July 21, 1959 A. BOER 2,895,857

PROCESS FOR CLEANING WOOL IN DRY STATE

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Fig. 1

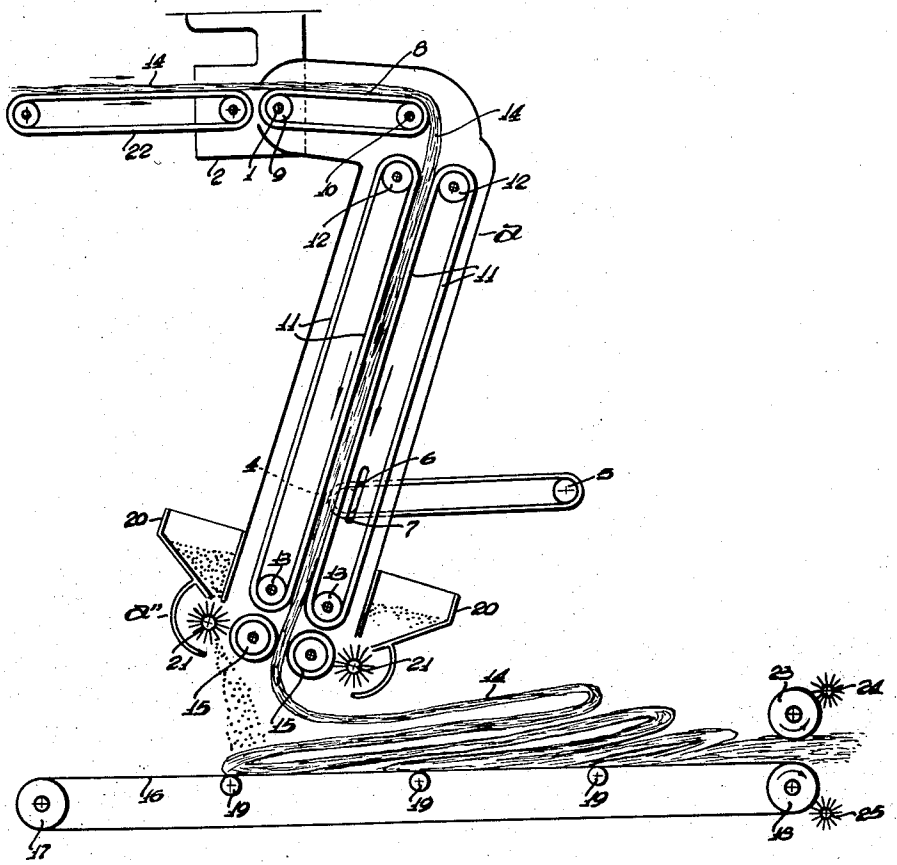

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Fig. 2

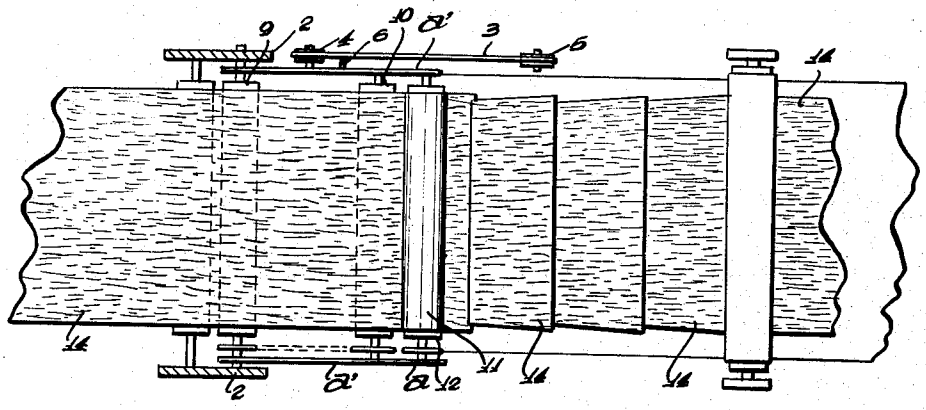
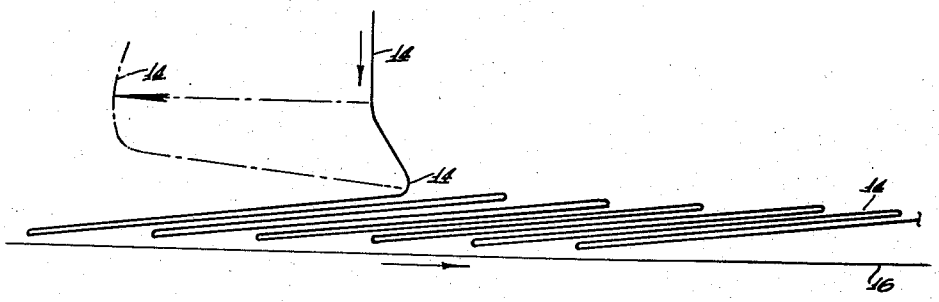


Fig. 3



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PROCESS FOR CLEANING WOOL IN DRY STATE

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6 Claims. (Cl. 134—7)

The present invention refers to a process for cleaning wool in dry condition, and more particularly to a system for incorporating detergent powder, which, by the fibre folding process which is a characteristic of this machine, constitutes an improvement of great importance in the modern type of cleansing, offering so many advantages over the classical damp washing.

The method consists in treating the wool with a powder avid of grease, in such a manner that it is able to extract all the grease or wax which may be contained in its fibres after these having been conveniently carded, with the particularity that the incorporation of the powder to the wool is done in a special manner on a bidimensional base, resulting in the powdering by layers.

In this case the wool, after passing through a card, which defibers it in a convenient manner, is carried by means of conveyors to an oscillating folder which, in turn, acts upon another conveyor, in such a manner that at the same time that the material is projected, it is being pleated in plan form into successive layers resulting from the movement of said conveyor. Since the folding apparatus has a receptacle where the detergent power is loaded, as each successive layer is folded, it is powdered individually, resulting in an even distribution on both sides of each layer.

Consequently, when frictioning with rollers or by other means to obtain the removal of grease and other foreign substances, a relatively short cycle is necessary, as the powder is intimately in contact with the fibres during the whole run, owing to the formation of layers. This means that after a short run with friction rollers or other means able to rub the active detergent element into the fibres, the process ends with the extraction of the powder by suction or percussion means, leaving the wool practically in conditions to pass to the textile process, that is to say, that if it is perfectly defibered, a veil may be obtained from it for spinning purposes.

For a greater clearness and comprehension of the object of this invention it has been illustrated with several drawings, showing the machine, as well as the powdering means, in which:

Fig. 1 shows a schematic view of the folding machine, the oscillating head of which, whilst shaping the material deposits it in length on a conveyor, effecting the powdering operation at the same time.

Fig. 2 is a view of the machine shown in Fig. 1 clearly demonstrating the manner in which the folds are superposed in zig-zag manner, and finally

Fig. 3 is a view of the formation which the material takes after being deposited in zig-zag layers.

In the different drawings the same reference number indicates equal or corresponding parts, the various components being indicated by letters.

As may be seen in the drawings, *a* is the folder which on a chassis *a'* is joined with the articulation axis **1** on the bearing **2**, in the manner shown in Fig. 1. The folder is oscillating according to the control of a conveyor belt

3 which, acting between wheels **4** and **5** is coupled to any power transmitting source.

The conveyor belt **3** possesses a bolt **6** which is in the same track with the swivel **7** of the chassis *a'*; said swivel is of a length equivalent to the diameter of the wheels **4** and **5** so that when chain **3** circulates, the bolt **6** running on a plane and displacing chassis *a'* angularly from the position of full lines to that of dotted lines and vice versa, passes to an immediate plane in order to effect the angular run in an opposed sense, which means that chassis *a'* moves angularly in accordance with the run of bolt **6** in the top and lower section of the chain.

The folder *a* possesses in its upper part a conveyor belt which, between rollers **9** and **10** circulates in order to deliver the woolen material to the pair of belts **11** which, symmetrically and parallelly circulate from rollers **12** to the lower roller **13**. Said belts **11** are set in such a near manner, as shown in Fig. 1 that, when receiving the woolen material **14**, they send them in a descending manner to head *a''*. Said head *a''* has a pair of rollers **15** situated below the pair of belts **11** so that said rollers **15** are those which allow the outlet of the woolen material **14** in order to place same on a conveyor **16** which is in circulating disposition with rollers **17** and **18**, apart from possessing sustaining rollers **19**.

The head *a''* apart from the outlet rollers **15**, possesses a pair of boxes **20** in which is loaded the detergent powder which is to be strewn on the woolen material **14** when same is deposited on conveyor. These boxes **20** have an outlet in the lower part, where the brushes **21** are also set, regulating the flow of powder for its distribution. The detergent powder may be any suitable or known absorbent material such as that of U.S. Patent No. 1,824,105 or No. 2,194,773.

The belt **8** received the material **14** from the conveyor **22**, which may be material placed at the outlet of any opening or defibering card, capable of producing said in continuous form.

Roller **18** of the conveyor **16** is accompanied by another roller **23** which in play with roller **18** acts as a calender in order to press and rub the wool with the powder. Roller **23** has a cleaning brush **24** matching the cleansing brush **25** which, opposite to roller **18**, acts on the surface of the conveyor belt **16**.

With these means, the process is carried out in the following manner: the woollen material to be cleaned, previously carded, is dirty, and is carried by conveyor **22** to belt **8** of the folder *a* which oscillates angularly as shown in Fig. 1.

The woollen material **14** runs between the pair of belts **11** in descendant manner so as to emerge through rollers **15** of the head *a''*.

Since the folder *a* oscillates angularly, whilst the conveyor **16** circulates in the direction indicated by the arrows, the material **14**, when deposited on conveyor **16** takes a plan shape in zig-zag, but in layers owing to the advance movement produced by conveyor **16**, as graphically shown in Fig. 3.

As at the same time the powder deposited in boxes **20** is strewn, regulated by brushes **21**, a powdering is obtained on the pleated layers of the material **14**, so that, evenly distributed, the powder is incorporated to the wool; thus, when passing through the rubbing rollers, the friction of the powder with the wool is obtained in order to extract the grease or wax which is absorbed by said powder which is avid of grease.

This means that the folded wool is prepared with the incorporation of the detergent powder in such a manner that, by posterior friction, it may be easily treated through the action of said powder in a friction contact.

Undoubtedly when carrying out this invention, modi-

fication may be introduced in what refers to certain details of construction and form of the device described, without this implying a departure from the fundamental principles which are clearly specified in the following claims.

I claim:

1. A process for cleaning carded wool in the dry state which comprises forming a length of such wool into a succession of overlapping zig-zag folds, discharging a grease-avid detergent powder on to the folds as they are formed, subjecting the folded wool and powder to frictional contact until the detergent powder has absorbed the grease from the wool, and then removing the detergent powder with its absorbed grease from the wool to leave the wool in cleaned condition.

2. A process according to claim 1, in which the folds are produced by passing the length of wool in a downward direction while subjecting the same to oscillatory movement, and depositing it on a moving conveyor belt.

3. A process according to claim 2, in which the detergent powder is discharged on to the wool as it is being folded at the end of its downward, oscillatory movement.

4. A process according to claim 2, in which the frictional contact of the detergent powder with the wool is effected at the end of the movement of the folded wool on the moving conveyor belt on which it has been deposited.

5. A process for dry cleaning carded wool which comprises forming a belt-shaped fleece of such wool, moving this fleece downward and simultaneously oscillating it angularly, depositing this fleece on a flat conveyor so that in each angular displacement there is formed on said conveyor a zig-zag fold of the fleece, causing said conveyor to advance so that the zig-zag folds of said fleece are deposited in stepped formation, dusting said wool fleece with detergent powder as it is being folded in stepped zig-zag formation so that the powder is applied on both sides of the folds which are formed, and rubbing the wool with the powder so that the latter absorbs the grease and leaves the treated fibers clean.

6. A process for dry cleaning carded wool which comprises forming a belt-shaped fleece of such wool, moving this fleece downward and at the same time oscillating it angularly pendulum-fashion, depositing said fleece on a flat conveyor so that in each angular displacement there is formed on said conveyor a zig-zag fold of the fleece, causing said conveyor to advance at a lower velocity than the alternate angular movement of the fleece so that the zig-zag folds of said fleece are deposited in stepped formation, dusting by means of the mechanical action of a brush detergent powder on said wool fleece on both sides thereof so that the powder is applied in all the folds which are formed, and rubbing the wool with the powder so that the latter absorbs the grease and leaves the treated fibers clean.

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