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(54) Cylinder for grinding and brushing machines

(57) Cylinder (10) able to be used in textile machines (20, 200) suitable to perform grinding or brushing operations or similar treatments on fabrics (14). The cylinder (10) comprises a cylindrical core (16) made of metal material, an intermediate jacket (18) made of non-metal material and an outer lining made of abrasive or filamentary material (19).

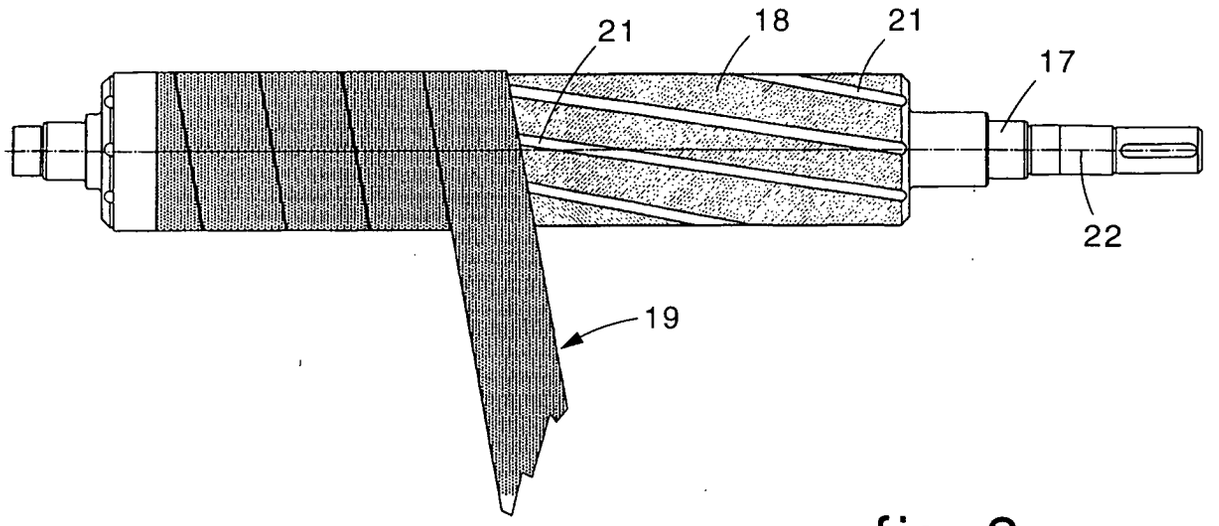

fig. 3

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Description

FIELD OF THE INVENTION

[0001] The invention concerns a cylinder able to be used in textile machines suitable to perform grinding or brushing operations or similar treatments on fabrics.

[0002] The cylinder according to the invention is able to be lined with abrasive and/or filamentary material suitable to exert a desired treatment of surface finishing on a fabric passing through in contact with its outer surface.

[0003] The cylinder according to the invention is also provided with, or associated with, at least a shaft around which it can be made to rotate idly or driven.

[0004] Said cylinder is characterized in that it has an inner cylindrical core made of metal, an intermediate jacket made of rubber material and provided with surface grooves, and an outer lining with abrasive characteristics.

BACKGROUND OF THE INVENTION

[0005] In the field of textile finishing, there are known grinding machines or brushing machines comprising a plurality of cylinders or rollers in contact with which the fabric to be treated is made to pass.

[0006] Such cylinders generally have a metal jacket lined with abrasive or filamentary material suitable to generate the desired surface treatment on the fabric passing through.

[0007] Such cylinders can be driven or idle, and can be arranged in line or mounted on the circumference on a rotary drum around which the fabric to be treated is made to pass. Examples of machines of this type can be found in EP-A-620.307, WO-A-99/01602 and EP-A-1.072.713, the last two in the name of the present Applicant.

[0008] Conventional cylinders have the serious disadvantage that they overheat while the machine is functioning, since the heat deriving from the friction between the abrasive material and the fabric passing through causes a rapid heating of the metal on which the abrasive material is wound. This entails that the functioning of the machine often has to interrupted, in order to allow the cylinders to cool, since if the abrasive material overheats, it causes irregularities and lack of uniformity of treatment on the face of the fabric in contact therewith.

[0009] Cooling systems, for example using air or water, associated with said cylinders entail high costs and complexity in both construction and management.

[0010] Another disadvantage is created by the reduced adhesion between the abrasive material and the metal, which causes premature detachment and loosening, which oblige the machine operators to perform frequent maintenance operations.

[0011] A further disadvantage of traditional cylinders is that they have a reduced capacity to absorb impacts deriving from the passage of the fabric.

[0012] The present Applicant has devised and embodied this invention to overcome all these shortcomings, and to obtain other advantages as set forth hereafter.

SUMMARY OF THE INVENTION

[0013] The invention is set forth and characterized in the main claim, while the dependent claims describe other innovative characteristics of the invention.

[0014] The purpose of the invention is to achieve a cylinder for machines intended for the surface finishing treatments of textile material, wherein the problems of overheating of the surface of the cylinders are drastically reduced, and therefore also the connected lack of homogeneity and regularity in the treatment.

[0015] In the present description, the term machine should be intended in the widest possible meaning; in fact, the machine can even be simply a single cylinder, associated with means to move a fabric into at least partial contact with its outer surface.

[0016] Another purpose is to achieve a cylinder for textile machines which guarantees a high adhesion of the abrasive lining and a good capacity of absorbing impacts during the passage of the fabric.

[0017] In accordance with such purposes, a cylinder for textile grinding or brushing machines comprises a cylindrical nucleus or core made of metal material, an intermediate jacket made of non-metal material, and an outer lining made of abrasive or filamentary material.

[0018] Advantageously the intermediate jacket is made of vulcanized rubber, bakelite, ebonite or similar.

[0019] In a preferential embodiment, said intermediate jacket is provided with surface grooves which affect a substantial part of its outer surface on which the abrasive lining is applied.

[0020] The function of said grooves is to dissipate and expel the heat generated due to the friction between the abrasive or filamentary lining and the fabric passing through, creating preferential tracks for the discharge of the heat towards the outside and transit passages for the air.

[0021] Another function of said grooves is to create an interruption in the surface on which the abrasive/filamentary material rests, generating, during the rotation of the cylinder, zones of discontinuity suitable to exert on the contact face of the fabric passing through a beating effect which improves the action of grinding/brushing.

[0022] In a first embodiment, said grooves are longitudinal and parallel to the axis of the cylinder.

[0023] According to a variant, said grooves are parallel to each other and angled with respect to the axis of the cylinder.

[0024] In another variant, said grooves are arranged in one or more spirals along the surface of the cylinder.

[0025] In yet another variant, said grooves are arranged parallel to each other and lie on a plane substan-

tially orthogonal to the axis of the cylinder.

[0026] The presence of the non-metallic intermediate jacket, between the metal and the abrasive or filamentary lining, guarantees a better reciprocal adhesion deriving from the greater friction. Therefore, a stable coupling condition is created which lasts in time and ensures the possibility of using the machine for a long time in conditions of efficiency.

[0027] The rubber covered surface also ensures a greater capacity of absorbing impacts during the passage of the fabric and hence a more homogeneous action of grinding/brushing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] These and other characteristics of the invention will be apparent from the following description of a preferential form of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

Figs. 1 and 2	show two possible examples of grinding or brushing machines wherein the cylinder according to the invention is applied;
Fig. 3	shows a view of the cylinder according to the invention;
Figs. 4 and 5	show respectively a longitudinal section and an enlarged transverse section of the cylinder according to the invention.

DETAILED DESCRIPTION OF PREFERENTIAL EMBODIMENT

[0029] In the attached Figures, Fig. 1 shows schematically an example of a grinding machine 20 of the type with a rotary drum 11 on the periphery of which a plurality of grinding cylinders 10 is mounted, also rotary.

[0030] At inlet to and outlet from the drum 11 there are drawing rollers, respectively 12 and 13, the function of which is to feed the fabric 14 which is to be treated to the grinding machine 20, maintaining a desired winding tension.

[0031] The machine 200 shown in Fig. 2, instead, has a plurality of grinding cylinders 10 arranged substantially aligned on a plane, on which cylinders 10 a fabric 14 is made to pass, tensioning rollers 15 being present and able to create a desired contact pressure between the fabric 14 and the cylinders 10.

[0032] These examples of machines 20 and 200 are not to be considered restrictive, since the cylinder 10 according to the invention can be applied substantially to every kind of machine suitable to perform finishing processes on fabrics 14.

[0033] A cylinder 10 according to the invention, able to be used in the machines 20 and 200 of Figs. 1 and 2, or in other types of similar or comparable machines, is shown in a view in Fig. 3, in longitudinal section in Fig. 4 and in enlarged transverse section in Fig. 5. Said cylinder 10 comprises an inner cylindrical metal core 16, which can be coupled with a shaft 17 to make it rotate, an intermediate jacket 18 made of rubber material, and an outer lining 19 made of abrasive or filamentary material, suitable to achieve the desired surface treatment of the fabric 14.

[0034] In the embodiment shown in Fig. 3, said outer lining 19 consists of an abrasive paper which is wound with a spiral development and has a desired pitch with respect to the longitudinal axis 22 of the relative cylinder 10.

[0035] In this case, the intermediate jacket 18 is provided, on its outer surface in contact with the abrasive lining 19, with a plurality of grooves 21 which, in the case shown here, are arranged in the direction of the length of the cylinder 10 but inclined with respect to its longitudinal axis 22.

[0036] Said grooves 21 are able to create a self-cooling action on the surface of the cylinder 10, creating preferential tracks to discharge the heat generated by the friction between the abrasive lining 19 and the fabric 14 passing through. Said grooves 21 also allow the air to pass along the whole surface of the cylinder 10 while the machine 20, 200 is functioning.

[0037] Said grooves 21, which in this case are arranged equidistant to each other on the circumference of the relative cylinder 10, also cause zones of discontinuity of the surface on which the abrasive lining 19 rests (Fig. 5) which, during the rotation of the cylinder 10, creates a beating effect on the fabric 14 passing through. This beating effect causes a more effective and deeper abrasion and/or brushing action on the touch of the fabric 14.

[0038] The grooves 21 shown in Fig. 5 are substantially circular in shape, but it is clear that they can have any shape whatsoever, even polygonal, provided they are open on the outer surface of the intermediate jacket 18. Said grooves 21 can also have any development, longitudinal, transverse or inclined, with respect to the longitudinal axis 22 of the cylinder 10.

[0039] Using a grooved intermediate jacket 18 made of rubber material between the metal core 16 and the abrasive lining 19 also ensures that the lining 19 has a very high capacity of adhesion, and reduces to a minimum the risks of any detachment and loosening during use. Said intermediate jacket 18 also gives a high capacity to absorb impacts deriving from the passage of the fabric 14.

[0040] It is clear however that modifications and/or additions of parts can be made to the cylinder 10 for grinding and brushing machines as described heretofore, without departing from the field and scope of the present invention.

Claims

1. Cylinder able to be used in textile machines (20, 200) suitable to perform grinding or brushing operations or similar treatments on fabrics (14), **characterized in that** it comprises a cylindrical core (16) made of metal material, an intermediate jacket (18) made of non-metal material and an outer lining made of abrasive or filamentary material (19).

2. Cylinder as in claim 1, **characterized in that** said intermediate jacket (18) is made of vulcanized rubber, bakelite, ebonite or similar.

3. Cylinder as in claim 1 or 2, **characterized in that** said intermediate jacket (18) comprises a cylindrical surface on which said outer lining (19) is applied and is provided with surface grooves (21) which affect a substantial part of said cylindrical surface.

4. Cylinder as in claim 3, **characterized in that** said grooves (21) are longitudinal and parallel to the longitudinal axis (22) of the cylinder (10).

5. Cylinder as in claim 3, **characterized in that** said grooves (21) are parallel to each other and angled with respect to the longitudinal axis (22) of the cylinder (10).

6. Cylinder as in claim 3, **characterized in that** said grooves (21) are arranged in one or more spirals along said cylindrical surface of said intermediate jacket (18).

7. Cylinder as in claim 3, **characterized in that** said grooves (21) are arranged parallel to each other and lie on a plane substantially orthogonal to the longitudinal axis (22) of the cylinder (10).

8. Cylinder as in claim 3, **characterized in that** said grooves (21) are substantially circular in section.

9. Cylinder as in claim 3, **characterized in that** said grooves (21) are substantially polygonal in section.

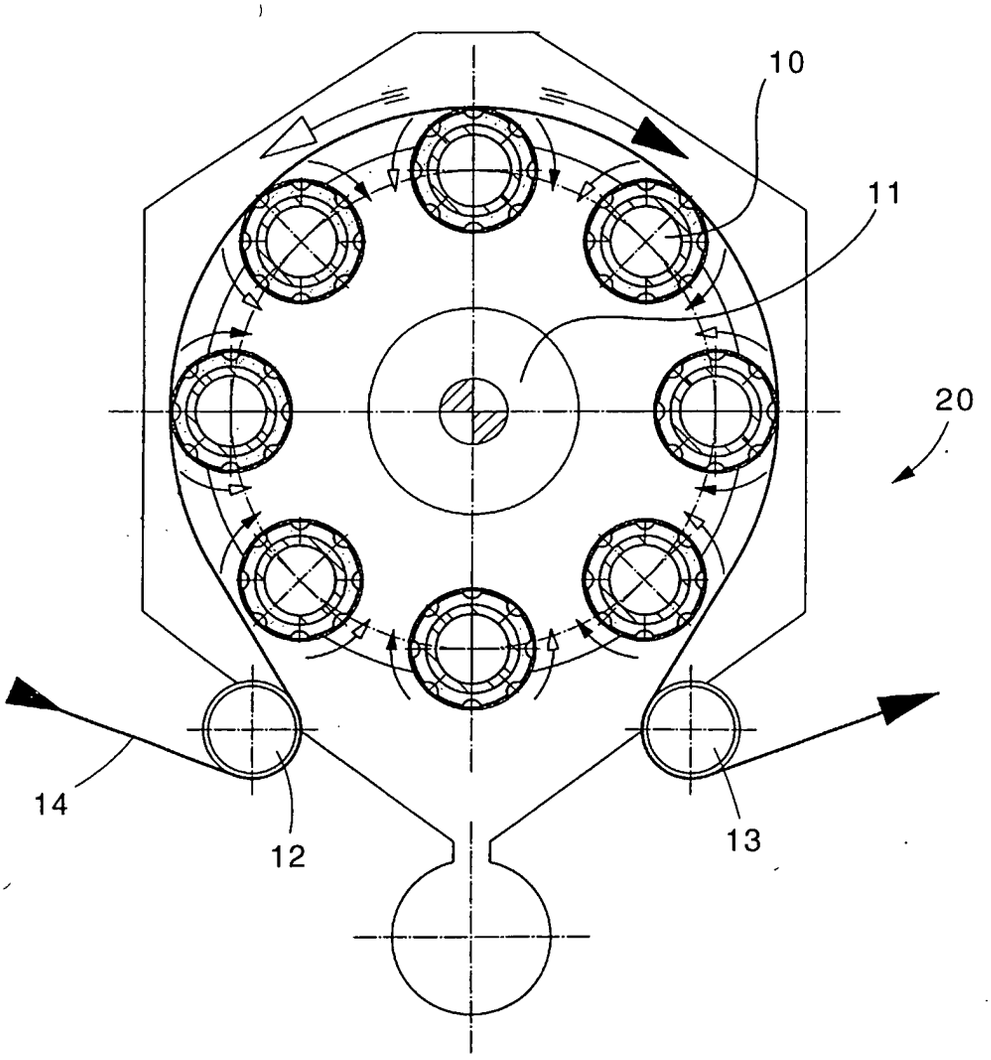

fig. 1

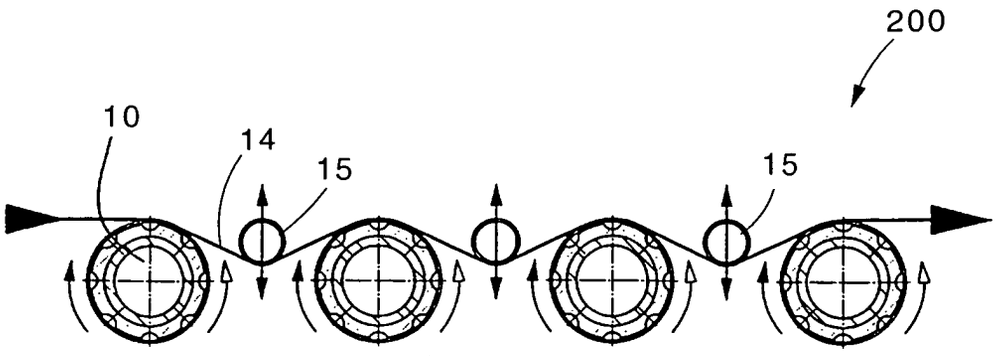

fig. 2

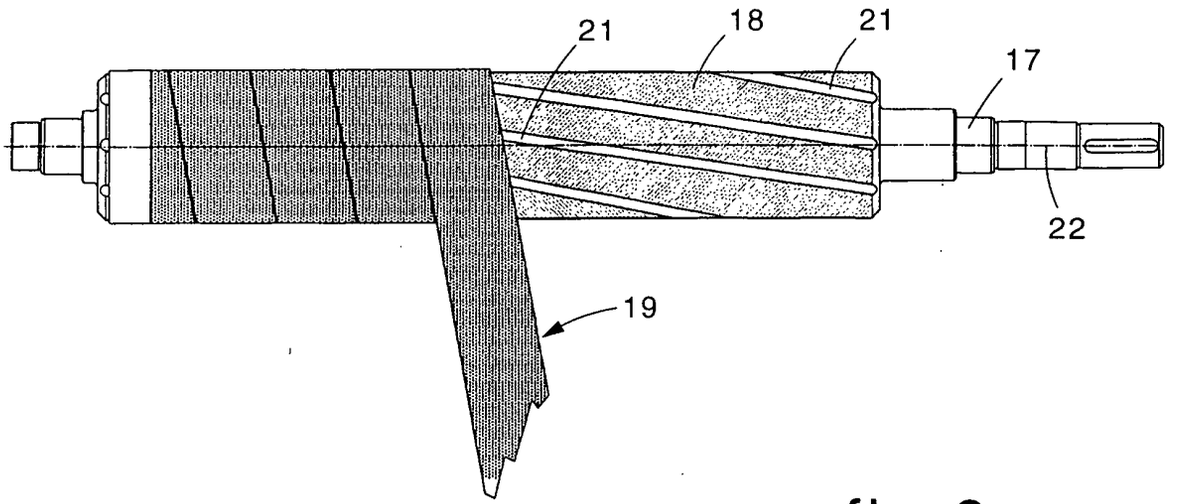

fig. 3

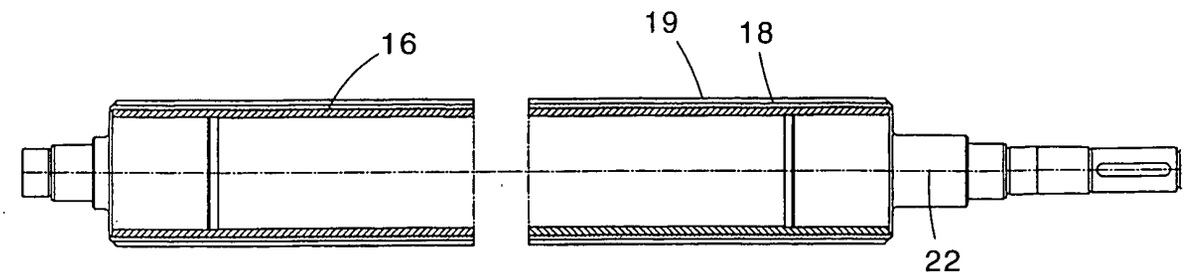

fig. 4

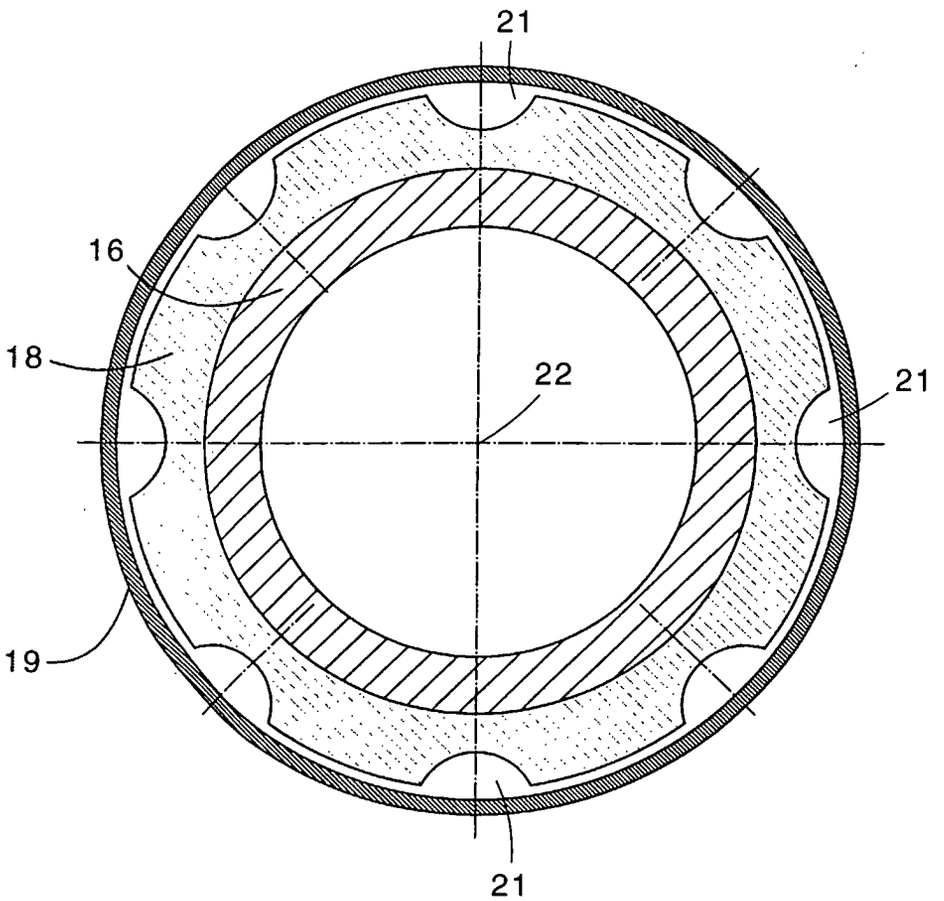

fig. 5