Aug. 19, 1958 J. JERVIS 2,847,717

INDUSTRIAL APPARATUS AND METHOD

Filed March 9, 1956

FIG. 1.

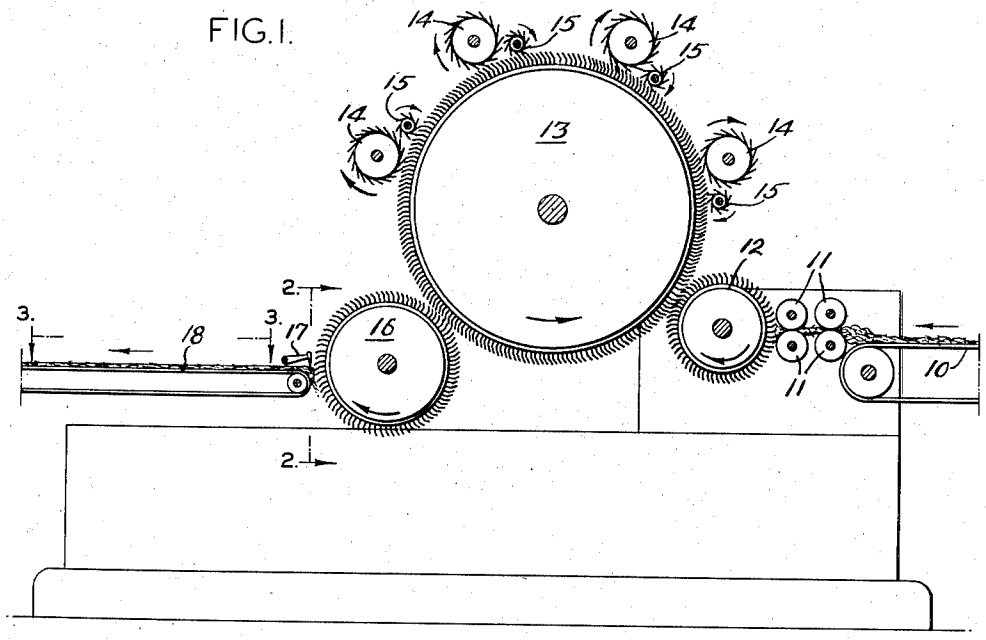


FIG. 2.

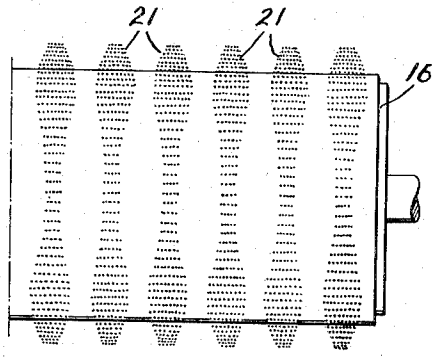


FIG. 3.

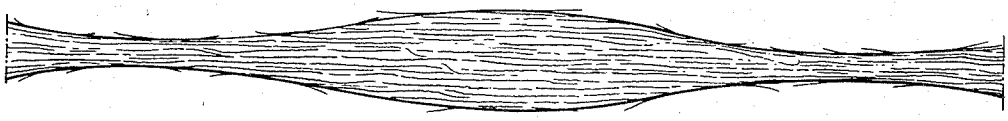
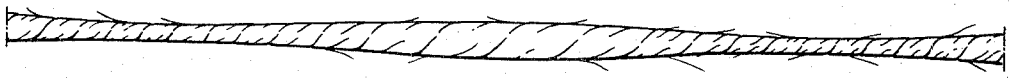


FIG. 4



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INDUSTRIAL APPARATUS AND METHOD

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2 Claims. (Cl. 19—106)

The present invention relates to an apparatus and method for producing yarn having a varying weight per unit length along its length.

It has been found desirable, especially in the manufacture of carpets, to employ a yarn in which the weight varies along its length. The varying weight per unit length in the pile yarn of a carpet provides an improved blending of the pile surface which eliminates stripes and other directional effects in the pile. The conventional way to form irregular yarns of this character is to introduce slubs or nubs during the spinning or twisting operation. To accomplish this, it is necessary to include special attachments which unduly increase the expense of operation of the spinning or twisting machines.

The present invention provides a method and apparatus for producing irregular yarns on conventional spinning and twisting machines.

More specifically, the invention contemplates the substitution of a novel doffer for the conventional doffer of a carding machine which thereby delivers a yarn sliver having a varying weight per unit length.

All of the objects of the present invention and the various features and details of the construction and operation thereof are more fully set forth hereinafter with reference to the accompanying drawing in which:

Fig. 1 is a schematic elevation of a carding machine embodying a doffer made in accordance with the present invention;

Fig. 2 is a fragmentary elevation of a novel doffer made in accordance with the present invention, as seen on the line 2—2 of Fig. 1;

Fig. 3 is a plan of the sliver delivered by the doffer as viewed on the line 3—3 of Fig. 1; and,

Fig. 4 is a plan of the yarn spun from the sliver shown in Fig. 3.

The present invention provides a novel doffer for a card which strips from the main cylinder of the card a plurality of slivers. The construction of the doffer provides slivers in which the width varies along the length while the thickness remains constant. The varying width of the sliver doffed from the main cylinder provides a varying weight per unit length in the sliver. When the sliver is spun into yarn, the wider portions of the doffer provide thicker portions in the yarn which give the appearance and produce effects similar to nub or slub yarns. Furthermore, the yarn produced by the spinning of the sliver varies in twist by reason of its varying thickness.

Referring now to the drawing, the present invention provides a doffer which may be employed on a conventional carding machine. With reference to Fig. 1, the conventional carding machine is shown as comprising a feed apron 10 for delivering a loose web to the feed rolls 11, 11 of the carding machine. The feed rolls 11 advance the fibrous material to a lickerin 12 which in turn deposits the fibers on the main cylinder 13 of the carding machine. The fibrous material is successively carded at carding stations about the periphery of the main cylinder, each carding station consisting of a worker 14 and a stripper 15. The carded web on the main cylinder is removed by a doffer 16, as described more fully hereinafter, in the form of a plurality of slivers of varying weight per unit length. The slivers are stripped from the doffer by a doffer comb 17 and deposited on a conveyor 18 which carries the sliver to a neb motion which imparts a false twist to the sliver which is then wound on pack spools prior to spinning.

In accordance with the invention, the doffer strips the slivers from the card cylinder which vary in weight per unit length. To this end, the doffer 16 is clothed with bands of clothing 21 which are axially spaced, and which vary in the axial dimension around the periphery of the doffer. It is noted that the radial dimension of the bands 21 of clothing is uniform about the periphery so that the clearance between the doffer and the main cylinder is constant. Thus, the thickness and quality of the sliver does not vary, as would be the case where there is a varying clearance between the doffer and the main cylinder. The clothing 21 of the doffer is formed similarly to the conventional doffer clothing, but is provided with a varying axial dimension. Thus, the sliver stripped from the main cylinder by the doffer is of varying width as shown in Fig. 3.

In the subsequent spinning operation, the sliver of varying weight per unit length is spun into yarn, for example as shown in Fig. 4, and the resulting yarn has a similar variation in weight per unit length. Thus, the yarn is provided with thick and thin portions. In addition, by reason of the nature of the spinning machine, the twist of the yarn varies inversely to its thickness, whereby the thick portions of the yarn have a lower twist than the thin portions.

It is preferred to form the strips of doffer clothing 21 with sinusoidal variations in width, but is also possible to form the strips 21 with other configurations which will provide different variations in sliver weight per unit length, and accordingly, different variations in weight of the finished yarn. Thus, the present invention provides a novel doffer for a carding set which produces yarns of varying weight per unit length without special attachments to the spinning machines.

While a particular embodiment of the present invention has been herein illustrated and described, it is not intended to limit the invention to such disclosure, but changes and modifications may be made therein and thereto within the scope of the following claims.

I claim:

1. In apparatus for producing irregular yarn continuously varying in weight per unit length along the length thereof, a carding set including a main cylinder and a generally cylindrical doffer coextensive in length with said main cylinder, and mounted adjacent thereto, said doffer having bands of card clothing mounted circumferentially thereof, said bands being of a uniform radial dimension about the complete circumference of said doffer, and continuously varying sinusoidally in axial dimension about the circumference of the doffer.

2. For a carding set including a main cylinder, a lickerin, a plurality of workers and strippers, and a doffer, card clothing for said doffer comprising a plurality of axially spaced bands extending circumferentially of said doffer, each of said bands being of uniform radial dimension and continuously varying sinusoidally in axial dimension about the circumference of said doffer.

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