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(54) **Elasticised fireproof fabric and method for the manufacture thereof**

(57) A fireproof fabric comprises elasticised threads (11), each one of which is made with elastic fibre (13) that is completely wrapped by fireproofed fibres (12). The

fireproof fabric can be used to manufacture work garments that in addition to ensuring satisfactory protection from flame and splashes of molten metals is satisfactorily comfortable for the operator.

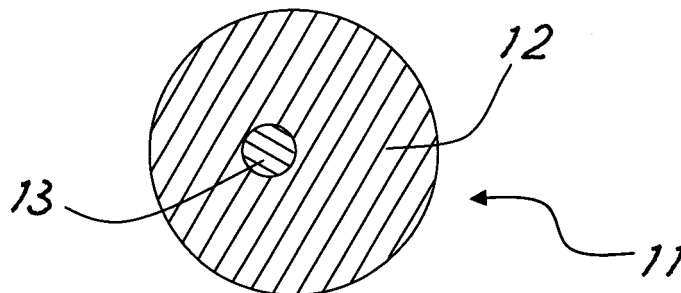


Fig. 1

Description

[0001] The present invention relates to an innovative elasticised fireproof fabric, intended in particular for making work garments. The invention also relates to a work garment made from such a fireproof fabric and a method for the manufacture thereof.

[0002] In the prior art, manufacturing fireproof fabrics suitable for the manufacture of work garments for welders or other workers habitually employed in environments where a burn hazard exists has been known for some time.

[0003] The fabrics can be treated in various manners to be fireproofed, for example by carrying out a Proban bath or by using other techniques that are known in the field.

[0004] The fireproof garments made in the past, nevertheless were substantially stiff and were not satisfactorily comfortable for the operator, sometimes even hampering the liberty of movement of the operator.

[0005] The general objective of the present invention is to overcome the drawbacks mentioned above by providing a fireproof fabric and a fireproof garment that ensure the necessary level of protection (against flames, against splashes of molten metal etc.) and which are at the same time sufficiently comfortable and convenient for the operator.

[0006] A further object of the invention is to provide a rapid and cheap method for manufacturing the aforesaid fireproof fabric.

[0007] In view of these objects, it was decided to make, according to the invention, a fireproof fabric comprising elasticised threads each one of which is made with elastic fibre completely wrapped by fireproofed fibres.

[0008] Still according to the invention, it was decided to provide a method for the manufacture of elasticised fireproof fabrics, comprising the steps of:

- manufacturing elasticised threads, each comprising elastic fibre wrapped completely by external fibres suitable for being treated to be made fireproof,
- weaving a fabric by using at least partially said elasticised threads,
- treating the fabric thereby obtained to fireproof said external fibres.

[0009] In order to make the explanation of the innovative principles of the present invention and the advantages thereof over the prior art clearer, a possible embodiment thereof applying such principles will be disclosed below with the help of the attached drawing.

[0010] Figure 1 is a section view of an elasticised thread 11 of the fabric according to the invention, which comprises elastic fibre 13 completely wrapped by fireproofed fibres 12.

[0011] Advantageously, the elastic fibre 13 is made of Elastan and the external fibres 12 are made of cotton. The Elastan fibre 13 is made of a continuous single fila-

ment.

[0012] According to a preferred embodiment of the invention, in the elasticised threads 11 the elastic fibre 13 is present in a percentage comprised between 0.5% and 10%, advantageously equal to approximately 3%. The remaining 97% of the elasticised thread is cotton.

[0013] The fireproof fabric can be formed with elasticised weft threads 11, whilst the warp threads can also be non-elasticised fireproof threads (not shown in the figure). The warp threads are preferably made of 100% fireproofed cotton.

[0014] According to an embodiment of the invention, the weft constitutes a reduction equal to 14.6 weft/cm, whilst the warp is equal to 32 threads/cm.

[0015] The elasticised warp threads have titre equal to 63.7 Tex and twist equal to 516 (Z).

[0016] The non-elasticised warp threads have titre equal to 62.5 Tex and twist equal to 531 (Z).

[0017] The fabric is advantageously fireproofed.

[0018] The elasticised threads are made by initially providing two webs of fibres that have been previously carded, combed and stretched, in a material that is suitable for being fireproofed. Between the two webs the elastic fibre is thus inserted, after which the yarn is twisted, using a known spinning machine.

[0019] During the spinning step the elastic fibre, which advantageously comprises a single Elastan filament, remains completely wrapped in the fibres that are suitable for being fireproofed (which are preferably cotton). The elasticised thread is thus formed into a single garment with a single yarn made from a single sliver into which two cotton webs are inserted in the middle of which the continuous Elastan thread is inserted.

[0020] The elasticised threads that are thus obtained are used for manufacturing the weft of the fabric, whilst the warp threads are made of 100% cotton.

[0021] Once weaving according to *per se* known techniques has been completed, the fabric is fireproofed.

[0022] Fireproofing is effective in cotton fibres that form the external enclosure of the weft threads. These fireproof fibres completely cover the elastic fibre, preventing the elastic fibre coming into contact with flames or metals molten through welding, and thus enabling a satisfactory fireproof effect to be achieved so as to meet European standards EN 531 A, B1, C1 and EN 470-1.

[0023] At the same time, the elastic fibre in the fabric gives the garment a certain degree of elasticity.

[0024] At this point it becomes clear how the objects of the present invention are achieved.

[0025] In particular, a fireproof fabric is provided that, owing to the elasticity thereof, is satisfactorily comfortable for the operator.

[0026] Further, owing to the particular solution in the formation of the fabric with the elastic part hidden in the cotton fibres, it has been possible to obtain the necessary level of fireproof protection in accordance with the corresponding regulations.

[0027] Naturally, the above disclosure of an embodi-

ment applying the innovative principles of the present invention is given only by way of example of such innovative principles and must not therefore be taken to limit the protective scope of what is claimed herein.

Claims

1. Fireproof fabric comprising elasticised threads (11) each one of which is made with elastic fibre (13) completely wrapped by fireproofed fibres (12). 10
2. Fabric according to claim 1, **characterised in that** said elasticised threads (11) form the weft threads of the fabric. 15
3. Fabric according to claim 1, **characterised in that** the warp threads of the fabric are non-elasticised fireproof threads. 20
4. Fabric according to claim 1, **characterised in that** the fireproofed fibres (12) are cotton fibres. 25
5. Fabric according to claim 1, **characterised in that** the elastic fibre (13) is Elastan. 30
6. Fabric according to claim 1, **characterised in that** the elastic fibre (13) comprises a single elastic filament for each elasticised thread (11). 35
7. Fabric according to claim 1, **characterised in that** the fireproof elasticised threads (11) comprise 0.5% to 10% elastic fibre (13). 40
8. Fabric according to claim 7, **characterised in that** the fireproof elasticised threads (11) comprise approximately 3% elastic fibre (13). 45
9. Fabric according to claim 8, **characterised in that** the fireproof elasticised threads (11) comprise approximately 97% cotton (12), that wraps the elastic fibre. 50
10. Fabric according to claim 1, **characterised in that** the warp threads are 100% cotton. 55
11. Work garment manufactured by using the fireproof fabric according to any one of claims 1 to 10.
12. Method for the manufacture of elasticised fireproof fabrics, comprising the steps of:
 - manufacturing elasticised threads; each comprising elastic fibre (13) wrapped completely by external fibres (12) suitable for being treated to be made fireproof,
 - weaving a fabric by using at least partially said elasticised threads (11),

- treating the fabric thereby obtained to fireproof said external fibres (12).

13. Method according to claim 12, **characterised in that** the elasticised threads (11) are used for manufacturing the weft of the fabric.
14. Method according to claim 12, **characterised in that** the warp threads of the fabric are made with non-elasticised threads.
15. Method according to claim 12, **characterised in that** the treatment for fireproofing the fabric fireproof comprises a soaking treatment.
16. Method according to claim 12, **characterised in that** after weaving the fabric is fireproofed.
17. Method according to claim 12, wherein the step of manufacturing elasticised threads comprises the step of depositing an elasticised continuous fibre between two webs of fibre that are suitable for being fireproofed after being previously carded, combed and stretched, by then twisting the yarn with the elastic fibre that is completely wrapped in the fibres that are suitable for being fireproofed.

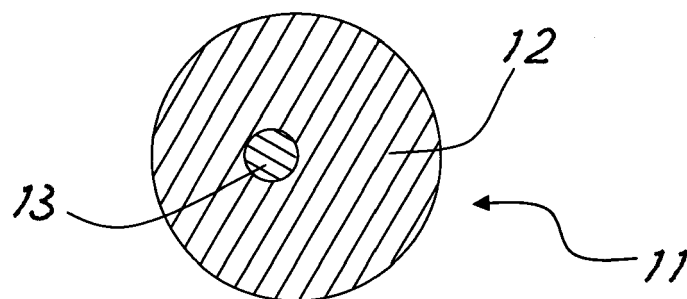


Fig.1