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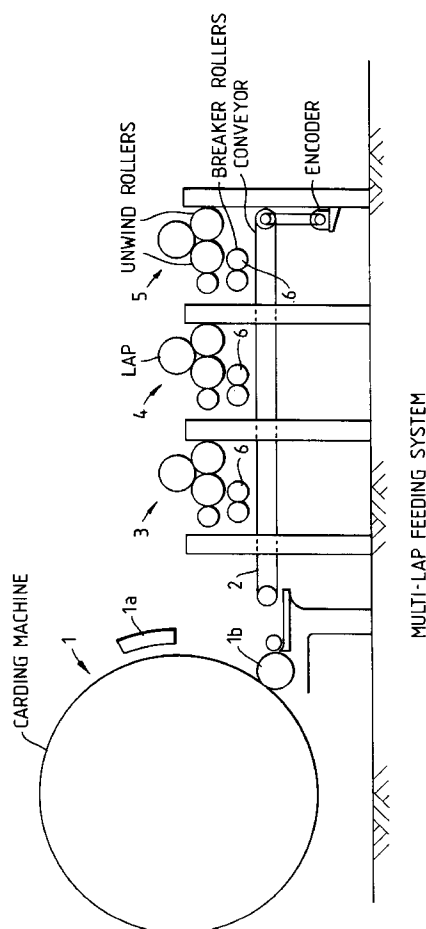
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Production of multi-coloured cotton wool products.

A method of forming cotton wool articles, e.g. cotton wool balls, pleats or pads, comprises forming the articles from a web derived from a carding machine (1) the input to which consists of discreet lengths of coloured cotton wool lap (3,4,5) fed to the carding machine in an end-to-end sequence. The effect of the carding machine is to blur the changes in colour which occur as each successive lap is delivered to the carding machine with the result that the final product exhibits a gradual transition in colour. The resultant product is aesthetically more pleasing than prior art multi-coloured cotton wool products which exhibit sudden transitions in colour and enables multi-coloured products to be manufactured continuously on a single machine line.



This invention relates to the production of multi-coloured cotton wool products, for example cotton wool balls, cosmetic pads, and cotton wool pleats.

In order to enhance the aesthetic appeal of cotton wool/wadding products it has been common for many years, especially with cotton wool balls, to mix carded cotton balls of different colours prior to final packing in polyethylene bags. This has been done by producing cotton wool balls from separate but adjacent card lines each fed with two laps of a different colour. Typically a single card is fed with two half width laps (each about 500mm wide) from a modified scutcher. All the laps of each colour were, of course, run off together from the scutcher at the same time. Each of the two slivers from the card were fed through a ball making line so that the cotton balls fell onto a passing conveyor. In this way the finished bag of cotton wool balls contained a mixture of colours in proportion to the number of different colours on the ball lines.

More recently, to produce multi-coloured rolls and pleats, the same principle of using narrow laps this time at one third width or less, has been used on a row or range of cards to produce cotton wool rolls or pleats with three or more colours running in the longitudinal direction of the roll or pleat packet. Currently for cosmetic pads (squares or discs), where the objective is to produce different coloured cotton wool discs in polythene bags, it is the practice to pack the bags subsequent to the punch line in three separate operations. The bags are one third filled with the first colour, then put to one side until all the carded rolls of the first colour are used up. The punch line is then fed with carded laps of a second colour and the bags filled with one third of that colour and the cartons of bags put to one side. When the carded laps of the second colour are used up, the laps of the third colour are introduced and the bags filled with the final colour and passed for final packing into the shelf and/or transit cartons.

This process is obviously labour intensive because the bags have to be handled by the packing operatives three times. The process is therefore more expensive than when single colours are produced.

One objective of using different coloured cotton wool has been to produce a "rainbow" effect of different colours. However, with cosmetic pads especially, it has only been possible to produce a sudden rather than a gradual change of colour.

A primary effect of the current invention is to produce cotton wool products in which there is a gradual change of colours. In the case of cotton wool pads this will result in a pack in which there is a gradual change in colour from the first pad in a packet to the final one. In the preferred embodiment the sequence of colours and number of pads can be changed electronically, so that a very wide variation of colours and numbers can be produced.

The current invention can also produce graduat-

ed colour changes in the carded web fed to cotton wool ball or pleats and roll lines. Thus, the single packet of pleats or rolls would have graduated colour bands across the width of the wadding, which could be produced from a single card followed by a continuous lapper or layering machine. At present the longitudinal coloured bands in cotton wool rolls and pleats are produced from a range of several cards. In the case of cotton wool balls a single line would be able to produce a mixed bag of cotton wool balls some of which would have a blend of two colours.

In accordance with one aspect of the present invention laps of different colours are broken into discrete lengths, and the discrete lengths are arranged end to end for feeding to a conventional cotton carding machine.

As the carding drum of the machine rotates it blends the fibres of differing colour together. The effect of this is to blur the transition from one colour to another. By suitable choice of the parameters of the carding machine the desired blurring can be relatively quick or relatively slow, and by coordinating this characteristic with a suitable choice of lengths of lap supplied to the carding machine the desired transition from one colour to another can readily be accomplished.

The invention will be better understood from the following description of apparatus for the performance thereof, the single figure illustrating schematically an embodiment of the invention.

Referring to the drawing a carding machine 1 of substantially conventional design is fed with a continuous lap from a conveyor 2. The lap presented to the carding machine is assembled from a multiplicity of discrete lengths of lap of different colours fed onto the conveyor end-to-end from separate unwinding stations 3,4,5. Each unwinding station comprises conventional unwinding apparatus furnished with a pair of breaker rollers 6. Operation of the various components is controlled such that portions of lap from the various unwinding stations 3,4,5 are deposited on the conveyor in an end to end sequence. Preferably, the entire sequence is under program control to provide a desired and repeatable sequence of broken lap portions on the conveyor. The resultant continuous lap when applied to the carding machine 1 will be carded in a manner which blurs the transition from one colour to another.

The carding machine may have stationary flat or a roller and clearer as indicated by reference numeral 1a. As the surface of the lick-in 1b rotates clockwise at, for example, about 250m/min it draws fibres from the lap of an area weight of around 644 gsm, which is fed in at a rate around 0.55m/min. The fibres are then transferred to the wire on the cylinder running at a much greater surface speed, e.g. around 500m/min. Where the card has stationary flats, the fibres are carded between the wire on the flats and that on the

cylinder. In roller and clearer cards which give better blending, the fibre is transferred from the cylinder then to the roller, then to the clearer and back onto the card. Since not all the fibre is processed in one revolution of the cylinder and not all fibres go round each roller and clearer, a substantial blending of fibres of different colours takes place on the cylinder. The fibre is finally removed from the cylinder onto the doffer (not shown) and from the doffer by roller or reciprocating comb. The final web speed is typically about 25m/min and at an area weight of 13-15 gsm.

In addition to the blending of different colours that takes place on the cylinder, cross, continuous or drum lappers can be used to give further variation in the mixing or blending of coloured fibres. In this way different blending patterns and mixing effects can be obtained.

The carded fibres removed from the carding machine can then be applied to conventional forming machinery, for example a cotton wool ball forming machine, or lapping or layering machines for producing pleats or other cotton wool products.

It will be appreciated that the number of unwinding stations provided can be varied in accordance with the range of colour combinations required in the finished product.

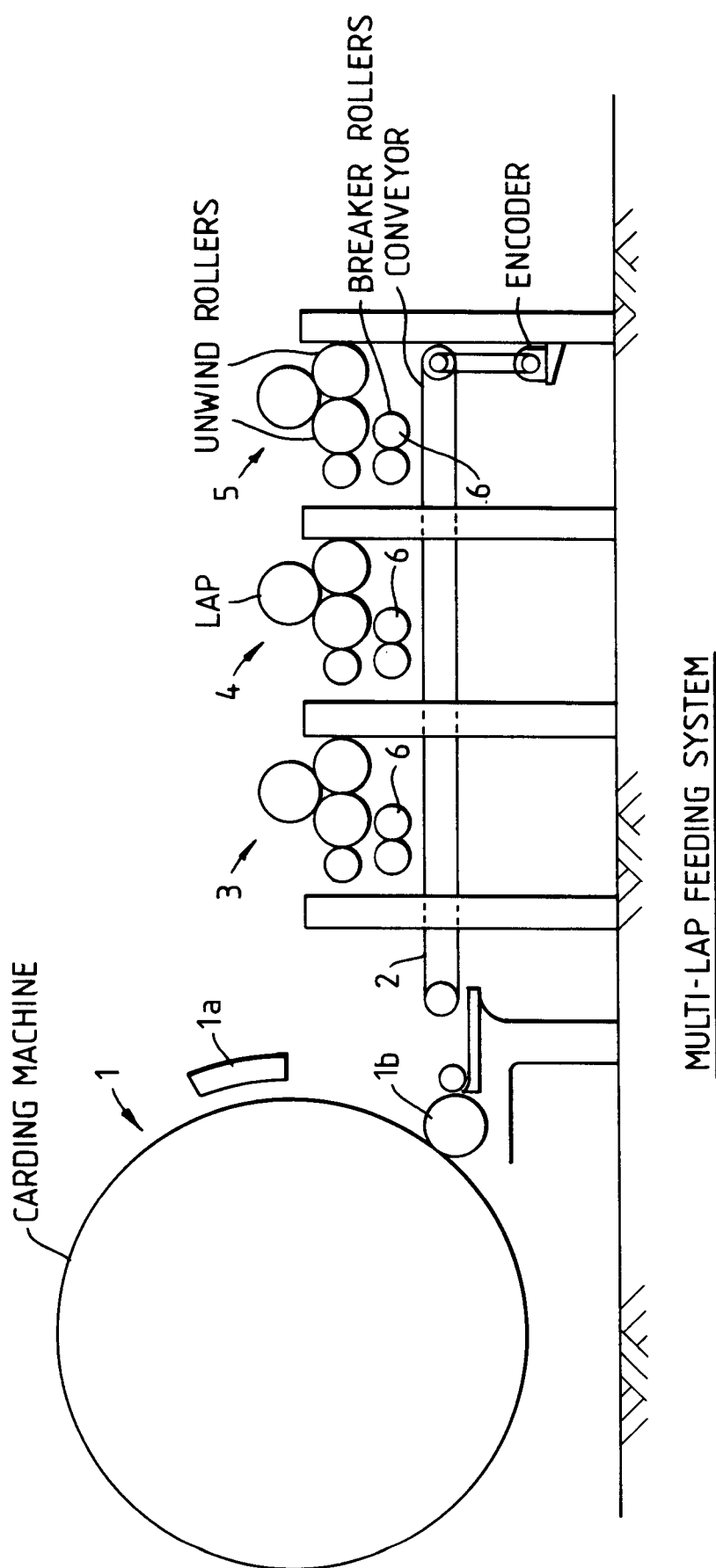
The above described embodiment of the invention not only eliminates the problem of sudden changes of colour as outlined above, but enables improved production since the carding machine and post-carding formation apparatus may be run continuously thereby reducing the labour normally associated with the intermittent changing of colour to produce the desired mixed colours in the final product.

Claims

1. A method of producing articles of cotton wool comprising feeding discreet lengths of cotton wool lap of different colours arranged in an end-to-end relationship to a carding machine; carding the laps to produce a web of carded fibres in which the transition from one colour to the next is blurred; and forming the articles from the web.
2. A method according to claim 1 wherein the laps are derived from a multiplicity of separate unwinding stations and are arranged in the required end-to-end relationship of a common conveyor extending from said unwinding stations to the carding machine.
3. The method of claim 1 or claim 2 wherein the assembly of the discreet lengths of lap is under program control.
4. The method according to claim 3 wherein the pro-

gram control produces a repeatable sequence of lap portions for feeding to the carding machine.

5. A method according to any preceding claim wherein the web produced by the carding machine is treating by a lapping or layering machine prior to formation of the articles in order to produce further variations in the mixing or blending of the coloured fibres.
6. A method according to any preceding claim wherein the carding machine comprises a carding cylinder and a licker-in and wherein the peripheral speed of the carding cylinder is substantially higher than the peripheral speed of the licker-in.
7. A method according to claim 6 wherein the peripheral speed of the carding cylinder is approximately twice the peripheral speed of the licker-in.
8. A method according to claim 7 wherein the peripheral speed of the carding cylinder is approximately 500m/min.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 3557

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	DE-A-19 37 826 (MULSANT ET CIE) * the whole document *	1	D01G15/42 D01G37/00
Y		2	
A		5	
Y	US-A-3 443 286 (GROCE,H.W.) * column 3, line 14 - line 50; claim 1; figures 1,5 *	2	
A	US-A-2 851 849 (MERRILL,R.D.) * column 3, line 2 - column 4, line 24; figures 1,2,6 *	1	
A	US-A-2 992 458 (WITSCHI,F.)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			D01G
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 2 August 1994	Examiner Munzer, E
CATEGORY OF CITED DOCUMENTS		I : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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