June 29, 1943. A. VARGA 2,323,167

TREATMENT OF WEBS OR FLEECES PRODUCED ON CARDING ENGINES

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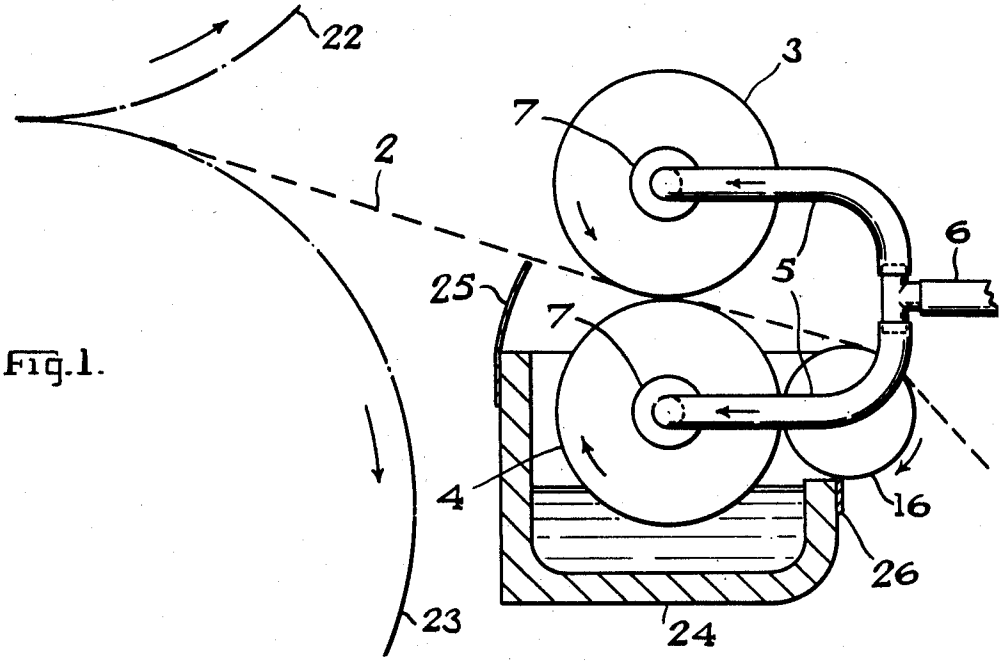

Fig. 1.

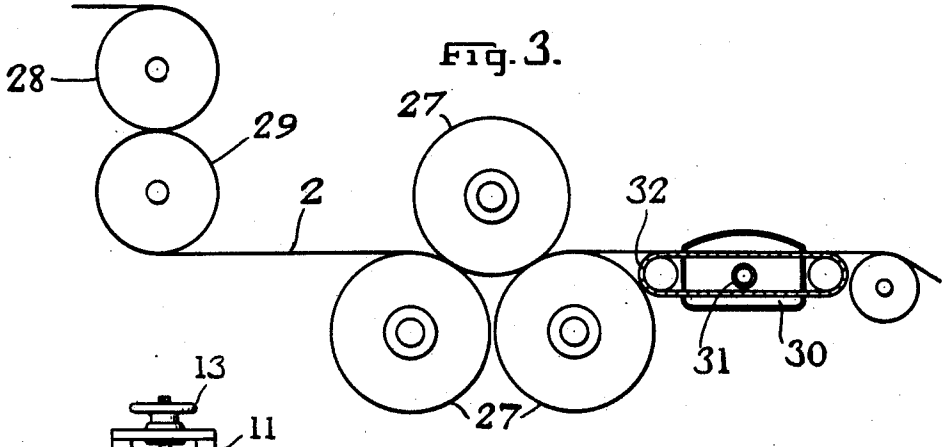

Fig. 3.

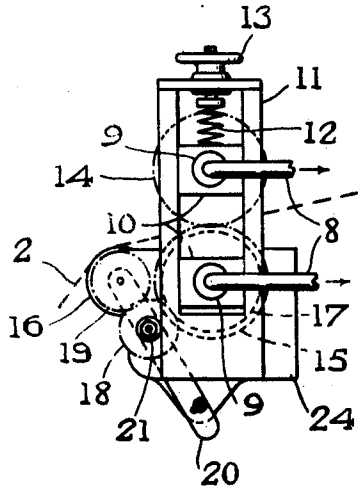

Fig. 2.

Inventor:
Andor Varga,
by Pierce & Scheffler,
Attorneys.

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TREATMENT OF WEBS OR FLEECES PRODUCED ON CARDING ENGINES

Andor Varga, Ilkley, near Leeds, England

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5 Claims. (Cl. 19—66)

This invention relates to the treatment of the textile fibre webs or fleeces produced on carding engines in an effort to discharge static electricity from or about such webs or fleeces (all of which are hereinafter included in the term "webs") and to increase the spinning properties of the fibres. The invention is especially suitable for combination with treatment for crushing foreign substances or bodies from the webs by pressure rollers or cylinders.

It has been found that under certain dry atmospheric conditions there is a tendency for the presence of static electricity about the fibre web, which has a detrimental effect on the carding operation, such as causing the thin web to adhere to metal, wood or other parts of the machines used, and the individual fibres to repel each other and obstruct proper slubbing being formed.

The object of the present invention is to discharge static electricity from or about a web and to increase the spinning properties of the fibres generally.

A further object includes the method of treating the textile fibre webs produced on a carding engine so as to increase their spinning properties, consisting in submitting the webs to heat of a given temperature.

Referring now to the accompanying drawing in which two embodiments of the invention are shown by way of example only:

Fig. 1 is a side elevation of apparatus for providing a heat and moisture treatment;

Fig. 2 is a side elevation on a reduced scale of the driving gears of the apparatus;

Fig. 3 is a diagrammatic side view of modified apparatus for treating webs or fleeces.

In the embodiment of this invention shown in Figs. 1 and 2 the fibre web 2 passing from one of the doffing cylinders of the carding engine is led to and between a pair (or pairs) of rollers or cylinders 3, 4, which are heated to a desired temperature. Preferably the surface speed of the rollers is the same as that of the doffing cylinder of the carding engine. Any convenient method of heating the rollers 3, 4, may be employed and that shown comprises flexible steam pipes 5 passing from the feed pipe 6 to the hollow stub axles 7 with exhaust pipes 8 passing from the opposite stub axles 9. The rollers are arranged in bearings 10 mounted in the supporting framework 11 and the pressure of the roller 3 is controlled through the springs 12 and hand device 13. Only a light pressure may be applied to the web that passes between the rollers, or the pressure may be sufficient to crush any foreign bodies mixed in the fibres. The said pressure may be applied mechanically as shown, or the rollers 3, 4, may be set or adjusted and pressure applied by the heat causing expansion of the rollers.

By submitting the web to heat treatment in the above manner, the oil impregnating the textile fibres is caused to more uniformly permeate and/or surround such fibres, due to the fact that any tendency of the oil to become viscous or slightly solidified is counteracted by the heating operation. It will be seen that for this purpose the temperature requires to be regulated to a degree which suits working conditions, the web and the type of oil in use and causes the above permeation and distribution. The rollers 3, 4, are geared together by gear wheels 14, 15 and one is driven from any convenient motive source. The web passes away over a guide roller 16 which is driven from the lower axle 9 through gear wheels 17, 18 and 19. The two latter wheels are carried by a lever 20 pivoted at 21 to allow the adjustment of the guide roller 16 to and away from the roller 4. The rollers 4 and 16 also serve to support the web 2.

As the fibres are spread by the carding operation, a relatively large surface is presented by the web to the surrounding air whereby the tendency for the drying out of the moisture in the fibres, the presence of which is necessary for efficient work, is increased. Furthermore, when it is desired to cause a crushing of impurities in the web by rollers or cylinders, such as the rollers 3, 4 or those indicated at 22, 23, this necessitates the production of a still thinner web which in addition causes greater exposure to the air, whereby still more moisture is lost. Moreover the loss of moisture tends further to create static electricity which will already be present under certain atmospheric conditions. Also when crushing rollers are used the great pressure and close contact of the crushing rollers produces a further excess of static electricity. To discharge this electricity from the web and make it more or less non-electrical on its further passage, a vaporized moisture treatment is applied which also serves to replace the lost moisture and further facilitate the treatment of the fibre web. The vapourized moisture i. e. water treated to create moist vapour or moist steam is introduced to the web at any desired point or points preferably, but not necessarily, at a stage where the web is uniformly and thinly spread out. For example, with the above heated

rollers 3, 4, moist vapour or steam may be introduced before and/or after such rollers according to the nature of the textile fibres being treated. A convenient arrangement is shown in Figs. 1 and 2 wherein the heated lower roller 4 is mounted in a water trough 24 so that steam or moist vapour is released adjacent to the web supporting roller 4 and will rise from the water surface to impregnate the web and create a conductive path. A shield 25 concentrates the vapour before the rollers 3, 4, and a cleaning device 26 is provided for the guide roller 16. The position of the device 26 may be adjusted for the guide roller 16. The position of the latter may be adjusted to control the amount of vapour rising past it to the web.

When this invention is combined with a crushing operation then, and particularly in worsted or other carding when the web is excessively wet, it is preferred to facilitate the natural drying out of the web 2 before passing between the crushing rollers because dry impurities are crushed more efficiently than moist ones. It is also preferred to apply moist vapour or steam after the said fibres have been submitted to the heat treatment and crushing operation. Therefore as shown in Fig. 3, in a particular construction employing three crushing rollers 27 for the treatment of textile fibres used in worsted or similar industries, the fibre web is led partially around one heated roller 28 before being led between it and a further heated roller 29 from whence it passes to the crushing rollers 27. The number of heated rollers may be increased or diminished if desired. The moist vapour or steam treatment shown takes place in a chamber 30 (a partially enclosed area or the like may be used) so that the moist vapour or steam cannot readily pass away to metal parts which may become rusted or be otherwise affected by the action of the moist vapour or steam. Steam is introduced to the chamber 30 through a perforated steam pipe 31, although it may be introduced in some other manner, which is shown in Fig. 3 lying within an endless lattice 32 which supports the web so that the steam is released within the web-supporting means. Water could be heated in the chamber so that steam or moist vapour will rise evenly to the web 2, or the heated rollers 3, 4 and trough 24 may be used. The steam treatment may include an unenclosed steam pipe, a perforated roller or other device over, or in close proximity to, which the web 2 is led, with a suitable cover or other member to retain the steam.

The moist vapour or steam treatment for woollen or worsted carding tends to neutralise any static electricity which has a tendency to form under certain conditions due to the carding operation. Static electricity is particularly liable to form during dry spells, and has a detrimental effect on the carding operation due to it causing the textile fibres to stick to metal, wood or other parts, and also its tendency to counteract the actual carding operation. It will be seen that the moist vapour or steam will not only moisten the fibres and so have a beneficial effect on the web in the course of the further carding and spinning process, but will also moisten the surrounding air in a manner to render it capable of conducting static electricity. Therefore, it only requires the moist vapour or steam to be of a density sufficient to form a continuous conductive path between the web and convenient earthing means for discharging static electricity. For example, any static electricity will tend to pass through the moistened air to the rollers 3, 4 and/or steam pipe and through to earth or by a special earthing arrangement associated with the said conductive path.

It will readily be understood that if the temperature of the pressure rollers is increased well above the temperature of the surrounding air, then the physical properties of the fibres will be changed and, as the fibres are lying in one layer and coming into contact with a heated surface, each fibre will become ironed and consequently lustrous and thus allow new effects to be produced in yarn and cloth. Furthermore, such rollers may be engraved or embossed and so increase the variety of effects which could be produced from such textile fibres.

What I claim is:

1. A method of treating the thin textile fibre webs produced on a carding engine, consisting in submitting a web to a crushing operation and then to a moist vapour treatment so as to moisten the web fibres and the surrounding air, and ensuring that the density of said vapour renders the latter capable of forming a continuous conductive path between the web and a convenient earthing means for discharging static electricity from or about the web as well as increasing its spinning properties.

2. The method of treating textile fibre webs produced on a carding engine according to claim 1, consisting in submitting a web to moist steam.

3. The method according to claim 1, wherein the vapour is released within or adjacent to web supporting means.

4. In the method of treating textile webs produced on a carding engine according to claim 1, the additional step consisting in subjecting the web to a drying operation before the crushing operation.

5. The method according to claim 1, wherein the web is submitted to a heating and drying operation before the crushing operation.

ANDOR VARGA.