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⑦① Applicant: Monti, Mario
Via Marconi, 108
I-36016 Thiene (VI)(IT)

⑦② Inventor: Monti, Mario
Via Marconi, 108
I-36016 Thiene (VI)(IT)

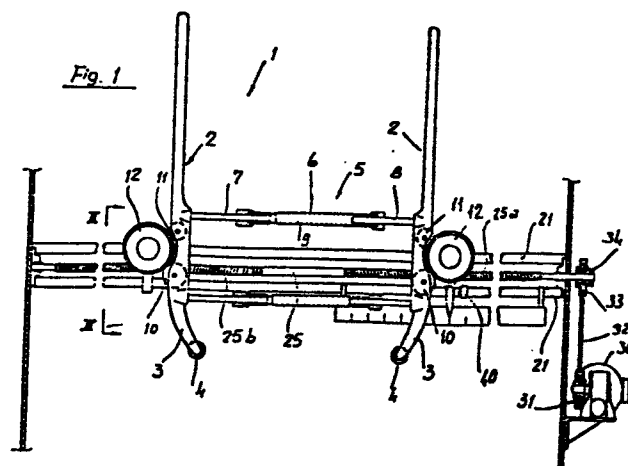
⑦④ Representative: Cicogna, Franco
Ufficio Internazionale Brevetti Dott.Prof. Franco Cicogna
Via Visconti di Modrone, 14/A
I-20122 Milano(IT)

⑤④ A stretching device for tubular fabrics for pre-shrinking calenders.

⑤⑦ A stretching device for tubular fabrics to be introduced to pre-shrinkage calenders comprises a caliper (1) formed by two parallel arms (2) held apart by a resilient thrust device (5) comprising a tubular member (6) housing a spring (9) urging two needle-like thrust members (7,8) apart; the caliper arms (2) each carry a pair of rollers (10,11) and each pair of rollers engages a respective grooved wheel (12). In use the tube of fabric passes between the rollers (10,11) and the grooved

wheels (12) and is guided into the calenders by the caliper arms (2).

The grooved wheels (12) are carried by threaded support blocks (20) carried on opposite threaded portions (25a, 25b) of a lead screw (25) which is turnable by means of a motor (30) in one direction or the other to cause the blocks (20), and therefore the arms (2), to move towards or away from one another.



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"A stretching device for tubular fabrics for pre-shrinking calenders"

5 The present invention relates to a stretching device which is usable for tubular fabrics which are to undergo pre-shrinkage and heat fixing by means of calenders.

10 As is known, felt calenders for pre-shrinkage or decatizing and heat fixing, are currently used with devices which have the function of holding the tubular fabric to be treated at a desired width. The fabric is then conveyed into the calender which is provided with heated presser cylinders the operation of which is to make the tubular fabric assume a stable dimension.

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In the known machines for this purpose there is an expander/introducer device on a conveyor unit movable along longitudinally disposed guide shafts. Such conveyor units are substantially constituted

5 by a peripherally grooved wheel which turns in contact with two opposite pressure wheels fitted to an expander caliper. These wheels allow the fabric to be conveyed and guided at a chosen width during the introduction of the fabric into the cal-

10 ender during the time which precedes the actual calendering treatment. In the operation of these conventional machines it is necessary to perform complex adjustments, which include preliminary manual adjustment of the expander/introducer de-

15 vice, subsequently positioning onto it the tubular fabric to be treated, and then performing a test to establish if the dimension achieved corresponds to that required.

20 If, as very frequently happens, the final width of the fabric must then be modified, it is currently necessary to reverse the movement of the calender to withdraw the fabric, remove the fabric from the introducer/expander device and, subsequently, to

25 perform a new adjustment of the width of the introducer/expander device. As is apparent, these operations are rather complex and must be repeated many times during the course of the work, taking also into consideration the fact that it not in-

30 frequently happens that, due to external environ-

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mental factors, the dimensions which are obtained during the calendering actually vary, necessitating further adjustments in the middle of the working phase.

5

This kind of procedure requires a significant manual labour content and causes a significant slowing of the various production phases, with an inevitable detrimental effect on the production costs.

10

The present invention seeks to provide a device in which the above indicated disadvantages are at least substantially avoided, that is a stretching unit for pre-stretching and heat fixing calenders for tubular fabrics, which will give the possibility of radically simplifying all the previously listed operating stages, offering the possibility of automatically regulating the width obtainable in the calendered fabric without having to provide for the removal of the fabric being worked to effect a new adjustment.

According to the present invention, therefore, there is provided a stretching device for tubular fabrics, for pre-shrinkage and heat fixing calenders, characterised in that it comprises a stretcher caliper constituted by two oppositely positioned arms between which act resilient telescopic thrust means each arm carrying two rotatable pressure wheels engageable with the periphery of a respective grooved wheel retaining the tubular fabric therebetween, the said groove wheels being rotatably supported by blocks slidable on guide shafts and engaging

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with oppositely threaded portions of a threaded rod,
the said threaded rod being connected to be driven
by a geared motor which can turn in one sense to
cause relative approaching movement of the said blocks
5 and, in the opposite sense, to cause relative separating movement of the blocks.

An advantage of devices formed as embodiments of
the present invention is that they give the poss-
10 ibility of adjusting the width of the fabric even
during the course of working, thus having the poss-
ibility of automatically following any possible widen-
ing or narrowing of the fabric due to changes in
environmental factors during the calendering oper-
15 ation, for the purpose of achieving a given desired
width at the output, and all without the necessity
of the various and complex operations previously
needed by the prior art devices for this purpose.

20 Another advantage of the present invention is that
it is possible to have a completely automatic oper-
ation, with safety devices being provided to reg-
ulate, with precision, all the critical factors
relating to the minimum and maximum widths which
25 can be imposed on the fabric. Embodiments of the
present invention also have the advantage of being
able to offer the widest guarantees of reliability
and safety in use.

30 One embodiment of the present invention will now
be more particularly described, by way of example,
with reference to the accompanying drawings, in
which:

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Figure 1 is a schematic representation of a stretcher unit according to the invention seen from the front, and

5 Figure 2 is a sectional view taken on the line II-II of Figure 1.

Referring now to the drawings, the fabric stretching unit for use with pre-shrinkage and heat fixing calenders comprises a stretcher caliper generally
10 indicated with the reference numeral 1 which is constituted by two arms 2 which extend in the longitudinal direction of advance of the tubular fabric, and over which, in use of the device, the tubular fabric is passed on its way to the calenders.
15 The separation of the caliper arms 2 determines the stretching of the fabric tube. The arms 2 are disposed in mutually opposite positions and, at a lower end, at which they are introduced into the fabric tube, have a rounded initial portion 3
20 provided with an introduction roller 4 to ease introduction of the arms into the tube.

The arms 2 are urged apart by resilient, telescopic, thrust means generally indicated with the reference
25 numeral 5, which in this embodiment comprise a tubular housing section 6 within which slide two needle-like rods 7 and 8 extending away from one another towards respective arms 2. A compression spring, indicated 9, urges the rods 7 and 8 apart,
30 therefore biasing the caliper arms 2 outwardly away from one another.

The telescopic resilient means have the important

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function of exercising a balanced thrust action on the caliper arms 2 to maintain these parallel with one another.

- 5 The said caliper arms 2 each carry a pair of pressure rollers, indicated 10 and 11, which engage with the periphery of a respective peripherally grooved wheel 12. The said resilient thrust means 5 are symmetrically disposed, with respect to the two axes of rotation of the peripherally grooved wheels 12, in such a way as always to exercise a balanced resilient thrust. The grooved wheels 12 are themselves rotatably carried by blocks 20 which are slidably guided on guide rods 21 which extend transversely with respect to the direction of advance of the tubular fabric to be calendered. The blocks 20 engage respective oppositely threaded portions, indicated 25a and 25b, of a lead screw 25 which, upon being rotated, causes the two blocks 20 supporting the grooved wheels 12 to displace in mutually opposite directions in such a way as to obtain, as will be seen more clearly below, mutual approach or separation.
- 25 The lead screw 25 is connected to be driven by a geared motor 30 which is able to rotate in one directional sense, to obtain relative approach of the blocks 20, or in the opposite directional sense, to obtain separation thereof. The movement of the motor 30 is transmitted to a drive pulley 31 which, by means of a belt 32, puts into rotation a driven pulley 33 which is connected, with the interposition of friction means 34 constituting a slipping clutch,

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with the said lead screw 25 in such a way as to be able to cause it to rotate when driven.

5 The presence of the slipping clutch 34 is important in that, when the blocks have approached to the minimum distance, it allows rotation of the pulley 33 to continue without forcing the rod, which otherwise would be subjected to excessive torsional moments.

10 It is suitable to underline that on one guide rod 21 there is provided an end-of-stroke microswitch 40 which is actuated by one of the blocks when it reaches the maximum width set by the arms.

15 The operation of the stretcher unit described above is extremely simple. In fact, after having preliminarily introduced the ends 3 of the arms 2, carrying the sheels 4, into the tubular fabric and having introduced the fabric between the wheels 10 and 11
20 and the respective grooved wheels 12, a first setting of the width can be performed to determine the position of the blocks 20 by actuation of the geared motor 30. If the set width does not correspond to the desired width of the textile it is sufficient,
25 without removing the fabric tube from the stretcher calipers 1, to adjust the spacing of the arms 2, which is always possible without interrupting the work.

30 During the various working phases of the calender, moreover, it is always possible, whenever required, to intervene, again without removing the fabric from the stretcher calipers, to modify the width of the stretcher calipers in such a way as always to obtain

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the precise desired dimension of the output fabric.

It is to be noted that the stretcher device described above has a completely automatic operation which
5 makes it possible to effect all the adjustments to the stretch of the fabric without having to perform any dismantling or manual adjustment, or needing to repeat operations in succession to obtain the perfect setting, as occurs in currently known machines.

10

Moreover, the presence of the resilient thrust means is of great importance since this allows a resilient movement of the arms 2 of the stretcher calipers to be obtained whilst always maintaining perfect parallelism between them thanks to the fact that there
15 are provided a pair of resilient means which are equal to one another and which act symmetrically with respect to the line which joins the axes of rotation of the grooved wheels 12, against which the
20 pressure wheels 10 and 11 engage.

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Claims:

1. A stretching device for tubular fabrics, for pre-shrinkage and heat fixing calenders, character-
5 ised in that it comprises a stretcher caliper (1) constituted by two oppositely positioned arms (2) between which act resilient telescopic thrust means (5), each arm (2) carrying two rotatable pressure wheels (10,11) engageable with the periphery of a
10 respective grooved wheel (12) retaining the tubular fabric therebetween, the said grooved wheels (12) being rotatably supported by blocks (20) slidable on guide shafts (21) and engaging with oppositely threaded portions (25a,25b) of a threaded rod (25),
15 the said threaded rod (25) being connected to be driven by a geared motor (30) which can turn in one sense to cause relative approaching movement of the said blocks (20) and, in the opposite sense, to cause relative separating movement of the blocks (20).
20
2. A stretching device according to Claim 1, characterised in that the arms (2) of the said stretcher caliper (1) have, at one end thereof, a rounded portion (3) carrying an introduction
25 roller (4).
3. A stretching device according to Claim 1 or Claim 2, characterised in that it includes a pair of telescopic resilient thrust means (7,8) acting on
30 points on the arms (2) equally spaced from a line joining the axes of rotation of the two peripherally grooved wheels (12).
4. A stretching device according to any pre-

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ceding Claim, characterised by the fact that the said resilient telescopic means (5) are constituted by a tubular element (6) slidably engaging with needle-like elements (7,8) extending from the said arms,
5 a spring (9) being housed in the said tubular element (6).

5. A stretching device according to any preceding Claim, characterised by the fact that the
10 said geared motor (30) is connected to the said threaded rod (25) via a slipping clutch (34).

6. A stretching device according to any preceding Claim, characterised by the fact that the said
15 geared motor (30) is connected to a drive pulley (31) over which passes a transmission belt (32) for transmitting drive to a driven pulley (33) associated with the threaded rod (25), with the interposition of the said slipping clutch (34).

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7. A stretching device according to any preceding Claim, characterised by the fact that it includes a microswitch actuatable by one of the said blocks (20) to define the maximum separation of the
25 said arms (2).

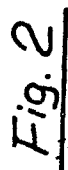


Fig. 1



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. 4)
A	FR-A-2 119 717 (SAMCOE) * Whole document *	1,3	D 06 C 5/00
A	FR-A-1 344 574 (SAMCOE) * Whole document *	1-3	
A	US-A-3 882 577 (ARONOFF)	2	
A	US-A-4 103 402 (SAMCOE)		
A	US-A-4 146 946 (SAMCOE)		
A	US-A-3 955 251 (HOGENDYK)		TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
A	GB-A-2 017 181 (SAMCOE)		D 06 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25-04-1986	Examiner PETIT J.P.
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			