

UNITED STATES PATENT OFFICE.

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PROCESS FOR TREATING CRAPE WASTE.

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Among the waste materials sold under the trade name of silk floss one species which is of far lower value than the average is the waste produced in spinning and weaving crape yarn.

This loss of value may be explained by the fact that crape yarn, which is characterized by the powerful torsion imparted to the original silk thread, produces waste threads which cannot be combed for conversion into chappe. In fact, the characteristic torsion of the crape yarn prevents the fibres of this yarn from separating under the action of the comb, the yarn remaining curly and whole, so that all treatment by combing and spinning, with the object of obtaining a chappe yarn, is rendered impossible.

The present invention relates to a process of treating crape waste to enable the same to be afterwards combed or carded and finally the production of a chappe yarn from such waste, the said process being based on the following observations:

If crape threads, the extremities of which are free, be subjected to the action of a carding or combing machine, the friction of the needles of the carding or combing machine sets up incipient untwisting of the crape threads, but only to a very slight extent and quite insufficient to liberate the fibres of which the thread is composed. If short crape threads with free extremities are exposed to the action of boiling water, the threads will untwist and thus revert to their primitive condition. If the ends of the crape threads are not free, the action of the boiling water is similar, but since the solidity of the extremities prevents the threads from untwisting, they will remain twisted and assume a peculiar aspect known as "crape". If the threads treated with boiling water are free at the extremities, but are too long, untwisting is rendered impossible by the folding and tangling of the threads upon themselves, which tangling, in fact, entirely prevents the extremities from becoming free.

According to the present invention the crape waste is first passed through an opener to break up the compact masses always found in waste of this kind. This operation can be performed in well known manner by any suitable means known in the art such as with the so-called waste-opening machines. At the same time that it breaks up the masses of waste, the opener breaks up the long threads present in the waste. The type of the open-

ing machine selected and the manner of working the same exert a considerable influence on the length of the individual threads obtained after treatment. These two factors allow the length of the thread elements obtained to be regulated approximately.

After passing through the opener, the waste is put through a machine for the purpose of completely separating the threads and arranging them in parallel lines. This parallelism of the threads can be effected either by means of the clothing of the carding machine or the needles of the comb. The carder and comb may also be employed in succession, or vice versa, or the waste may be treated in the various carding machines constituting a set. Though the choice of the machine and the method of working it may be varied the result to be obtained by the treatment will always be the same, namely that the threads of which the waste is composed are obtained as a sliver or ribbon, completely separated and lying parallel to each other. As already mentioned above, this carding process effects an incipient untwisting of such of the threads as are free at the ends; but in all cases it breaks the threads to some extent, especially the longest. In carding ordinary textile fibres, the aim is to minimize this breaking of the fibres, by effecting the operation in a gradual and progressive manner, the breaking of the fibres being increased by carding in a rough manner. By so proceeding in carding crape waste to produce conditions for breaking up the long threads, the waste can be brought into such a condition that the fragments are short enough to enable them to be untwisted by the boiling process.

It may happen that the threads resulting from the two preceding operations are still too long to untwist satisfactorily by boiling in which case the length of these threads can be shortened to any desired extent by cutting up the sliver or ribbon into equal sections by means of cutters, or shears, of any suitable kind. The crape threads of which the sliver or ribbon are composed are thus separated into portions the maximum length of which corresponds to the length of the cut sections, and the extremities of these portions will be free, by reason of the previously effected parallelism of the threads. A good length to give these portions is about 4 centimetres, but this may vary and may be appreciably exceeded. This method of operating permits

obtaining crape threads in portions which are not unduly long as well as shorter lengths of thread. The sliver or ribbon may be cut into equal lengths prior to carding, by operating, for example, on the sliver produced by an opener of the "Garnett" type. The operations may also be performed in the following order: opening, carding, cutting, carding. The production of crape threads, sufficiently short, slightly untwisted and completely separated from each other, is therefore the result aimed at in the three preceding operations of opening, carding and (if necessary) cutting, the said operations being combined in such a way as to furnish threads of approximately uniform length and with a minimum of waste.

The shortened fragments of crape threads having begun to untwist in the course of the preceding operations and being completely separated from each other, are then treated with boiling water, which operation should preferably be carried out with the following precautions.

(a) The portions of crape threads must not be introduced or kept in boiling water in a compact mass, but in a divided state, so that the untwisting of the threads may not be impeded by their compact condition but, on the contrary, be facilitated by their agitation during the boiling process.

(b) While the boiling water scours the filaments of the silk, and thus assists the untwisting of the crape threads, the action is assisted by adding a little soap to the water. If the operation has been properly performed, the untwisting of the threads, after 30 to 40 minutes boiling, will have advanced sufficiently to allow the waste to be taken out, rinsed and dried.

The untwisted crape threads no longer present the appearance of yarn, the untwisting having liberated the silk fibres of which they are composed. When dry, these fibres form a slightly matted mass of white waste, which must be carded in order to separate the fibres from each other. The resulting product is a somewhat short-staple chappe, which is suitable for undergoing all the operations of carding or combing, drawing and spinning. This chappe may be mixed with any other textile fibres, such as wool, in order to produce a mixed yarn.

It will be understood that the process is applicable to wool crape waste, whose value is small for the same reason as the silk waste, as well as to all other waste crape threads, of whatever material they may consist.

What I claim is:—

1. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, immersing said waste material in boiling water, drying said

waste material and subsequently recarding said waste material for the purpose set forth.

2. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, cutting said lengths into short fragments, carding said waste material, immersing said waste material in boiling water, drying said waste material and subsequently recarding said waste material for the purpose set forth.

3. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, cutting said lengths into short fragments, immersing said waste material in boiling water, drying said waste material and subsequently recarding said waste material for the purpose set forth.

4. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, cutting said lengths into short fragments, carding the short fragments, immersing said waste material in boiling water, drying said waste material and subsequently recarding said waste material for the purpose set forth.

5. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, immersing said waste material in a solution of boiling water and soap, drying said waste material and subsequently recarding said waste material for the purpose set forth.

6. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, cutting said lengths into short fragments, carding said waste material, immersing said waste material in a solution of boiling water and soap, drying said waste material and subsequently recarding said waste material for the purpose set forth.

7. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, cutting said lengths into short fragments, immersing said waste material in a solution of boiling water and soap, drying said waste material and subsequently recarding said waste material for the purpose set forth.

8. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, cutting

said lengths into short fragments, carding the short fragments, immersing said waste material in a solution of boiling water and soap, drying said waste material and subsequently recarding said waste material for the purpose set forth.

9. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, immersing said waste material in boiling water for a period of from 30 to 40 minutes, drying said waste material and subsequently recarding said waste material for the purpose set forth.

10. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, cutting said lengths into short fragments, carding said waste material, immersing said waste material in boiling water for a period of from 30 to 40 minutes, drying said waste material and subsequently recarding said waste material for the purpose set forth.

11. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, cutting said lengths into short fragments, immersing said waste material in boiling water for a period of from 30 to 40 minutes, drying said waste material and subsequently recarding said waste material for the purpose set forth.

12. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, cutting said lengths into short fragments, carding the short fragments, immersing said waste material in boiling water for a period of from 30 to 40 minutes, drying said waste material and subsequently recarding said waste material for the purpose set forth.

13. A process for treating crape waste ma-

terial which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, immersing said waste material in a solution of boiling water and soap for a period of from 30 to 40 minutes, drying said waste material and subsequently recarding said waste material for the purpose set forth.

14. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, cutting said lengths into short fragments, carding said waste material, immersing said waste material in a solution of boiling water and soap for a period of from 30 to 40 minutes, drying said waste material and subsequently recarding said waste material for the purpose set forth.

15. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, cutting said lengths into short fragments, immersing said waste material in a solution of boiling water and soap for a period of from 30 to 40 minutes, drying said waste material and subsequently recarding said waste material for the purpose set forth.

16. A process for treating crape waste material which comprises running said waste through a waste opening machine to break up the threads into substantially equal lengths, carding said waste material, cutting said lengths into short fragments, carding the short fragments, immersing said waste material in a solution of boiling water and soap for a period of from 30 to 40 minutes, drying said waste material and subsequently recarding said waste material for the purpose set forth.

In testimony whereof I have signed this specification.

GEORGES BONNARD.