PRODUCTION OF TYRE CORD AND LIKE YARN

Fig. 7.

Fig. 8.

Inventor

F. RIDGWAY

D. G. Dowding (Registrar)

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F. RIDGWAY

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PRODUCTION OF TYRE CORD AND LIKE YARN

Frank Ridgway, Edgeley, Stockport, England, assignor to
Arnold Cathcart & Company Limited, Stockport,
England, a British company

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This invention relates to machines for the production
of tyre cord and like yarn and is an improvement in or
modification of the invention described and claimed in my
prior United States patent application No. 468,480.

The object of the present invention is to improve the
machine of the said prior specification by reducing the
overall length of the machine for any particular number
of upwisting and cabling spindles.

The invention consists in an improvement in or
modification of the machine for producing tyre cord or like
yarn as claimed in claim 1 of my prior specification No.
468,480 according to which the upwisting spindles asso-
ciated with a cabling or doubling spindle in producing a
single tyre cord or like yarn are arranged partly in the
general line of the doubling or cabling spindles in the
machine and partly in front of the other upwisting
spindle or spindles in such line.

The invention further comprises a machine as afo-
said comprising at each side in line two upwisting
spindles, two cabling spindles, two upwisting spindles
followed by repeats of two cabling spindles and two up-
wisting spindles and finishing with two upwister spindles
after two cabling spindles, with one upwister spindle in
front but slightly to one side of each upwister spindle
in the line with the exception of the last pair of upwister
spindles at each end of the line.

Referring to the accompanying explanatory drawings:
Figure 1 is a front elevation of parts of a combined
upwisting and ring doubling machine constructed in ac-
cordance with the present invention.

Figure 2 is a plan view of Figure 1.

Figure 3 is a top view of the two sides of a machine
as shown in Figure 1, the view showing two upwister
spindles at each side of the machine.

Figure 4 is a plan view showing the drivers to four
upwister spindles at each side of the machine.

Figure 5 is a plan view showing the drive to two ring
upwister spindles, one at each side of the machine.

Figure 6 is a front view showing the means for simul-
taneously braking a ring doubling spindle and its asso-
ciated two upwister spindles.

Figure 7 is a plan view of the braking arrangement
shown in Figure 6.

Figure 8 is an end view similar to Figure 3 but showing
a doubling spindle at each side of the machine.

The single yarn which may be upon double flanged
bobbins a on upwister spindles b is upwistered from the
bobbins a so that a certain degree of additional twist is
imparted to the yarn, the latter passing through flyers c
and lappet guides d around guide pegs e and f, around
delivery rollers g as shown in Figure 3, through lappet
guides h, travellers on the rings i and on to the bobbins j
on the ring twisting or cabling spindles k.

It will be seen by reference to Figures 1 and 2 that
each doubling spindle k cooperates with two upwister
spindles b, and that one of such pair is not in the general
line of the spindles at opposite sides of the machine but
is in front of its cooperating upwister spindle but slightly
to one side thereof.

The pegs e and f are mounted on a rod m which is
given short reciprocatory movements so that the yarn does
not travel continuously in the same track on the delivery
rollers g but moves slightly backwards and forwards
thereon.

The upwister spindles are driven in pairs (one at each
side of the machine) as shown in Figures 5 and 8. The
shaft o which is driven in unison with the shaft p through
change speed gearing q (shown in Figure 4) has thereon
a series of pulleys q which drive belts r on the wharves
of the doubling spindles k. The belts pass over tension-
ing or jockey pulleys s. The shaft p has a series of pulleys
r thereon which drive the upwister spindles b (as shown
in Figures 3 and 4) through belts u. It will be seen that
each belt u drives four upwister spindles b. The four
upwister spindles b associated with a pair of doubling
spindles k at each side of the machine are driven by two
belts as shown clearly in Figure 4. v indicates tension-
ing or jockey pulleys for the belts driving the upwister
spindles.

Each doubling spindle k and its associated pair of up-
wister spindles b are adapted to be stopped simulta-
neously, if necessary due to yarn breakage or other
cause, by brakes w mounted in pivoted brake holders x
operated from a single foot operated pedal y. Such pedal
y is pivoted about a fixed support z and operates a rod t
which engages at its upper end beneath a three armed
member l, each arm of which has a short vertical rod 12
resting thereon which engages a member 13 adapted when
raised to turn the pivoted brake holders x about their
 pivots 14 and so cause the brake pads w in such holders
to engage simultaneously the wharves on the associated
upwister and doubling spindles.

The speed of the bottom delivery rollers g can be
changed to vary the rate of delivery of yarn to the
doubling spindle bobbins j to give the required turns per
inch in the finished yarn or cord. To obtain the correct
turns per inch in the yarn from the upwister bobbins a,
it is necessary to adjust the speed of the upwister
spindles b relatively to the speed of the doubling spindles
k. This is done by the change speed gearing q shown in
Figures 3 and 4.

The threading of the yarn is from the upwister bob-
bins a through their flyers c, the lappet guides d round the
guide pegs e and f, through the delivery rollers g, and a lappet h
to the usual traveller on the ring i around the doubling
bobbin j.

With my present improvement in relation to the inven-
tion described and claimed in my prior specification No.
468,480, I am enabled to obtain a greater productive
capacity in a certain length of machine by arranging one
upwister spindle b of each pair in front of the other
spindle of the pair instead of in line with such other spindle
and its associated doubling spindle.

In a complete machine there are in line two upwister
spindles at one end succeeded by pairs of cabling or
doubling spindles and pairs of upwister spindles,
there being an upwister spindle in front but slightly to
one side of each upwister spindle in the line with the
exception of the last pair of upwister spindles at each
end of the line. This arrangement enables the drives to
all the upwister spindles to be as shown in Figure 4.

If desired three upwister spindles may be associated
with each doubling spindle, two of such spindles being in
line with the doubling spindle and the other upwister
spindle being in front of the two associated upwister
spindles.

What I claim is:
1. A machine for producing tire cord and like yarn
comprising a plurality of sets of spindles along each side of the machine, each set comprising at least two upwinding spindles and one cabling spindle, the upwinding spindles being disposed along each side of the machine partly in the general line of the cabling spindles and partly in front of such line, two cabling spindles being disposed between two upwinding spindles in said line, a flyer on each upwinding spindle for passing the yarn from the bobbin of the spindle, delivery rollers on the machine for feeding the yarn from the flyers, the yarn being united at the delivery side of the rollers, a traveller adjacent a cabling spindle for guiding the united yarn to the bobbin on the cabling spindle and a lappet between the delivery rollers and traveller for guiding the united yarn to the traveller, means driving all the upwinding spindles in unison and in a direction opposite to the cabling spindle, means varying the speed of the upwinding spindles and the delivery rollers relative to the cabling spindles to obtain the desired twist in the yarn and further means applying a braking effect simultaneously to each set of upwinding spindles and its associated cabling spindle.

2. A machine as defined in claim 1 including at each side in line two upwinding spindles, two cabling spindles, two upwinding spindles, two cabling spindles followed by repeats of two upwinding spindles and two cabling spindles and terminating in two upwinding spindles following two preceding cabling spindles all in line, with an additional upwinding spindle in front of and slightly to one side of each upwinding spindle in the line of spindles at the positions where two upwinding spindles come between two cabling spindles.

3. In a machine as claimed in claim 2, means for driving the upwinding spindles associated with a pair of doubling or cabling spindles at opposite sides of the machine comprising two continuous belts, each belt driving two upwinding spindles at each opposite side of the machine.

4. A machine as defined in claim 1 including a shaft, pulleys on such shaft to drive all of the cabling spindles, a second shaft, and pulleys on the second shaft to drive all of the upwinding spindles and change speed gearing through which the upwinding spindles are driven from the pulleys on the second shaft.

5. A machine as defined in claim 1 including a change speed gearing through which the delivery rollers are driven from the shaft driving the cabling spindles.

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