



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 357 217 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.10.2003 Bulletin 2003/44

(51) Int Cl.7: **D06C 21/00, D06C 27/00**

(21) Application number: **03012418.4**

(22) Date of filing: **30.05.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

(72) Inventors:
• **Riccioni, Marco**
Busto Arsizio (VA) (IT)
• **Pilgaard, Henrik Lasse**
Verghera di Somarate (VA) (IT)

(30) Priority: **26.07.2002 IT MI20021678**

(74) Representative: **Parisi, Luigi et al**
Ufficio Internazionale Brevetti,
Ing. C. Gregorj S.p.A.
Via Dogana 1
20123 Milano (IT)

(71) Applicant: **MUZZI COSTRUZIONI MECCANICHE**
S.R.L.
21052 Busto Arsizio (VA) (IT)

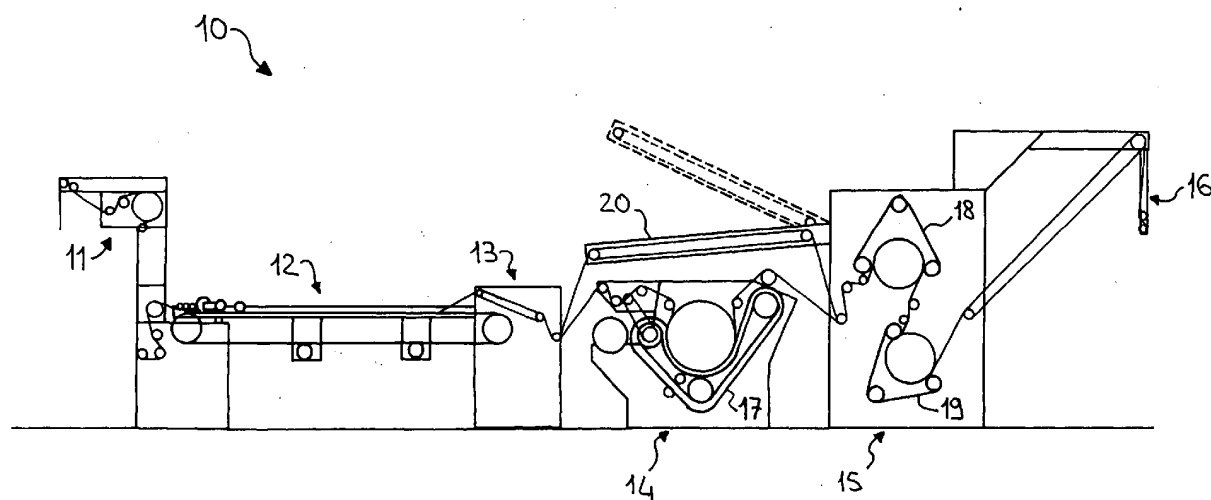
(54) **Fabric finishing range and process for fabric finishing**

(57) The present invention refers to a textile finishing range that is at least composed of one moisturising unit, a compressive shrinking unit, a conveyor belt, and a compacting unit; the range is equipped with means

that allow the passage of the fabric either into the compressive unit or directly into the compacting unit, or, successively, into both compressive and compacting units.

This invention also refers to a process for fabric finishing.

Fig. 1



EP 1 357 217 A2

Description

[0001] This invention refers to a textile finishing range and to a fabric finishing process.

[0002] Nowadays, the fabric dimensional stability has a great importance in the finishing processes.

[0003] With regards to this, a well-known industrial method called "the compressive method" is implemented by using a thick rubber belt.

[0004] This method solved the problems related to fabric shrinkage and fabric dimensional stability, that had been previously only partially overcome by means of rudimentary techniques.

[0005] However, even if the compressive system yielded good results in terms of fabric shrinkage and stability, it left other problems related to fabric finishing unsolved.

[0006] Indeed, as time went by, fashion requirements became increasingly demanding. For example, the fabric look, hand and colour intensity gradually became of paramount importance.

[0007] The purpose of fabric shrinking is the removal, or at least the significant reduction, of the tensions which have been gathering in the fabric fibres throughout the yarn construction processes, throughout the weaving process and during the finishing cycles.

[0008] On the other hand, reducing tensions also means changing the dimensions of the fabric, since, if a fabric shrinks, its longitudinal and transversal dimensions become smaller, in other words it becomes shorter and narrower.

[0009] This explains the technical name "fabric compacting", since the fabric fibres (threads) get closer to each other.

[0010] In the textile technical terminology a distinction is drawn between the meaning of "shrinking" and "compacting", even if in practice they are used to indicate the same concept.

[0011] The terms "shrinking" or "sanforizing" indicate the compressive method; "compacting" indicates the methods by which the fabric is not mechanically forced to shrink, but in some way put in the condition to do so.

[0012] In the compressive method, because of the surface speed variation given by the rubber belt compression, the fabric cannot avoid shrinking.

[0013] In the compacting method, the fabric is not forcefully obliged to shrink, but it is in some way "invited" to shrink, and, as is always the case in nature, if there is no real compulsion the process will not be fully effected.

[0014] However, with this method it is possible to obtain other results, that are not achievable with the previous method.

[0015] For example, some types of fabric get a rather rigid hand when compressed.

[0016] With the compressive system, plush is slightly flattened.

[0017] High shrinkage values can produce optical effects, which are different from those of the original fabric,

sometimes giving the impression that the dye colour has partially faded.

[0018] This is only an optical impression, since there are no actual traces of colour loss: in fact the fabric resumes its original hue when washed.

[0019] The compacting process can be implemented by means of dryers provided with a vibrating conveyor belt, or else by means of machines provided with thick felt blankets.

[0020] However, it is easy to understand that either method, and consequently any machine based thereon, presents deficiencies which can often be detrimental.

[0021] On the other hand, the market is nowadays extremely demanding and requires without exceptions that the fabric should have definite characteristics and properties. For a finishing plant to meet all market requirements, the only possibility is to use two types of machines, one based on the compressive system and the other based on the compacting one.

[0022] Also the widespread use of knitted fabrics, which on account of their delicate nature require particular features, often makes it necessary to use both kinds of machines.

[0023] The purpose of this invention is therefore to solve the above problems, designing a range made up of a sequence of units that are suitable to obtain a very high shrinkage without compromising the soft hand due to fibre swelling.

[0024] Another purpose of this invention is to design a range that offers great versatility combined with economic advantages.

[0025] This invention achieves these two aims through a range as specified in claim 1, to which reference is made for the sake of brevity.

[0026] Other characteristics of this invention are explained in the following claims.

[0027] The claimed invention also includes a process for fabric finishing.

[0028] The invention is hereinafter described in detail, by way of example and without limitation thereto, referring to the attached drawing, wherein:

- Fig. 1 shows an outline view of the range according to the present invention.

[0029] With reference to Fig. 1, the range for fabric finishing, according to the present invention, is composed of the following main parts and the range is indicated as a whole under number 10.

[0030] First of all there is a driven expander centerer guiding device 11, and a vertical or horizontal chain stretcher 12.

[0031] The range 10 is provided with a group composed of a conveyor belt and a moisturising unit 13 and a compressive shrinking unit 14.

[0032] The range 10 finally includes a compacting unit 15 and an exit by fold 16.

[0033] Both woven and knitted fabric (which will be

collectively called "fabric" to designate both the fabric made with weft and yarn and the knitted fabric of any type) can be fed into the range 10 both by roll and by fold.

[0034] The fabric undergoes the first moistening which can be achieved by any kind of moisturiser, either by means of steam or water, for instance by means of the unit 13.

[0035] Subsequently there are three possibilities, depending on the type of fabric and on the desired finishing result.

[0036] The first possibility envisages that the fabric will transit through the compressive shrinking unit 14 provided with a rubber belt (Sanfor).

[0037] The second possibility envisages the the fabric will go directly into the compacting unit 15 which is composed of two elements, each of which is made up of a rotating cylinder, heated by means of steam, diathermic oil or electricity, around which a felt belt rotates. (This felt belt is usually made of nomex or polyester or other material resisting to high temperatures of at least 150°C - 180°C).

[0038] For this direct passage it is possible to use the oscillating conveyor belt 20.

[0039] The third possibility envisages that the fabric will go at first into the compressive shrinking unit 14 provided with a rubber belt (Sanfor), and subsequently, without interruptions, into the compacting unit 15 provided with synthetic belts, as described above.

[0040] As already mentioned, this invention has given a universal character to a process that previously required two distinct or alternative operations.

[0041] The main cases that can be considered are the following.

[0042] First case: delicate knitted fabric meant for a very soft hand following shrinking; after being moisturised, the fabric is deposited onto a conveyor belt and by means of overfeeding the fabric is relaxed and goes into the unit provided with the two felt belts.

[0043] Second case: dyed fabric which, due to the previous treatment, should not be fed into the rubber belt compressive unit, because the fabric might take on a different hue.

[0044] In this circumstances as well, after moisturising, the fabric transits through the conveyor belt into the compacting unit 15 equipped with synthetic material belts 18, 19.

[0045] Third case: heavy fabric, that needs a high shrinkage, but at the same time must have a soft hand: in this case the fabric must be very well moisturised by means of one or two moisturising cylinders, or by means of a steaming unit, or a water sprayer. Afterwards it is fed into the compressive unit 14 (provided with rubber belt 17) and out of this into the compacting unit 15 equipped with the two synthetic felt belts 18, 19.

[0046] With this process the following results and important advantages are achieved.

[0047] First of all, a high shrinkage is obtained in the first unit.

[0048] In addition, a further shrinkage is possible in the second unit .

[0049] Another advantage is given by the soft hand due to fibre swelling during the passage in the second unit.

[0050] As a matter of fact, this fibre swelling is caused by the evaporation of the fibre residual humidity, thus providing the fabric with softness and a nice look.

[0051] The inventiveness of the range which is the subject matter of this invention consists of a synthesis of the pre-shrinking process for woven and knitted fabrics.

[0052] This allows finishing Companies, especially those who work for third parties, to avoid all problems related to the type of desired result for any textile product that needs to be processed in a similar range.

[0053] The present invention is susceptible of numerous changes and variations, all comprising the inventive concept expressed in the attached claims, whereas the technical details may vary according to the different needs.

Claims

1. Textile finishing range, **characterised in that** it includes at least one moisturising unit, one compressive shrinking unit, one conveyor belt and one compacting unit, wherein the above mentioned range has devices for the passage of the above mentioned fabric either into the compressive shrinking unit or directly into the compacting unit, or else successively into both the compressive shrinking unit and the compacting unit.
2. Textile finishing range, as described in claim 1, **characterised in that** the above mentioned compacting unit is composed of at least two elements, each of them made up of a cylinder, heated by means of steam, diathermic oil, or electricity, around which a felt belt rotates.
3. Textile finishing range, as described in claim 2, **characterised in that** the above mentioned felt belt is made of nomex or polyester or other material resisting to high temperatures of at least 150°C.
4. Textile finishing range, as described in claim 1, **characterised in that** the above mentioned compressive shrinking unit is provided with a rubber belt.
5. Textile finishing range, as described in claim 1, **characterised in that** the above mentioned means that allow the direct passage of the fabric into the above mentioned compacting unit include an oscillating element.

6. Process for finishing fabric, **characterised in that** it comprises a first stage consisting of the passage of the fabric into the compressive shrinking unit and a second stage consisting of the passage of the above mentioned fabric into the compacting unit, wherein said second stage follows said first stage without interruption. 5
7. Process for finishing fabric as described in claim 6, **characterised in that** either said first stage or said second stage can be omitted. 10
8. Process for finishing fabric as described in claim 6, **characterised in that** said first stage follows said second stage without interruption, wherein said second stage only uses a single felt belt. 15

20

25

30

35

40

45

50

55

Fig. 1

