbin.

It is known, for effecting a bobbin change
and for forming a thread reserve, to sever
the thread leading to the full bobbin, to feed
the remaining end of the thread which
continues to be supplied to a thread-holding
device, to seize, after the full bobbin has
been replaced by an empty bobbin, the
thread extending to the thread-holding de-
vice, and to bring this thread up to the
empty bobbin, and grip it between the end
of the empty bobbin and a part which lies
adjacent to, and rotates with, the empty
bobbin, whereupon the thread, extending
between thread-holding device and the
point at which the thread is gripped, is
severed a fixed distance away from the
empty bobbin. (British Specification 1 465
350). As, particularly in the case of thicker
threads, the thread-holding device cannot
draw off the thread in consequence of the
high degree of deflection at the gripper, the
thread accumulates in an uncontrolled man-
ner between the draw-off rollers and the
grripper. This may lead to difficulties in
winding up the thread, at least until the
excess thread length is taken up.

The present invention aims in general at
removing these disadvantages by ensuring
that the thread cannot accumulate, on the

occasion of a bobbin change, between the
draw-off rollers and gripper and will be
reliably wound up from the outset on the
new bobbin and in providing an apparatus
suitable for carrying out this method.

According to the invention there is pro-
vided a method of receiving a thread and
delivering it to a fresh bobbin after a bobbin
change, wherein the thread extends be-
tween a thread forwarding device and a
thread-holding device following severance
from the full bobbin comprising the steps of:
providing an auxiliary draw-off mechanism
between said thread forwarding device and
said thread-holding device; mechanically
drawing said thread from said thread for-
warding device by operation of said auxil-
iary draw-off mechanism to produce a draw-
ing zone between the thread forwarding
device and said auxiliary draw-off mechan-
ism; and picking up said thread in said
drawing zone and drawing out the thread
into the vicinity of a fresh bobbin for
transfer thereto.

Also according to the invention, and for
performing the method apparatus compris-
ing forwarding rollers for drawing the
thread from a thread delivery station and
feeding it to the thread-holding device, and
also means for picking up and guiding the
thread fed by the forwarding rollers to the
bobbin, characterised in that auxiliary draw-
off rollers for mechanically drawing the
thread from the forwarding rollers are
arranged between the forwarding rollers
and the thread-holding device.

The thread may be drawn out from the
said drawing zone into the vicinity of the
bobbin by means of a gripper which carries,
at its working end, two thread guides and is
movable, together with these guides, into
the working range of a thread catcher
device.

The thread guide lying remote from the
bobbin centre preferably passes over into a

3 MAR 1981

recess which extends, in respect of its transfer position, obliquely towards the working end and towards the drawing zone, a stationary cutter being arranged at the end of the recess. Conveniently, the thread guide lying closer to the bobbin centre is constituted as a U-shaped recess which is open at its end remote from the zone of positive thread conveyance. It will be found satisfactory if the thread catcher device is constructed as a thread catcher lug, which faces the direction of rotation of the bobbin and forms part of a bobbin plate of which the diameter is greater than that of the bobbin and if the thread guide lying remote from the bobbin centre extends, in the position in which it lies in the working range of the thread catcher lug, further towards the bobbin axis than the thread guide lying closer to the bobbin centre. It has been found to be particularly advantageous if the bobbin plate has a recess which partially receives the bobbin and an outer periphery which annularly surmounts the end of the bobbin and descends conically towards the bobbin centre. By virtue of the positive way in which the thread is drawn off, the thread is always reliably drawn off, so that the thread does not accumulate in front of the thread guide device and thus later must not be reduced when the thread is released by the guide device. This precludes irregularities in winding the yarn and disturbances caused thereby. By reason of the provision of a positive thread draw-off, there is no need for a controlling cutting device, as the thread is positively guided, owing to the cooperation between thread draw-off and thread catcher lug, into the vicinity of a stationary cutting edge. Accordingly, the thread is always cut at the same stage in the working cycle.

The invention is hereafter described in greater detail by reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a spinning station with the apparatus, including a simple form of thread guiding device, according to the invention, and also the parts required for understanding the invention,

Figure 2 is a perspective view of an improved form of thread guiding device; and

Figure 3 is a longitudinal cross-section of part of the bobbin and of the bobbin flange.

The invention can be used on various textile machines, for example on a winding frame or on an open-end spinning machine. As the problem of accumulations of material between draw-off device and gripper is particularly acute in the case of open-end spinning machines, in consequence of the uninterrupted production of yarn, the invention will be further explained with refer-

ence to an open-end spinning machine.

In the case of the open-end spinning machine shown in Figure 1, the thread 5 produced in a schematically represented thread supply station 1, is continually drawn off from a draw-off device consisting of the forwarding rollers 10, 11 and is wound on to a bobbin 2 which, in the working position illustrated, rotates on a winding roller 20 through frictional contact. In the embodiment illustrated, the bobbin 2 is resiliently clamped between two bobbin holders 22, 23 pivotable about a pin 21. Positioned in front of the winding roller 20 is a thread guide 24 which is fixed on a bar 25, which is moved back and forth.

Between the forwarding rollers 10, 11 and the winding roller 20 is a suction duct 3 with a thread holding device 30, which is located to one side of the path of travel 50 of the thread. The thread holding device is formed by an air suction nozzle 30 and it can be closed off by a cover 31. Also, an arcuate thread tension compensating member 32 is arranged on the suction duct 3. Auxiliary draw-off rollers 10, 12 are arranged at a suitable point in the thread path between the forwarding rollers 10, 11 and the thread-holding device 30. In order to enable the thread 5 to be satisfactorily pick up between the forwarding rollers 10, 11 and the auxiliary draw-off rollers 10, 12, thread guides 13 and 14 are provided so as to deflect the thread between the forwarding rollers 10, 11 and the bobbin 2 in such a manner that the auxiliary draw-off rollers 10, 12 may be arranged beside the forwarding rollers 10, 11. As can be seen from the drawings the forwarding rollers 10, 11 and the auxiliary draw-off rollers 10, 12 comprise a common driven draw-off roller 10 but individual presser rollers 11, 12.

Owing to the forwarding rollers 10, 11 and the auxiliary draw-off rollers 10, 12 being positioned side by side, when the thread 5 is passed around guides 13 and 14 and is held in the thread holding device 30 there is obtained a section 51 of thread which extends substantially transversely of the path 50 of thread travel. This is particularly satisfactory for enabling the thread 5 to be seized and pulled out into the vicinity of a thread catcher device positioned on the edge of the bobbin. The thread catcher device may be constructed in various ways, and arranged on the bobbin 2 or on the bobbin flange 6. As shown in Figure 1, which illustrates a preferred embodiment, a thread catcher lug 60 is arranged on the periphery of the bobbin flange 6 and opens in the same direction as the direction of rotation 26 of the bobbin 2.

A device 4 is provided for guiding the thread 5. This device 4 (Figures 1 and 2) comprises a handle 40, which carries a main

body 41. This main body 41 of the device is of substantially parallel piped shape and carries, on each of its opposed side faces, a respective plate 42, 43 with respective thread guides 44, 45. These thread guides lie on the ends, lying remote from the handle 40, of plates 42, 43 on the longitudinal side of plates 42 and 43 positioned on the same side of the main body 41 of the gripper. On its longitudinal side, lying remote from the thread guide 45, plate 43 has a further recess 46 at its end remote from the handle 40.

The apparatus whose construction has been described above, functions in the following manner:

During a normal spinning process, the thread 5 is drawn from the thread delivery station 1 (Figure 1) by the forwarding rollers 10, 11 and wound on the bobbin 2. When the bobbin 2 is full, with the result that the full bobbin has to be replaced by an empty bobbin 2, the full bobbin (not shown) is lifted from the bobbin roller 20 by raising the bobbin holder 22, and the thread 5 extending from the forwarding rollers 10, 11 to the bobbin is severed. The beginning of the thread 5, which continues to be pulled away from the thread delivery station 1, is introduced usually by hand into the thread holding device 30, constructed as an air suction nozzle, and is continuously drawn away by this thread holder 30. The path of the thread travel is now designated as 52. The full bobbin is now replaced by an empty bobbin 2.

By means of a recess 46 on the device 4, the thread 5, whose path of travel is designed as 52, is picked up and guided to a point below the thread guide 14. The thread 5, which abuts a nip at the end face of auxiliary draw-off roller 12 now automatically finds its way into the nip of the thread draw-off rollers 10, 12 and is then positively drawn off from thread forwarding rollers 10, 11. The path of the thread in this position is designated 51. Thus there is formed a zone 15 in which the thread is drawn but substantially without stretching.

The operative then guides by means of the thread guides 44 and 45 of the thread guiding device 4, the thread section 51 extending in the zone 15, to form a loop 53, to the thread catcher lug 60 on the bobbin flange 6. During this time the thread 5 is pulled through the thread guides 44 and 45 by the auxiliary draw-off rollers 10, 12. In this way it is ensured that the thread is continuously tensioned in the zone 15, and that accumulations of thread cannot take place. The thread catcher lug 60 seizes the tensioned thread 5, and pulls it into the nip between the bobbin 2 and the winding roller 20. The section of thread extending from the thread catcher lug 60 to the thread guide 14 is severed, while the thread 5 extending

from the draw-off rollers 10, 11 to the bobbin 2 is wound up on the latter. As the thread is only gradually moved into the vicinity of the reciprocating thread guide 24 due to the thread tension, a number of reserve turns are formed at the end of the bobbin 2.

In this way it is possible, even in the case of coarser yarn counts, to prevent an accumulation of thread between forwarding rollers 10, 11 and guide device 4, with the drawbacks already referred to.

The guide device 4 may be constructed in various ways, for example, in the manner of the apparatus illustrated in Figure 7 of British Patent Application 40377/76 in (Serial No. 1566268) which the cutter device is manually controllable.

However, in consequence of the positive form of thread conveyance, the thread 5 is always subject to a draw-off tension so that any cutter device does not have to be controlled. Therefore, as shown in Figure 2 the thread guide 45 lying remote from the bobbin centre 27 merges into a recess 47 which extends obliquely in the direction of the working end, lying remote from the handle 40, and also of the zone 15, a stationary cutter 48 being arranged at the end of recess 47.

When the thread 5 is being guided into the vicinity of the thread catcher device 60 by the device 4 the thread 5 lies in the thread guides 44 and 45; that is to say it does not lie in the vicinity of the stationary cutter 48. Only when the thread catcher device has seized the thread 5 and pulled it into the nip between the winding roller 20 and the bobbin 2, does the thread 5 arrive in the vicinity of the cutter 48. As, in consequence of the draw-off tension to which the thread is subject in the zone 15 for the thread, the latter is firmly pulled against cutter 48, the cutter 48 severs the thread 5. As the instant in which this severance occurs depends on the position of the thread-catcher device and, hence, on the position of the thread 5, it is ensured that the thread end thus formed will always be of a constant length.

In order to enable the number of thread reserve turns to be controlled, the thread guide 44 which lies closer to the centre 27 of the bobbin is constituted as a U-shaped recess which is open at its end. In this way a lug 49 is also formed, between the thread guide 44 and the plate end. Apart from placing the thread 5 in front of the thread catcher device, the thread guide 44 acting by means of its lug 49 ensures that the thread 5 - which runs from the draw-off rollers 10, 11 past the outer face of plate 42, through the thread guide 44 on the inner face of lug 49, and thence to the bobbin 2 - cannot pass to the centre 27 of the bobbin in the vicinity of the reciprocating thread guide 24 for as

long as the guide device 4 is still in the transfer position. Accordingly, the period of time during which the operative leaves the guide device 4 in this position, determines the number of reserve turns formed.

Also, the thread catcher device may be constructed in various ways, for example as a brush. However, in the embodiment illustrated and described, the thread catcher device is arranged as a thread catcher lug 60 defining a slot which opens in the same direction as the direction of rotation 26 of the bobbin and forms part of the bobbin flange 6. The thread 5 can be transferred to the thread catcher lug 60 in a particularly satisfactory manner if the thread guide 45 lying remote from the centre 27 of the bobbin extends, in the position where it lies within working range of the thread catcher lug 60, extends further towards the bobbin axis 28 than the thread guide 44 lying closer to the bobbin centre 27. In order to prevent reserve turns falling from the bobbin 2 after a full bobbin has been removed, it has been found to be particularly satisfactory if the bobbin flange 6 is so constructed that it has a recess 61, which partially receives the bobbin 2 and may be circular or annular, and if the bobbin flange 6 has an outer surface 62 which annularly surmounts the end of bobbin 2 and descends conically towards the bobbin centre 27 (Figure 3). During the formation of the reserve turns, the latter are guided, by the conical outer surface 62 of the bobbin plate 6, in the direction of the bobbin 2, so that there is a certain distance between these turns and the edge of the bobbin when the latter has formed a complete package of thread. By virtue of the thread tension formed in the zone 15, the thread reserve turns assume from the outset a position in which the necessary safety distance is maintained between them and the bobbin edge.

As the foregoing description shows, the present invention enables, on the occasion of a bobbin change, the thread 5 to be satisfactorily wound, from the outset, on to the new bobbin 2. The subject matter of the invention is susceptible of numerous modifications. Also, the thread guide device 4 does not necessarily have to be actuated by hand, but may form part of an automatic device, one of which may be provided for each spinning station or which may be commonly available for a number of spinning stations. In the latter case the thread guide device may for example be arranged on a carriage or slide which can travel along a machine which comprises a number of spinning stations, this carriage or slide travelling, in some suitable way, to the working station where it is to be used.

WHAT WE CLAIM IS:-

1. A method of receiving a thread and

delivering it to a fresh bobbin after a bobbin change, wherein the thread extends between a thread forwarding device and a thread-holding device following severance from the full bobbin comprising the steps of: providing an auxiliary draw-off mechanism between said thread forwarding device and said thread-holding device; mechanically drawing said thread from said yarn forwarding device by operation of said auxiliary draw-off mechanism to produce a drawing zone between the yarn forwarding device and said auxiliary draw-off mechanism; and picking up said thread in said drawing zone and drawing out the thread into the vicinity of a fresh bobbin for transfer thereto.

2. Apparatus for performing the method claimed in claim 1, comprising forwarding rollers for drawing the thread from a thread delivery station and feeding it to the thread-holding device, and also means for picking up and guiding the thread fed by the forwarding rollers to the bobbin, characterised in that auxiliary draw-off rollers for mechanically drawing the thread from the forwarding rollers are arranged between the forwarding rollers and the thread holding device.

3. Apparatus according to claim 2, characterised in that the auxiliary draw-off rollers are arranged to one side of the forwarding rollers and thread guides are provided between the thread forwarding rollers and the auxiliary thread draw-off rollers for guiding thread from the forwarding rollers to the auxiliary thread draw-off rollers.

4. Apparatus according to claim 3, characterised in that the draw-off roller and the auxiliary draw-off rollers have a common driven roller and individual presser rollers bearing against the driven roller.

5. Apparatus for performing the method claimed in claim 2 having a thread catcher device in the vicinity of a bobbin edge, in which said means for picking up and guiding the thread bears, at its working end, two thread guides and is movable, together with these thread guides, into the working range of the thread catcher device, characterised in that the thread guide lying remote from the bobbin centre merges into a recess which extends obliquely in the direction of the working end, lying remote from a handle of the thread catcher device and of the drawing zone, a cutter being arranged at the end of the recess.

6. Apparatus according to claim 5, characterised in that the thread guide nearest the bobbin centre is constructed as a U-shaped recess which is open at its end lying remote from the zone between the yarn forwarding rollers and the auxiliary draw-off rollers.

7. Apparatus according to claim 5 or 6, in which the thread catcher device is consti-

long as the guide device 4 is still in the transfer position. Accordingly, the period of time during which the operative leaves the guide device 4 in this position, determines the number of reserve turns formed.

Also, the thread catcher device may be constructed in various ways, for example as a brush. However, in the embodiment illustrated and described, the thread catcher device is arranged as a thread catcher lug 60 defining a slot which opens in the same direction as the direction of rotation 26 of the bobbin and forms part of the bobbin flange 6. The thread 5 can be transferred to the thread catcher lug 60 in a particularly satisfactory manner if the thread guide 45 lying remote from the centre 27 of the bobbin extends, in the position where it lies within working range of the thread catcher lug 60, extends further towards the bobbin axis 28 than the thread guide 44 lying closer to the bobbin centre 27. In order to prevent reserve turns falling from the bobbin 2 after a full bobbin has been removed, it has been found to be particularly satisfactory if the bobbin flange 6 is so constructed that it has a recess 61, which partially receives the bobbin 2 and may be circular or annular, and if the bobbin flange 6 has an outer surface 62 which annularly surmounts the end of bobbin 2 and descends conically towards the bobbin centre 27 (Figure 3). During the formation of the reserve turns, the latter are guided, by the conical outer surface 62 of the bobbin plate 6, in the direction of the bobbin 2, so that there is a certain distance between these turns and the edge of the bobbin when the latter has formed a complete package of thread. By virtue of the thread tension formed in the zone 15, the thread reserve turns assume from the outset a position in which the necessary safety distance is maintained between them and the bobbin edge.

As the foregoing description shows, the present invention enables, on the occasion of a bobbin change, the thread 5 to be satisfactorily wound, from the outset, on to the new bobbin 2. The subject matter of the invention is susceptible of numerous modifications. Also, the thread guide device 4 does not necessarily have to be actuated by hand, but may form part of an automatic device, one of which may be provided for each spinning station or which may be commonly available for a number of spinning stations. In the latter case the thread guide device may for example be arranged on a carriage or slide which can travel along a machine which comprises a number of spinning stations, this carriage or slide travelling, in some suitable way, to the working station where it is to be used.

WHAT WE CLAIM IS:-

1. A method of receiving a thread and

delivering it to a fresh bobbin after a bobbin change, wherein the thread extends between a thread forwarding device and a thread-holding device following severance from the full bobbin comprising the steps of: providing an auxiliary draw-off mechanism between said thread forwarding device and said thread-holding device; mechanically drawing said thread from said yarn forwarding device by operation of said auxiliary draw-off mechanism to produce a drawing zone between the yarn forwarding device and said auxiliary draw-off mechanism; and picking up said thread in said drawing zone and drawing out the thread into the vicinity of a fresh bobbin for transfer thereto.

2. Apparatus for performing the method claimed in claim 1, comprising forwarding rollers for drawing the thread from a thread delivery station and feeding it to the thread-holding device, and also means for picking up and guiding the thread fed by the forwarding rollers to the bobbin, characterised in that auxiliary draw-off rollers for mechanically drawing the thread from the forwarding rollers are arranged between the forwarding rollers and the thread holding device.

3. Apparatus according to claim 2, characterised in that the auxiliary draw-off rollers are arranged to one side of the forwarding rollers and thread guides are provided between the thread forwarding rollers and the auxiliary thread draw-off rollers for guiding thread from the forwarding rollers to the auxiliary thread draw-off rollers.

4. Apparatus according to claim 3, characterised in that the draw-off roller and the auxiliary draw-off rollers have a common driven roller and individual presser rollers bearing against the driven roller.

5. Apparatus for performing the method claimed in claim 2 having a thread catcher device in the vicinity of a bobbin edge, in which said means for picking up and guiding the thread bears, at its working end, two thread guides and is movable, together with these thread guides, into the working range of the thread catcher device, characterised in that the thread guide lying remote from the bobbin centre merges into a recess which extends obliquely in the direction of the working end, lying remote from a handle of the thread catcher device and of the drawing zone, a cutter being arranged at the end of the recess.

6. Apparatus according to claim 5, characterised in that the thread guide nearest the bobbin centre is constructed as a U-shaped recess which is open at its end lying remote from the zone between the yarn forwarding rollers and the auxiliary draw-off rollers.

7. Apparatus according to claim 5 or 6, in which the thread catcher device is consti-



* C L M S *

17

5 tuted as a thread catcher lug which defines a
slot open in the direction of rotation of the
bobbin, characterised in that the thread
catcher lug is arranged on a bobbin flange
10 having a diameter projecting beyond the
bobbin, and the thread guide lying remote
from the bobbin centre and remote from the
zone between the thread forwarding rollers
and the auxiliary draw-off rollers extends,
when positioned in the working range of the
thread catcher lug, further towards the
bobbin axis than the thread guide lying
closer to the bobbin centre.

15 8. Apparatus according to claim 7, char-
acterised in that the bobbin flange has a
recess which partially receives the bobbin,
and an external surface which annularly
surmounts the end of the bobbin and de-
scends conically towards the bobbin centre.

20 9. A method of receiving a thread and
delivering it to a bobbin after a bobbin
change substantially as hereinbefore de-
scribed.

25 10. Apparatus for performing a method
in accordance with claim 1 and constructed
substantially as hereinbefore described with
reference to, and as shown in, the accom-
panying drawings.

30

MARKS & CLERK

Printed for Her Majesty's Stationery Office,
by Croydon Printing Company Limited, Croydon, Surrey, 1980.
Published by The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.



* C L M S *