(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 069 708**
A1

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: 82830147.3

(22) Date of filing: 31.05.82

(51) Int. Cl.³: B 65 H 69/00
B 65 H 63/00

(30) Priority: 25.06.81 IT 8342381

(43) Date of publication of application:
12.01.83 Bulletin 83/2

(84) Designated Contracting States:
AT BE CH DE FR GB LI LU NL SE

(71) Applicant: OFFICINE SAVIO S.p.A.
Via Udine 105
I-33170 Pordenone(IT)

(72) Inventor: Speranzin, Claudio
Via Gemelli, 7
I-33170 Pordenone(IT)

(72) Inventor: Gaiotti, Ugo
Via Vallone, 59
I-33170 Pordenone(IT)

(74) Representative: Petraz, Gilberto
G.L.P. S.a.s. di Gilberto Petraz P.le Cavedalis 6/2
I-33100 Udine(IT)

(54) **Device for checking knots and for controls downstream from the slub catcher in winding machines.**

(57) The invention concerns a device (10) for checking knots and for controls downstream from the slub catcher in winding machines, said device being able to check the yarn (12) after the latter has passed through the slub catcher (37), and comprising:

- means (11) for checking with blade means (13), and
-means (18) for causing the opening of said blade means (13), whereby re-positioning means (39) and means (17) to regulate the opening of said blade means (13) are included.

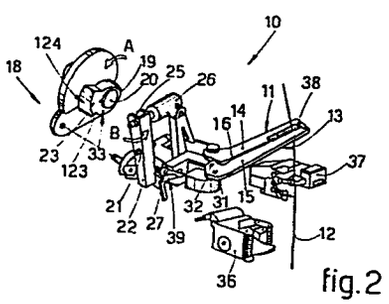

fig.2

EP 0 069 708 A1

Description of the invention entitled
"DEVICE FOR CHECKING KNOTS AND FOR CONTROLS DOWNSTREAM FROM THE SLUB CATCHER IN WINDING MACHINES"
in the name of OFF. SAVIO S.p.a. at Pordenone

****

This invention concerns a device for checking knots and for controls downstream from the slub catcher in winding machines.

To be more exact, the invention concerns a device which enables the quality of the knots to be checked as soon as knotting has taken place and which makes it possible to ascertain whether the yarn rising towards the yarn package during winding contains tangles, slubs, broken ends of thread or other like faults.

Some devices are hnown which perform the task of a slub catcher and check the knots as soon as the latter are formed.

Infact search RS 64371 IT made at the European Patent Office reveals various devices of this type as described in DE-A-2.705.080, DE-B-2.934.544, GB-A-726.294, GB-A-596.999, CH-A-507.145 and DE-B-2.543.983.

Nevertheless these known devices are rather complicated and require complicated actuation means.

Furthermore alongside some of said devices for better results another device may be required to carry out proper

controls downstream from the slub catcher and to be able to eliminate tangles in the yarn rising towards the yarn package, thereby improving the control already performed by the slub catcher.

A purpose of the invention is to embody an improved single device for checking knots and for the controls downstream from the slub catcher, whereby said device is simple in construction reliable and provides easy operation and adjustment.

Another purpose of the invention is that the control on the yarn to be wound may also be conducted while said yarn is being transferred from the knotting position to the position of the slub catcher, thereby substantially providing a continuous inspection of said yarn during the whole winding cycle.

So as to fulfil said purposes, the device of the invention comprises two blade means for controlling and guiding the yarn which extend lengthwise above the knotter and above the slub catcher so as to cooperate with both of them, whereby one of said blade means is located in a pre-set and perhaps adjustable position, and whereby the other blade can be moved or rotated from its open position of rest to its closed working position.

The length of time of the conditions of rest or of work can be varied by altering the reciprocal positions of reading means and two-can means which cooperate with each other, whereby the position of said reading means can be regulated axially.

This invention is therefore embodied in a device for checking knots and for controls downstream from the slub catcher in winding machines, said device being characterized by comprising:

- means for checking the yarn with blade means, and
- means to cause the opening of blade means,

whereby re-positioning means and means to regulate the opening of blade means are included.

We shall give hereinafter a description of a preferential embodiment of the invention as a non-restrictive example and shall make references to the attached table, where in:

Fig. 1 gives a three-dimensional view of the device of the invention in its position of rest;

Fig. 2 gives a three-dimensional view of the device of Fig.1. in its working position;

Fig. 3 shows a plan view of the two-blade means which check the yarn;

Fig. 4 gives a side view of a detail, cut away along the line C-C, of the means which regulate the opening of the two blades.

in the figures the same parts or parts performing the same functions bear the same reference numbers.

In particular, the device 10 of the invention comprises means 11 for checking the yarn 12 with blade means 13, whereby said blade means 13 consist of a fixed blade means 14 and of a blade means 15 which can be moved and be at least partially rotated, said two blade means being reciprocally positionable.

The opening or slit 16 between said two blade means 14 & 15 within which the yarn 12 is guided and slides, is obtained by regulating the reciprocal positions of said blade means 14-15 by means of suitable adjustment means 17.

In particular, said opening is dimensioned to suit the basis of the diameter thereof and in relation to the size of the faults and knots to be eliminated.

For this purpose it is enough to regulate the axial position of a screw 40 engaged in a threaded through hole 43 in the blade 14 and connected (44) correspondingly to the stationary structure 26.

The position of said blade 14 and said stationary structure 26 are maintained temporily by the action of a thrust spring 41, whereby said blade 14 is hinged (42) onto the stationary structure 26 and rotates as an outcome of axial displacement of the screw 40 so as to enable the breadth of the lengthwise slit 16 to be varied, as shown in Fig. 4.

Figs. 1 & 2 show the means 18 which operate the opening of the blades 14-15 and which consist of a cam 19 shown in an exploded view and keyed to the horizontal knotting shaft 20, and of a reading pin 21 passing through an oscillating arm 22.

The axial position of said reading pin 21 can be regulated so that said pin 21 can cooperate with one of two circular crowns 23-123, which are radially superimposed one above the other and into which the cam 19, rotating in direction A (Figs. 1 and 2), is divided so as to obtain a differing length of time for the opening or closing of the blades 14-15.

In our example the circular crown 23 permits said blades 14-15 to be closed for a period limited to the knotting phase, whereas the crown zone 123 causes said bladed 14-15 to be closed during the normal winding phase.

When the reading pin 21 acts on the sloping sector 24 of the radial crown 23 (Fig. 1), thè oscillating arm 22, being hinged at its top 25 to the stationary structure 26, is kept in its position of rest by suitable re-positioning means 39, which consist of a piston 29 pressed by a thrust spring 27 with which said piston cooperates coaxially.

In particular, said spring 27 is kept under axial compression between the end 30 of said piston 29 pushing against said oscillating arm 22, and a resistance point 28 on the stationary structure 26.

The other end 130 of the piston 29 keeps in a retracted or

non-operational position the rotating blade 15, onto which the said end 130 is hinged (31).

Said rotating blade (15) comprises a second pivot 32 near to the proceding pivot 31, whereby said pivot 32 enables said blade 15 to rotate around the stationary structure 26 with an arm of rotation of which the length is equal to the distance betweene the two pivots 31-32 located in the end 45 of said rotating blade 15.

Fig. 1 shows the position of rest of the device 10, whereas Fig. 2 shows the same device 10 in its working position.

In particular, in Fig. 2 the reading pin 21 cooperates with the sector 124 of the circular crown 123 of the double cam 19 and, to be more exact, with the front part 33 thereof. 19.

In such working conditions the oscillating arm 122 is rotated in direction B and pushes against the piston 29, thereby compressing the thrust spring 27.

In its turn said piston 29 makes the blade 15 revolve into the closed or working position by means of its end 130 hinged 31 onto said blade 15.

Thus the checking of the knot just formed can be carried out in a position or zone 34 of the lengthwise slit 16 above the knotter 36.

The yarn 12 can be transferred thereafter by sliding tangentially on the fixed blade 14 up to the opposite zone 134 of said slit 16 abcve the slub catcher 37, said zone 134 corresponding to the position where said yarn 12 passes during the winding phase, as shown in Fig. 3. In Fig. 3 the mcvable blade 15 is shown with lines of dashes when it is in its position of rest (opened) and with a continuous line when it is in its (closed) working position.

Said fixed blade 14 comprises in said zone 134 a tangential porcelain guide 35, which enables said fixed bade 14 to

cooperate better with the yarn 12 tangentially thereupon, and also comprises a protruding terminal stop 38, which prevents said yarn 12 from escaping the control of the blade means 13.

When the reading pin 21 acts on the radial zone 23 of cam 19, the movable blade means 15 is returned to its retracted position as soon as said reading pin 21 enters the sector 24.

Instead, when the reading pin 21 cooperates with the circular crown 123, the rotating blade 15 stays closed against the fixed blade 14 so as to carry out therewith its controls downstream from the slub catcher.

We have described here a preferential embodiment of the invention, but variants are possible for a technician in this field.

Thus the shapes and sizes can be changed. It is possible to envisage a different system of cooperation between the means which re-position 39 the blade, or else it is possible to foresee the use of means which are mechanically different but which are able to perform the functions described. It is possible to visualize the employment of multiple-cam means having a number of circular crowns other than two.

These and other variants are all possible for a technician in this field within the scope of the idea of the solution of the invention.

CLAIMS

1. Device (10) for checking knots and for controls downstream from the slub catcher in winding machines, said device being able to check the yarn (12) after the latter has passed through the slub catcher (37) and being characterized by comprising:
-means (11) for checking with blade means (13), and
-means (18) to carry out the opening of said blade means (13), whereby re-positioning means (39) and means (17) to regulate the opening of said blade means (13) are included.

2. Device (10) for checking knots and for controls downstream from the slub catcher in winding machines, as in Claim 1, characterized by the fact that the means (11) for checking with blade means (13) comprise fixed blade means (14) and also corresponding blade means (15) which can be moved and be at least partially rotated, whereby said blade means (14-15) can be reciprocally positioned at least partially and are aligned above the knotter (36) and slub catcher (37) of said winding machines, and whereby a slit (16) for the checking and sliding of the yarn is located between said temporarily closed blade means (14-15).

3. Device (10) for checking knots and for controls downstream from the slub catcher in winding machines, as in Claims 1 and 2, characterized by the fact that the movable blade means (15) is hinged at two points (31-32) and is linked at one of its ends (45) to the stationary structure (26) and to the re-position means (39) respectively, whereby said end hinged at two points (31-32) acts as an arm of rotation for said movable blade means (15).

4. Device (10) for checking knots and for controls downstream from the slub catcher in winding machines, as in Claim 1 and in one of the other of the Claims thereafter, characterized by the fact that the fixed blade (14) comprises a protruding stop (38) which delimits the crosswise travel of the yarn (12).

5. Device (10) for checking knots and for controls downstream from the slub catcher in winding machines, as in Claim 1 and in one or another of the Claims thereafter, characterized by the fact that the fixed blade (14) comprises a lengthwise guide (35) for the yarn (12) in at least part of the zone (134).

6. Device (10) for checking knots and for controls downstream from the slub catcher in winding machines, as in Claim 1 and in one or another of the Claims thereafter, characterized by the fact that the means (18) which cause the opening of the blade means (13) comprise a cam (19) having at least one distinct circular crown (23-123) which cooperates radially with a reading pin (21) passing through an oscillating arm (22), whereby the position of said reading pin (21) can be regulated so as to cooperate or interfere with at least one of said circular crowns (23-123) of said cam (19).

7. Device (10) for checking knots and for controls downstream from the slub catcher in winding machines, as in Claim 1 and in one or another of the Claims thereafter, characterized by the fact that the re-positioning means (39) comprise a piston (29) which cooperates at one of its ends (30) with the oscillating arm (22), whereby its other end (130) is hinged (31) onto the movable blade (15), and whereby said piston (29) moves so as to keep said movable blade (15) in a retracted or open position, said piston (29) being thus moved owing to the action of a thrust spring (27) which is positioned coaxially with said piston (29) and is compressed axially betweene said end (30) and a resistance point (28) on the stationary structure (26).

8. Device (10) for checking knots and for controls downstream from the slub catcher in winding machines, as in Claim 1 and in one or another of the Claims thereafter, characterized bY the fact that the means (17) which regulate the opening of

the blade means (13) consist of a screw (40) engaged in a threaded through hole (43) in the fixed blade (14) and connected correspondingly (44) to the stationary structure (26), whereby the positions of said blade (14) and said stationary structure (26) are maintained temporarily owing to the action of the thrust spring (41) which is pre-arranged coaxially with the screw (40) between said blade (14) and the stationary structure (26), and wherebu said blade (14) is hinged (42) onto the stationary structure (26) and rotates as an outcome of the axial displacement of the screw (40) so as to enable the breadth of the lengthwise slit (16) to be varied.

0069708

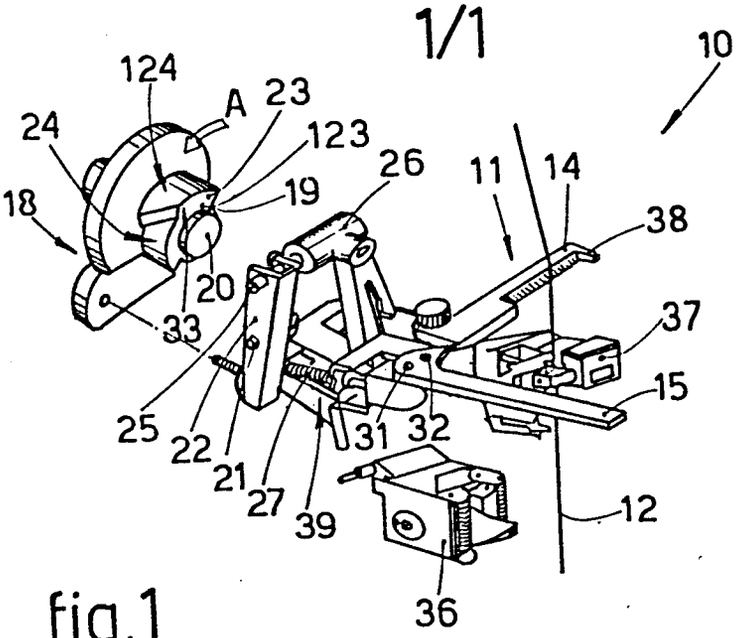

fig.1

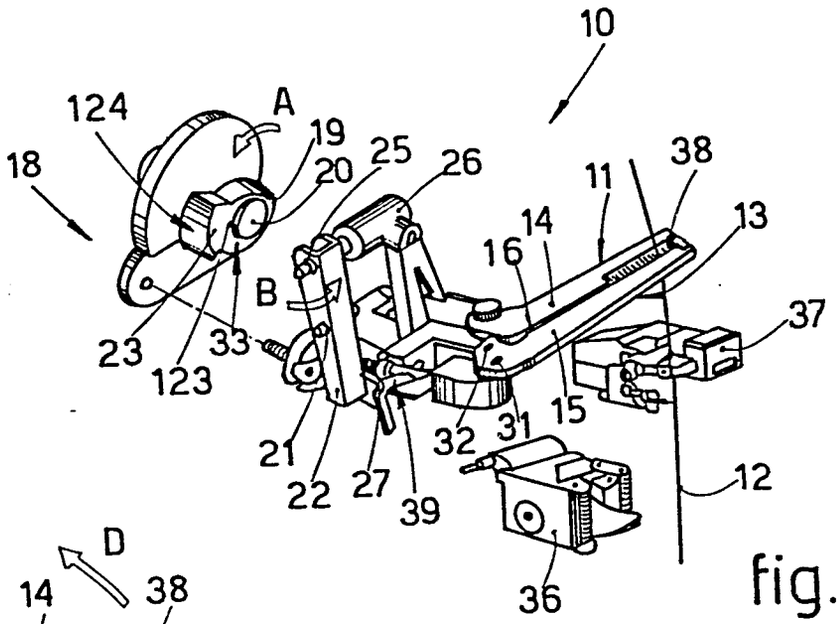

fig.2

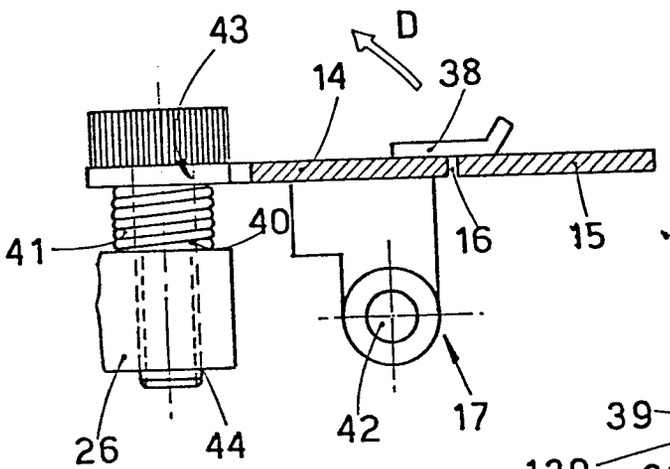

fig.4

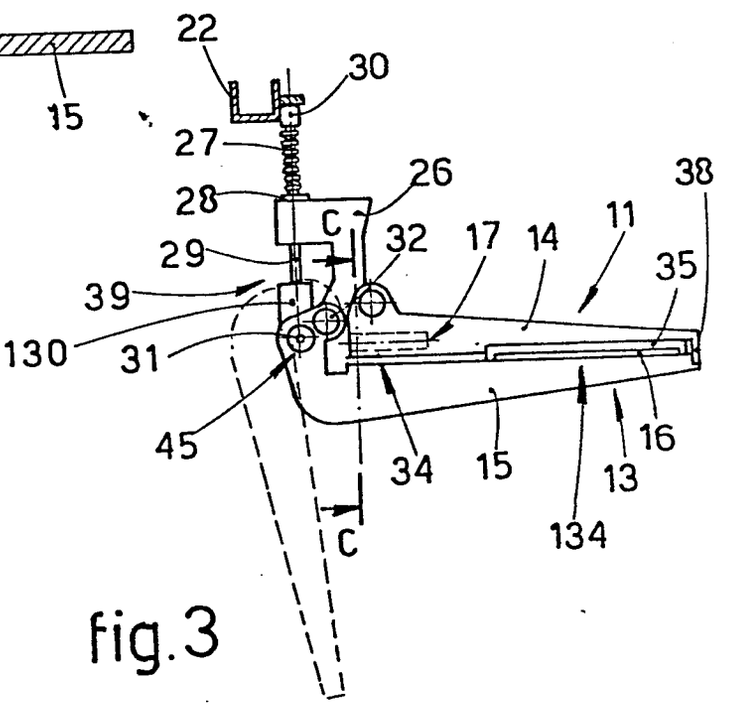

fig.3

0069708

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 82 83 0147

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
D	DE-A-2 705 080 (K.MAYER) *The whole document*	1,2	B 65 H 69/00 B 65 H 63/00
D,A	DE-B-2 934 544 (K.MAYER)		
D,A	GB-A- 726 294 (ZELLWEGER)		
D,A	GB-A- 596 999 (J.E.DOLL)		
D,A	CH-A- 507 145 (ELITEX)		
D,A	DE-B-2 543 983 (K.MAYER)		TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			B 65 H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	05-10-1982	DEPRUN M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO Form 1503. 03.82