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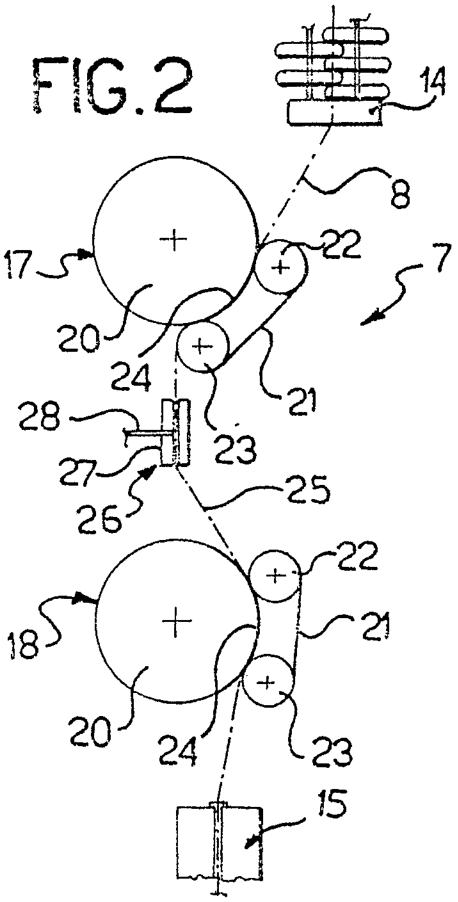
(54) A texturizing machine.

(57) A texturizing machine (1), which can yield effectively bulked yarn for a reduced power input, comprises, within a head frame (2), a yarn path (8) extending between a pay-off bobbin (9) and a take-up bobbin (10), a plurality of feeders (16,17,18,19) arranged along said path (8) and interleaved to a first oven (13), a false twist spindle (14), and a second oven (15), as well as an air-blast interlocking device (26), wherein two feeders (17,18) are set close to each other but sufficiently apart to accommodate the air-blast interlocking device (26) therebetween.

FIG.2



This invention relates to a texturizing machine of a type which comprises, within a head frame, a yarn path extending between a pay-off bobbin and a take-up bobbin, a plurality of feeders arranged along said path and interleaved to a first oven, a false twist spindle, and a second oven, as well as an air-blast interlocking device.

As is known, such a machine would act on a yarn to expand its volume by a so-called yarn bulking process mainly dependent on the effect from the false twist spindle.

The first oven, located upstream of the false twist spindle, serves the function of freeing the yarn of distortion as set in by prolonged storage in a wound state around the pay-off bobbin. The second oven, which locates downstream from the false twist spindle, is instead operative to relieve the yarn of the snap imparted to it by the false twist spindle.

It has been suggested, moreover, of equipping texturing machines with an air-blast interlocking device, through which the yarn is passed, the device acting on the yarn by a blast of pressurized air.

The air blast is effective to ruffle the yarn, thus contributing toward an increase of the yarn bulk and assisting the false twist spindle in providing a desired yarn bulkiness.

On prior texturizing machines, the air-blast interlocking device has been positioned along the yarn path either between one feeder and the take-up bobbin, or between the outlet of the second oven and said one feeder, or alternatively and preferably, between one feeder and the inlet to the second oven, which will therefore be acting on yarn previously subjected to the air blast.

Owing to the sequential and coadjuvant actions of the false twist spindle and air-blast interlocking device, such prior machines have proved advantageous in several ways, and accordingly been widely accepted for the manufacture of quality texturized yarns.

The Applicant, after investigating such machines, has come to conclude that the air requirements of the air-blast interlocking device are quite high for a given bulked yarn.

This affects the overall energy input to the machine in an unfavorable manner, and ultimately reflects in a high unit cost of the resulting yarn, which drawback has had to be accepted as a perforce matter.

The problem that underlies this invention is to provide a texturizing machine as specified above which has such construction and performance characteristics as to obviate the above-noted drawback.

Based on the observation made, and to solve the above technical problem, this invention provides a texturizing machine which is characterized in that it comprises two feeders set close together but sufficiently spaced apart to accommodate the air-blast interlocking device therebetween.

Further features and the advantages of a texturizing machine according to this invention will become apparent from the following detailed description of a preferred embodiment thereof, given by way of illustration and not of limitation with reference to the accompanying drawings, where:

Figure 1 shows schematically and in elevation a texturizing machine according to the invention;

Figure 2 is a schematic view of a detail of the machine shown in Figure 1;

Figure 3 is a side view of the detail shown in Figure 2; and

Figures 4, 5, 6, 7 and 8 are further views showing the detail of Figure 3 under different conditions of operation.

With reference to the drawing views, generally indicated at 1 is a texturizing machine according to the invention.

The texturizing machine 1 comprises a stationary head frame 2 which rests on the floor through feet collectively indicated at 3.

The head frame 2, which may have a length of some tens meters, comprises an elongate center body 4 and, arranged on a right-hand side of the latter, a right-hand side body 5, a lane 6 being left between the center body 4 and the right-hand side body 5.

The head frame 2 further comprises a left-hand side body, not shown, which is identical with the right-hand side body 5, since the texturizing machine 1 has a longitudinal plane of symmetry extending along the length of the center body 4 and whose trace is indicated at X-X.

The machine 1 comprises, arranged along its length, a plurality of texturizing stations, collectively indicated at 7, which are laid abreast at regular pitch distances along the head frame 2 in two arrays extending symmetrically about the symmetry plane having the trace X-X.

One of said texturizing stations 7 will be described herein below in detail.

In connection with the texturizing station 7, there is provided through the head frame 2 a yarn travel path, indicated at 8, which extends between a pay-off bobbin 9 and a take-up bobbin 10.

The pay-off bobbin 9 is received in a creel 11 carried on the side body 5, whereas the take-up bobbin 10 is accommodated in the center body 4 such as to bear on a powered roller 12.

Along the yarn path 8, in this order from the pay-off bobbin 9 to the take-up bobbin 10, this texturing machine includes a first oven 13 attached to the right-hand side body 5, a false twist spindle 14 mounted to the center body 4, and a second oven 15 attached to the center body 4.

Arranged along the yarn path 8 are a plurality of feeders 16, 17, 18, 19 which are all identical with one another for convenience. As an example and in accordance with a prior approach, each of said plural feeders comprises a powered roller 20 and a drive belt stretched between two pulleys 22 and 23. The roller 20 and pulleys 22, 23 are arranged such that the belt 21 will have a working run 24 pressed against the roller 16 in contact therewith.

Of the aforesaid feeders 16, 17, 18 and 19, the feeder 16 is located downstream of the pay-off bobbin 9 and upstream of the first oven 13.

The feeders 17 and 18 locate between the false twist spindle 14 and the second oven 15, and are set close to each other as appropriate to define therebetween, along the yarn path 8, a yarn path section 25 having a predetermined length.

The texturizing machine 1 includes, located along the yarn path 8 and specifically the section 25 thereof, an air-blast interlocking device, known per se, which comprises a tubular sleeve 27 mounted to the center body 4 and being fed with air from an injector 28.

Note should be taken of that the length of the section 25 would be selected to have a limited but sufficient value to allow said air-blast interlocking device 26 to fit in the space between the feeder 17 and the feeder 18.

As for the feeder 18, this is located downstream from the second oven 15 and upstream of the take-up bobbin 10.

The operation of the texturizing machine according to this invention will be described herein below with reference to Figures 1 to 3, wherein a yarn 29 is shown unwinding from the bobbin 9 and travelling the path 8 after passing in the nip between the roller 20 and the working run 24 of the drive belt 21 of the feeder 17 by which it is entrained.

The yarn is then entrained by the feeders 17 and 18, it being passed under a predetermined tension as required for interlocking through the blasted air interlocking device 26.

The yarn is then passed through the second oven 15, while being dragged along by the feeder 19 which applies a preferably gentle predetermined pull to it.

Lastly, the yarn is wound onto the take-up bobbin 10.

With reference to Figures 4 and 5, the yarn paths through two stations 7 abreast share a common interlocking device 26. In this case, two yarns 30 and 31 from two adjacent stations 7 in the abreast arrangement can be coupled together along the respective sections 25 upstream of their common air-blast interlocking device 26.

Thus, the common interlocking device 26 may be set astride the two stations (see Figure 4), and possibly offset angularly (see Figure 5).

With reference to Figures 6, 7 and 8, the yarn paths of two stations 7 abreast have in common two feeder devices 17 and 18 and one interlocking device 26. In this case, two yarns 32 and 33 can be coupled together along their respective paths 8 ahead of the section 25 and upstream of the feeder 17 of one of them.

Thus, the interlocking device 26 being utilized may be either that of one station (see Figure 6) or set astride the stations (see Figure 7) and possibly offset angularly (see Figure 8).

A major advantage of the texturing machine according to the invention is that it affords unprecedented energy savings; by virtue of the yarn path section through which the interlocking device is operative being made short, the desired bulkiness can be achieved for a reduced expenditure of pressurized air.

Another advantage is that the interlocking can be made smoother and more uniform along the yarn; it has been found, in fact, that the resulting bulkiness does not tend to unravel itself.

The additional advantage has been further ascertained in an improved effectiveness of the setting action of the second oven, thanks to the yarn being fed therethrough under gentle tension.

Finally, it has been found that the inventive texturing machine can provide satisfactory coupling of yarns from adjacent stations with each other.

Understandably, the texturing machine just described may be altered and modified by a skilled person in the art in a number of ways to meet specific contingent demands, without departing from the true scope of the invention as set forth in the appended claims.

Claims

1. A texturizing machine (1) of a type which comprises, within a head frame (2), a yarn path (8) extending between a pay-off bobbin (9) and a take-up bobbin (10), a plurality of feeders (16,17,18,19) arranged along said path (8) and interleaved to a first oven (13), a false twist spindle (14), and a second oven (15), as well as an air-blast interlocking device (26), characterized in that it comprises two feeders (17,18) set close together but sufficiently spaced apart to accommodate the air-blast interlocking device (26) therebetween.

2. A texturizing machine (1) according to Claim 1, characterized in that said feeders (17,18) embracing the air-blast interlocking device (26) are positioned between the false twist spindle (14) and the second oven (15).

3. A texturizing machine (1) of a type which

comprises, within a head frame (2), a plurality of side-by-side yarn paths (8), wherein each yarn path (8) extends between a pay-off bobbin (9) and a take-up bobbin (10), a plurality of feeders (16,17,18, 19) arranged along each yarn path (8) and interleaved to a first oven (13), a false twist spindle (14), and a second oven (15), as well as an air-blast interlocking device (26), characterized in that it comprises two feeders (17,18) set close together but sufficiently spaced apart to accommodate the air-blast interlocking device (26) therebetween, two adjacent yarn paths (8) in the side-by-side arrangement sharing an air-blast interlocking device (26) in common.

4. A texturizing machine (1) according to Claim 3, characterized in that adjacent yarn paths (8) in the side-by-side share one feeder (17,18) in common.

FIG.1

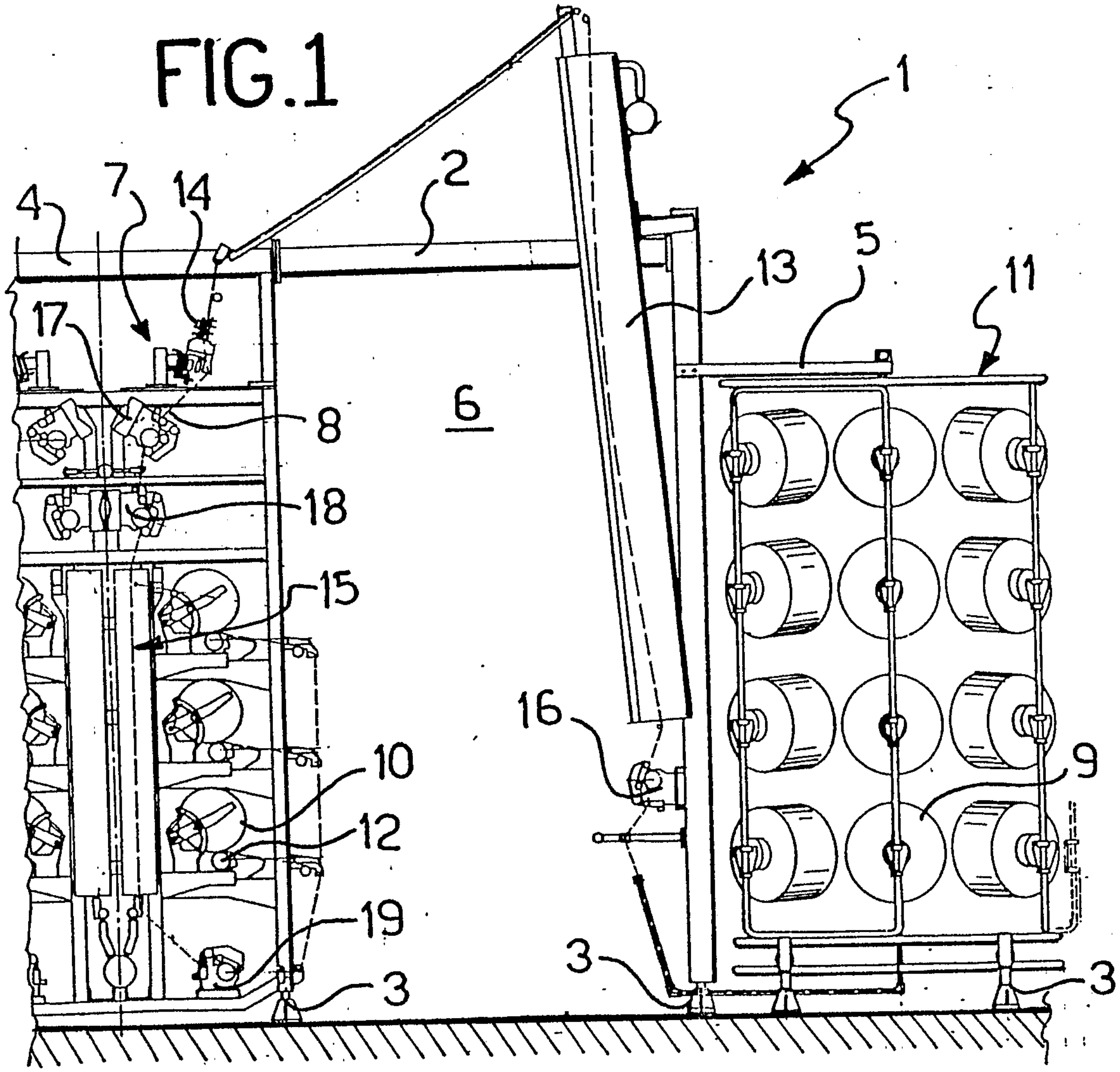

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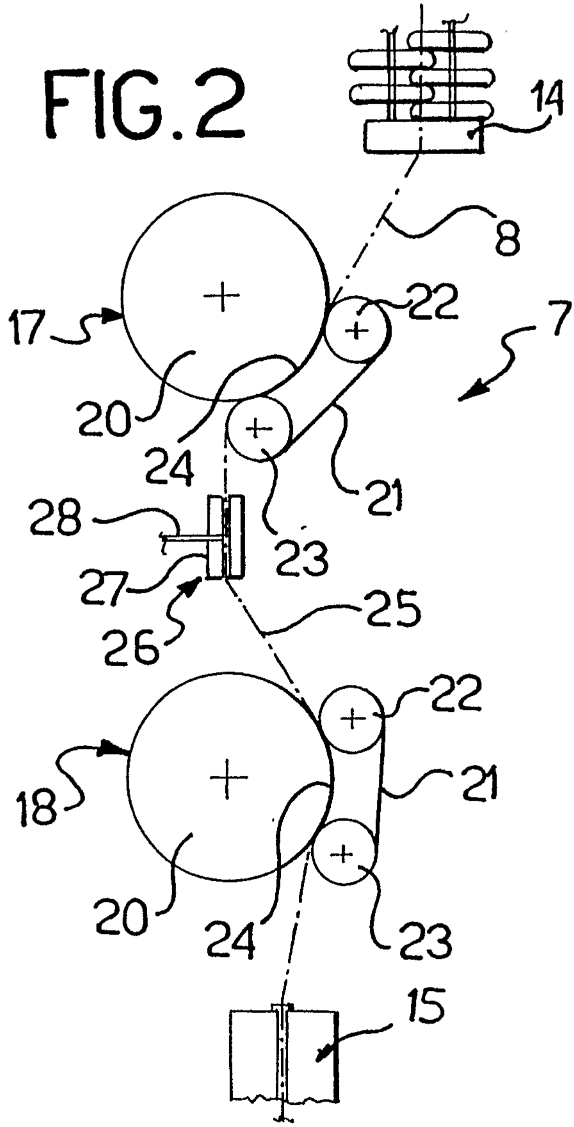
FIG.2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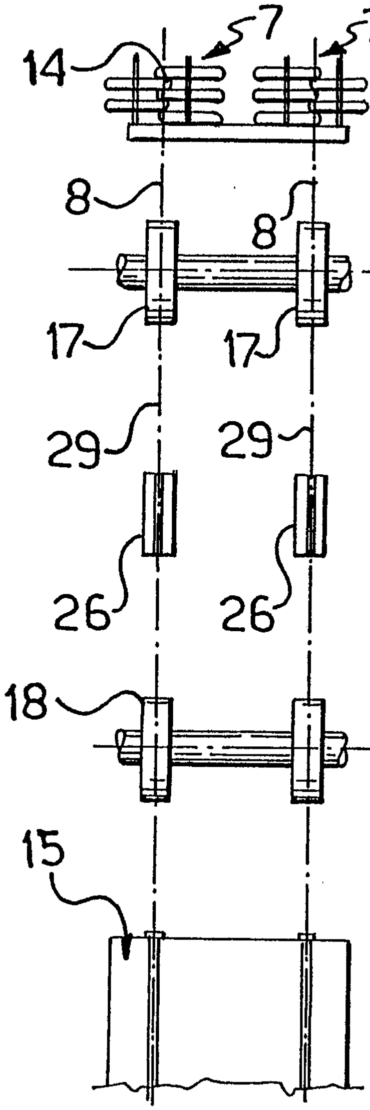

FIG.3

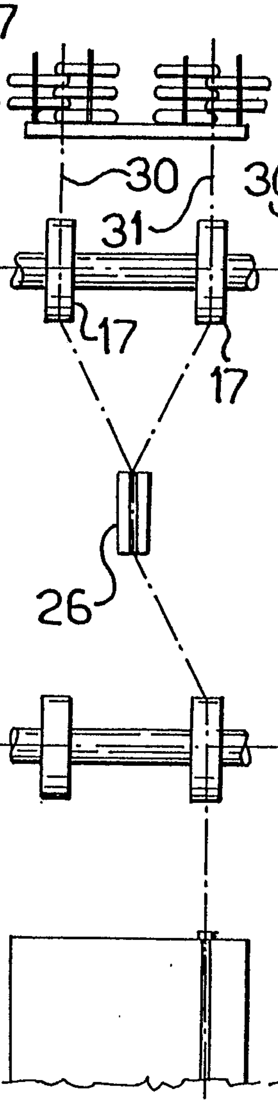

FIG.4

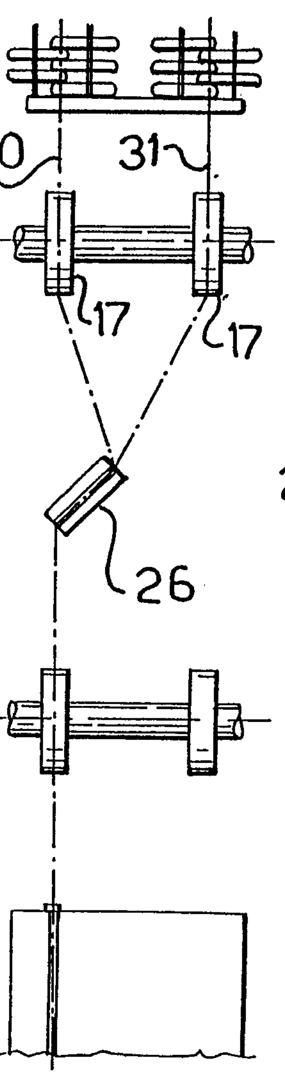

FIG.5

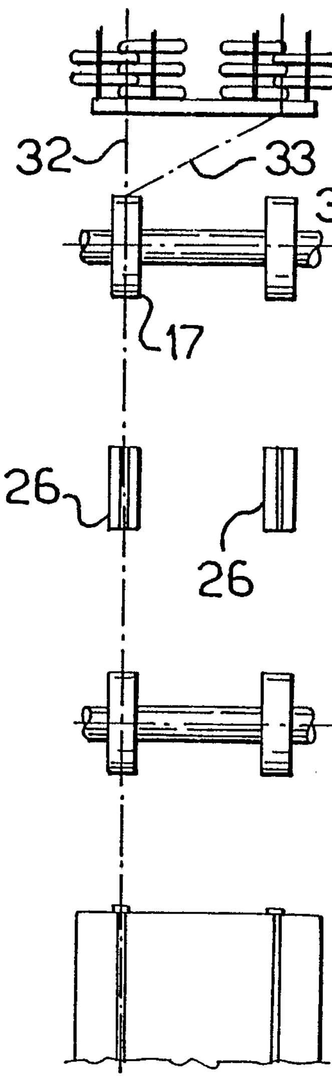

FIG.6

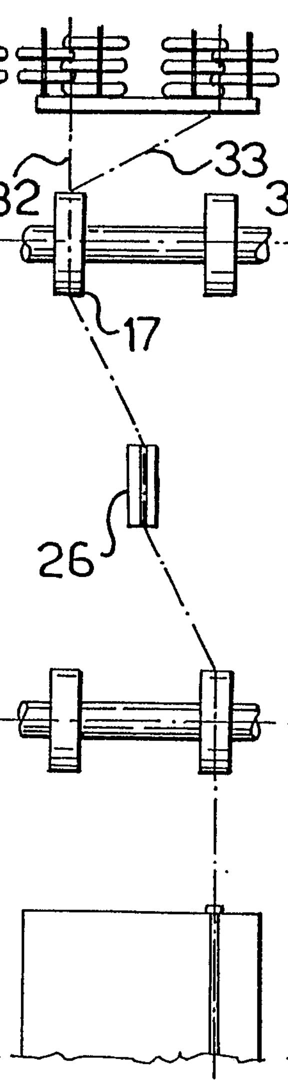

FIG.7

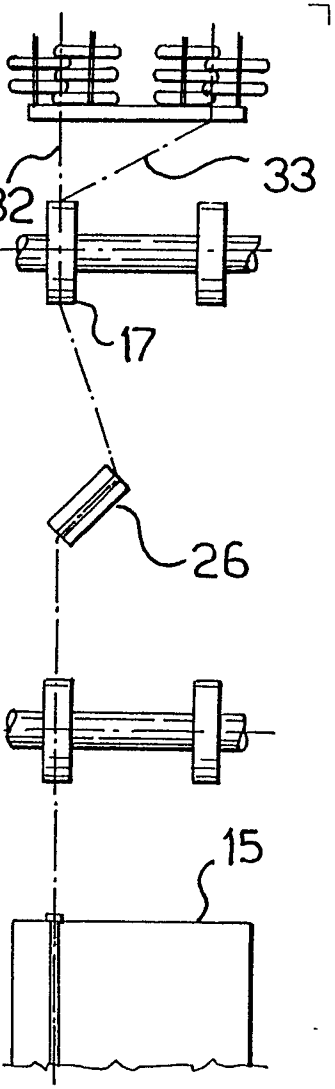

FIG.8