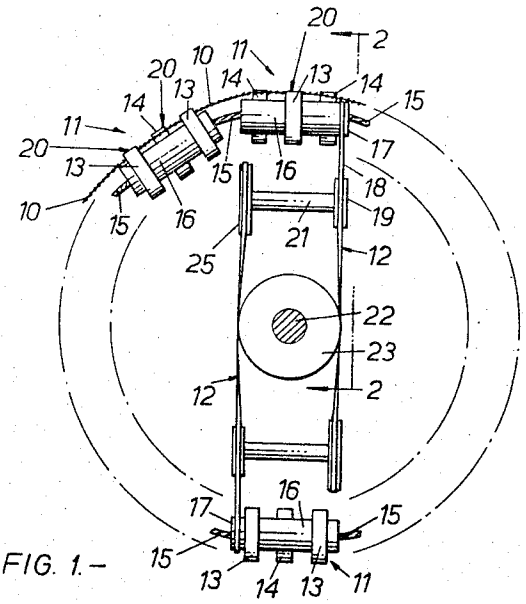
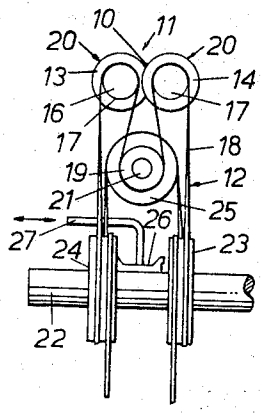
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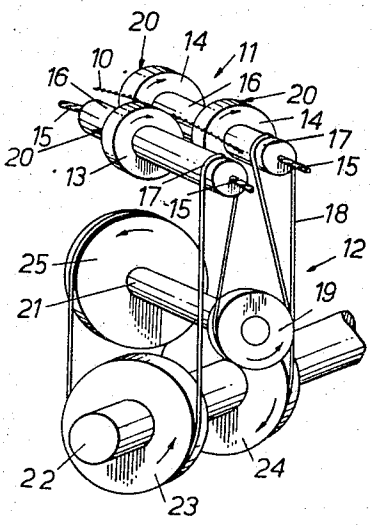
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— FIG. 1. —



— FIG. 2. —



— FIG. 3. —

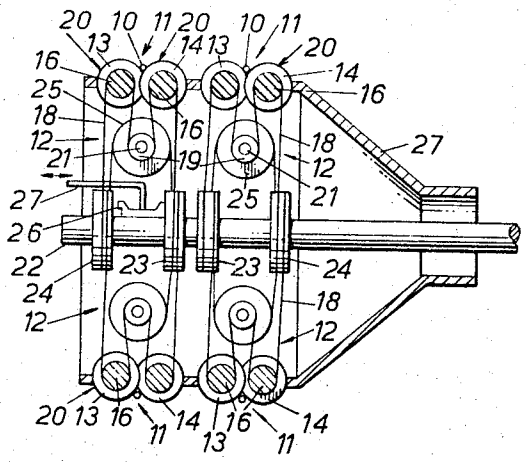
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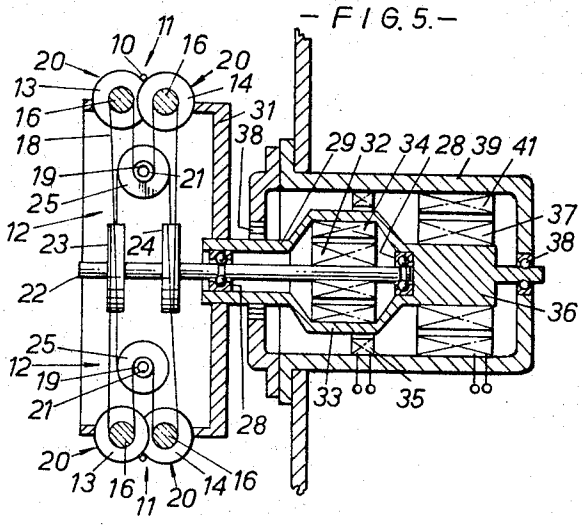
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-FIG. 4.-



-FIG. 5.-

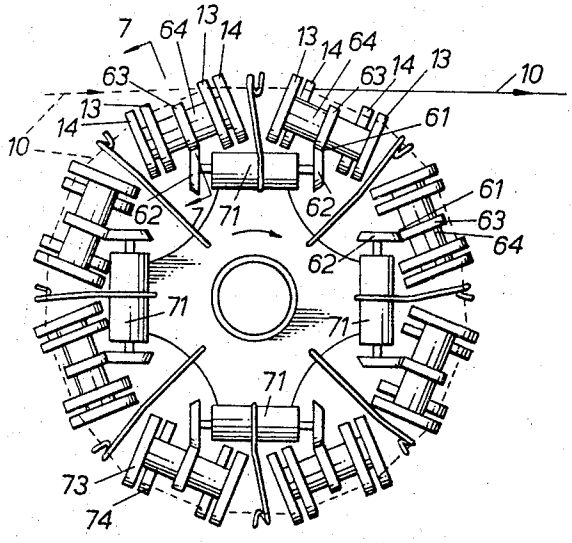


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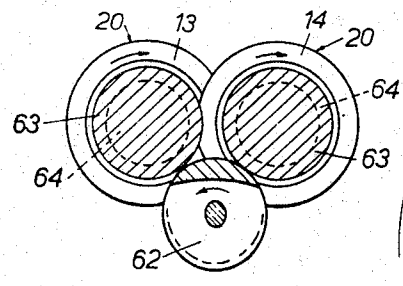
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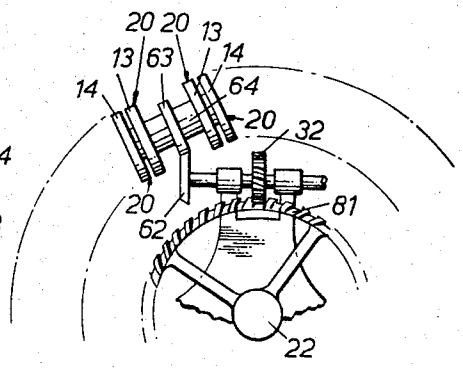
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— FIG. 6. —



— FIG. 7. —



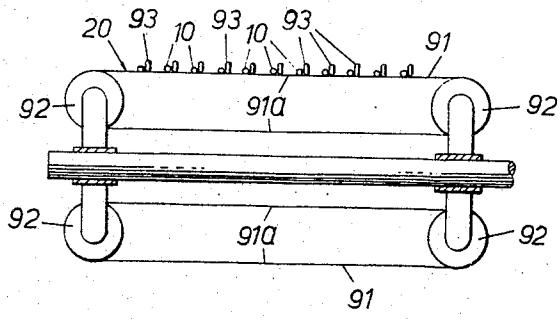
— FIG. 8. —

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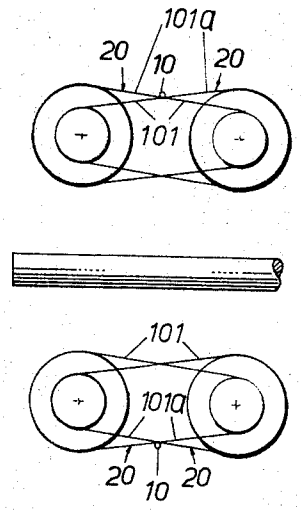
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— FIG. 9. —



— FIG. 10. —

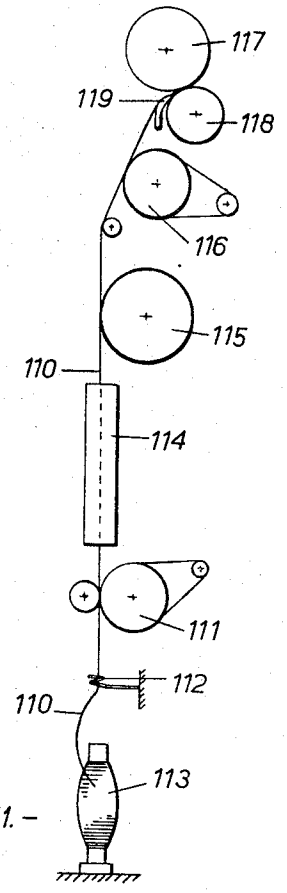


FIG. 11. —

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TEXTILE APPARATUS

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Claims priority, application Great Britain, Apr. 30, 1963, 16,883/63; June 11, 1963, 23,185/63; Jan. 16, 1964, 2,076/64; Feb. 20, 1964, 7,042/64
22 Claims. (Cl. 57—77.42)

This invention provides improvements in or relating to textile apparatus.

The invention comprises apparatus adapted to false twist yarn, comprising a plurality of surfaces adapted to engage an advancing yarn, to move with the yarn in the direction of yarn advance, and to move transversely of said direction.

The invention also comprises apparatus adapted to false twist yarn, comprising a plurality of surfaces adapted to engage an advancing yarn and adapted for translational movement perpendicularly to the yarn path and for rotational movement about an axis perpendicular to said yarn path.

The invention also comprises apparatus adapted to false twist yarn, comprising a plurality of surfaces adapted to engage an advancing yarn and adapted for rotational movement about an axis parallel to the yarn path and for translational movement in the direction of the yarn path.

The invention also comprises apparatus adapted to false twist yarn, comprising a plurality of surfaces adapted to engage an advancing yarn and adapted for rotational movement about an axis parallel to the yarn path and for rotational movement about an axis perpendicular to the yarn path.

Said surfaces may be surfaces of members of circular cross section. Said surfaces may be cylindrical surfaces. Said surfaces may be peripheral surfaces of disc-like members.

The invention also comprises apparatus adapted to false twist yarn, comprising a plurality of circular disc-like members adapted to revolve in a circular path and to rotate with equal peripheral speeds about axes directed tangentially to said circular path.

The invention also comprises apparatus adapted to false twist yarn, comprising a first and a second plurality of circular disc-like members adapted respectively to revolve in said first and second coaxial circular paths and to rotate with equal peripheral speeds about axes directed tangentially to said circular paths.

The invention also comprises apparatus adapted to false twist yarn, comprising a plurality of sets of circular disc-like members adapted to revolve in a circular path, each set comprising a pair of disc-like members mounted for rotation on a common first axis and separated in the direction of said first axis, and a third disc-like member or another pair of members located axially between the members of said pair of disc-like members and mounted for rotation on a second axis parallel to said first axis, said axes being directed tangentially to said circular path. The apparatus may comprise at least three of said sets of circular disc-like members and may comprise ten of said sets.

The members of said first and said second pluralities may be equiangularly spaced respectively around said first and second coaxial circular paths, a plane perpendicular to the axes of any circular disc-like member and axially bisecting the said member may contain the axis about which said pluralities of members are adapted to revolve, and each member of said second plurality may be located circumferentially midway between two adjacent members of said first plurality. The apparatus may

comprise at least six and may comprise twenty of said circular members.

Said circular disc-like members may be disposed within two hypothetical toroidal surfaces which cut each other.

The apparatus advantageously comprises means adapted to rotate said circular disc-like members.

The apparatus advantageously comprises a shaft member adapted for rotation relative to the revolution of said circular disc-like members. Said shaft member advantageously comprises a shaft coaxial with the axis about which said disc-like members are adapted to revolve.

The apparatus advantageously comprises belt drive means adapted to rotate at least one of said circular disc-like members.

The apparatus advantageously comprises belt drive means adapted by rotation of said shaft member relative to the revolution of said circular disc-like members to rotate at least one of said circular disc-like members.

Disc-like members adapted to be rotated by said belt drive means may be carried on and rigidly connected to shaft members having belt engaging paths.

The apparatus advantageously comprises a shaft coaxial with the axis about which said disc-like members are adapted to revolve, first and second belt engaging pulleys spaced axially on the shaft, said first pulley being fixed with respect to said shaft and said second pulley being rotatable with respect to said shaft.

The apparatus advantageously comprises a shaft coaxial with the axis about which said disc-like members are adapted to revolve, first and second belt engaging pulleys spaced axially on the shaft, and means operable to fix either said first or said second pulley with respect to said shaft.

The apparatus advantageously comprises idler means adapted to guide a belt between said first and second pulleys and between adjacent belt engaging parts of circular disc-like members or shafts carrying said disc-like members. Said idler means advantageously comprises idler pulleys free to rotate about axes fixed in a member adapted to revolve with said disc-like members. Said axes may be parallel to the axes of the circular disc-like members adapted to be engaged by said belt. The axis about which at least one of said idler pulleys is free to rotate may be adapted to be displaced towards and away from said circular disc-like members.

The apparatus advantageously comprises gearing adapted to rotate at least one of said circular disc-like members. Said gearing advantageously comprises a helical toothed gear adapted for rotation relative to the revolution of said disc-like members meshing with a toothed gear connected to rotate at least one of said disc-like members.

The apparatus advantageously comprises friction drive means adapted to rotate at least one of said circular disc-like members.

The apparatus advantageously comprises electrical drive means adapted to revolve with said circular disc-like members. Said electric drive means may be adapted to rotate said disc-like members directly or indirectly, through friction or toothed gear drive transmitting means. Said electric drive means advantageously comprises a plurality of electric motors adapted to revolve with said circular disc-like members and each adapted to rotate a plurality of said disc-like members, and advantageously comprises four electric motors each adapted to rotate eight circular disc-like members.

The apparatus advantageously comprises flexible rotary drive transmitting means adapted to rotate at least one of said circular disc-like members. Two of said circular disc-like members may be interconnected by flexible rotary drive transmitting means. Said flexible rotary drive transmitting means may be connected to and adapted to be driven by shaft means coaxial with and adapted for rota-

tion relative to the revolution of said circular disc-like members.

The invention also comprises in combination, two apparatus as herein described, adapted on selection to impart twist in the same sense, in either direction, or in opposite senses, to each of two yarns. The invention also comprises in combination, two apparatus as herein described, adapted to be driven by a common shaft.

A shaft rotatable with respect to the revolution of said circular disc-like members and adapted to transmit drive to those members, may be adapted to be held fixedly while said members revolve, or may be adapted to be rotated by drive means such as belt or electric drive means.

The invention also comprises apparatus adapted to false twist yarn, comprising a plurality of circular disc-like members adapted to move in a closed non-circular path and to rotate with equal peripheral speeds about axes directed tangentially to said path. Said surfaces may be surfaces of flexible belts, which may be entrained on pulleys adapted to rotate about their axes and to revolve about an axis parallel to the free runs of the belts. The apparatus advantageously comprises yarn guiding means adapted to limit movement of yarn parallel to the free runs of the belts. Otherwise adjacent belts may have skew free runs and the movement of a yarn on the free runs of the belts may be limited by yarn tension. The apparatus advantageously comprises driving means adapted to rotate pulleys over which said flexible belts are entrained, and advantageously comprises driving means adapted to cause said flexible belts to revolve about an axis perpendicular to the direction of yarn advance.

Apparatus as herein described as having circular disc-like members advantageously comprises a plurality of flexible belts each entrained over at least two circular disc-like members and adapted to contact yarn whereby to impart false twist to said yarn.

The invention also comprises apparatus as herein described in combination with yarn feeding means, yarn heating means and yarn wind-up means, adapted to crimp yarn. The invention also comprises a textile machine comprising a plurality of apparatus as herein described. Said textile machine advantageously comprises a single heating element common to a plurality of said apparatus.

The invention also comprises a method of false twisting yarn comprising the step of imparting to the yarn an advancing motion and a rotation about its lengthwise direction by bringing the yarn into contact with a plurality of surfaces moving in the direction of advance of the yarn and moving in a direction perpendicular to said direction of advance. The yarn may travel in a looped path whilst in contact with said surfaces.

The invention also comprises a method of crimping yarn comprising the steps of false twisting the yarn as herein described and setting the yarn whilst twisted. Said setting may be effected by heat.

The invention also comprises a method of crimping yarn as herein described, performed at a speed of yarn advance at least of 500 yards per minute, and preferably up to 2,000 yards per minute.

Embodiments of apparatus and combinations according to the invention will now be described with reference to the accompanying drawings in which

FIGURE 1 is an elevation,

FIGURE 2 is a view on the line 2—2 of FIGURE 1,

FIGURE 3 is a perspective view of the belt drive means of the apparatus shown in FIGURES 1 and 2,

FIGURE 4 is an axial section of another embodiment,

FIGURE 5 is an axial section of another embodiment,

FIGURE 6 is an elevation of another embodiment,

FIGURE 7 is a section on the line 7—7 of FIGURE 6, to a larger scale,

FIGURE 8 is an elevation of part of another embodiment,

FIGURE 9 is an axial section of another embodiment,

FIGURE 10 is a diagrammatic section of another embodiment, and

FIGURE 11 is a diagrammatic illustration of a yarn crimping arrangement.

All the figures illustrate apparatus adapted to false twist yarn comprising a plurality of surfaces **20** adapted to engage an advancing yarn **10**, to move with the yarn in the direction of yarn advance, and to move transversely of said direction, said movements being either translational or rotational movements.

FIGURES 1 to 8 illustrate apparatus wherein said surfaces **20** are surfaces of members of circular cross-section. Said surfaces are cylindrical peripheral surfaces of circular disc-like members. A suitable material is polyurethane.

The apparatus illustrated in FIGURES 1 to 8 comprises a first and a second plurality of circular disc-like members **13, 14** respectively, adapted to revolve in first and second coaxial circular paths and to rotate with equal peripheral speeds about axes directed tangentially to said circular paths. Said first plurality and said second plurality of members **13, 14** are arranged in sets, each set comprising a pair of disc-like members mounted for rotation on a common first axis and separated in the direction of said axis, and a third disc-like member (FIGURES 1 to 3) or another pair of members (FIGURES 6 to 8) located axially between the members of said pair of members and mounted for rotation on a second axis parallel to said first axis, said axes being directed tangentially to the circular path in which the sets of disc-like members revolve.

FIGURES 1 to 8 all illustrate apparatus comprising at least three of said sets of circular disc-like members. FIGURE 1 illustrates apparatus comprising ten of said sets, although only three are shown, and FIGURE 6 illustrates apparatus comprising eight of said sets.

In an alternative embodiment, not illustrated, the members **13, 14** of said first and said second pluralities are equiangularly spaced respectively around said first and second coaxial circular paths, a plane perpendicular to the axis of any circular disc-like member and axially bisecting the said member contains the axis about which said pluralities of members are adapted to revolve, and each member **14** of said second plurality is located circumferentially mid-way between two adjacent members **13** of said first plurality. This apparatus preferably comprises at least six, and may comprise twenty of said circular disc-like members. These members, and those shown in FIGURES 1 to 8, are disposed within two hypothetical toroidal surfaces which cut each other.

The apparatus illustrated in FIGURES 1 to 8, comprise means adapted to rotate said circular disc-like members **13, 14.** Each apparatus comprises a shaft **22** adapted for rotation relative to the revolution of said circular disc-like members **13, 14** and coaxial with the axis about which said disc-like members **13, 14** are adapted to revolve.

The apparatus illustrated in FIGURES 1 to 5 comprise belt drive means **12** adapted to rotate at least one of said circular disc-like members **13, 14** by rotation of said shaft **22** relative to the revolution of said circular disc-like members **13. 14.** All of said disc-like members **13, 14** have equal radii, and disc-like members adapted to be rotated by said belt drive means **12** are carried by and rigidly connected with shaft members **16** all having belt engaging parts **17** of equal radii.

A belt **18** of said belt drive means **12** drives adjacent shaft members **16** and, between said shaft members **16,** engages idler means comprising an idler pulley **19** adapted to revolve with said sets of disc-like members **13, 14** and to rotate about a shaft **21.** To accommodate change in belt length with age, the idler pulley **19** is mounted so that its distance from the shaft members **16** can be adjusted. One form of mounting (not illustrated) comprises a bearing mounted on the shaft to be capable of rotation about an axis not passing through the centre of the bearing and capable of being fixed in any angular position.

The belt **18** engages a first pulley **23** fixed with respect to said shaft **22** and, spaced from said first pulley **23** axially of said shaft **22**, a second pulley **24** on and rotatable with respect to said shaft **22**, and between said first and second pulleys **23**, **24**, idler means comprising an idler pulley **25** mounted for rotation on the shaft **21** and therefore adapted to revolve with said disc-like members.

FIGURES 2 and 4 however, illustrate apparatus wherein both the pulleys **23** and **24** are capable of rotation with respect to the shaft **22**, comprising means adapted selectively to fix either of said pulleys **23**, **24** with respect to the shaft **22**, said means comprising a tongued member **26** slidable in an axially directed groove in the shaft **22** between a first position in which a tongue engages one of said pulleys **23**, **24** to fix it with respect to said shaft **22**, and a second position in which another tongue engages the other of said pulleys **23**, **24** to fix it with respect to said shaft **22**. The tongued member **26** has an operating rod **27** extending to clear of the belt drive means **12**. Whichever of the pulleys **23**, **24** is fixed, determines the sense of rotation of the disc-like members **13**, **14** for a given sense of revolution of the disc-like members **13**, **14** and a given direction of rotation of the shaft **22**.

FIGURE 8 illustrates apparatus comprising a helical toothed gear **81** adapted for rotation relative to the revolution of said disc-like members **13**, **14** meshing with a toothed gear **82** connected to rotate eight of said disc-like members **13**, **14**, arranged in two sets of four.

FIGURES 6, 7 and 8 illustrate apparatus comprising friction drive means **61** adapted to rotate all of said circular disc-like members. Said friction drive means **61** each comprise a bevelled friction wheel **62** frictionally engaging a roller **63** fixed on a shaft member **64** carrying a pair of disc-like members **13**, or **14**.

FIGURES 6 and 7 illustrate apparatus comprising electric drive means **71** adapted to revolve with said circular disc-like members and to rotate said disc-like members indirectly through friction drive transmitting means **61**. Said electric drive means **71** may however be adapted to rotate said disc-like members directly, or through toothed gear drive transmitting means, neither of which arrangements is illustrated. Said electric drive means **71** comprise a plurality of electric motors adapted to revolve with said circular disc-like members **13**, **14**, and each adapted to rotate eight of said circular disc-like members **13**, **14**.

FIGURES 1 and 3 illustrate apparatus comprising flexible rotary drive transmitting means adapted to rotate at least one of said circular disc-like members. All of said circular disc-like members **13** are interconnected by flexible rotary drive transmitting means **15**, and all of said disc-like members **14** are similarly interconnected. Thus it is not necessary to drive more than one or two of the shaft members **17** directly by the belt drive means **12**.

In another arrangement, not illustrated, flexible rotary drive transmitting means may be connected to and adapted to be driven by the shaft **22**.

FIGURE 4 illustrates in combination two apparatus as described with reference to FIGURES 1 to 3, adapted on selection to impart twist in the same sense, in either direction or in opposite senses to each of two yarns **10**, and adapted to be driven by a common shaft **22**. The disc-like members **13**, **14** on each of the apparatus are carried on a drum **27** and the pulleys **23**, **24** of each apparatus are mounted on the shaft **22** so that the two apparatuses are adapted to be driven by said shaft **22**. The senses of rotation of the disc-like members **13**, **14** of the two apparatuses are the same or opposite, depending on the position of the tongued member **26**. Opposite senses of rotation of the disc-like members of either apparatus are achieved by opposite senses of rotation of the shaft **22** with respect to the revolution of the disc-like members **13**, **14**. Each apparatus, therefore can twist a yarn in either direction and the combination can twist two yarns in the same sense in either direction or in opposite senses.

If desired, the shaft **22** of FIGURE 4 may be adapted to be held fixedly while said members **13**, **14** revolve. Otherwise said shaft **22** may be adapted to be rotated by drive means, for example by belt drive means, by holding the shaft **22** in bearings and providing it with a belt engaging pulley.

FIGURE 5 illustrates apparatus wherein the shaft **22** is adapted to be rotated by electric drive means. The shaft **22** is supported for rotation in bearings **28** in supporting means comprising a hollow shaft **29** carrying a drum **31** carrying said disc-like members **13**, **14**. The shaft **22** carries a winding **32** of an electric drive means, and to the hollow shaft **29** is attached a casing **33** in which is carried another winding **34**. A winding **35** located outside the casing **33** is adapted for connection to a source of alternating electric current whereby to energise the windings **32**, **34** of the electric drive means. To the casing **33** is attached a shaft **36** carrying a winding **37** of a second electric drive means. The shafts **33**, **36** are carried in bearings **38** of an outer casing **39** in which are carried the winding **35** and another winding **41** of the second electric drive means adapted for connection to a source of alternating electric current.

In another arrangement, not illustrated, the apparatus advantageously comprises a plurality of circular disc-like members **13**, **14** adapted to move in a closed non-circular path, defined, for example, by a belt or by tracks adapted to receive carriages carrying sets of the members **13**, **14**, and said members **13**, **14** being adapted to rotate with equal peripheral speeds about axes directed tangentially to said path.

FIGURES 9 and 10 illustrate apparatus wherein said surfaces are surfaces of flexible belts **91** entrained on pulleys **92** adapted to rotate about their axes and to revolve about an axis parallel to the free runs **91***a* of the belts. The apparatus comprises yarn guiding means **93** adapted to limit movement of yarn parallel to the free runs **91***a* of the belts **91**.

FIGURE 10 illustrates apparatus wherein adjacent belts **101** have skew free runs **101***a* and the movement of a yarn **10** on the free run **101***a* is limited by yarn tension.

The embodiments illustrated in FIGURES 9 and 10 advantageously comprises driving means adapted to rotate pulleys over which said flexible belts are entrained and driving means adapted to cause said flexible belts to revolve about an axis perpendicular to the direction of yarn advance. Said driving means may be similar to the driving means described with reference to and as illustrated in FIGURES 1 to 8 for rotating the circular disc-like members **13**, **14**.

FIGURE 11 illustrates apparatus adapted to crimp yarn comprising a yarn feed roller and twist stopping system **111** arranged to withdraw yarn **110** over a yarn stabiliser **112** from a package **113** and forward the yarn **110** through a heater **114** to apparatus **115** adapted to false twist yarn as herein described. The apparatus further comprises a forwarding roller arrangement **116** withdrawing yarn **110** from the apparatus **115** and forwarding the yarn **110** to wind-up means consisting of a rotating yarn package **117**, a package rotating bowl **118**, and an oscillating traverse guide **119**. A textile machine may comprise a plurality of apparatus as illustrated in FIGURE 11, and may comprise a single heating element common to a plurality of said apparatus.

With any of the apparatus herein described with or without reference to the accompanying drawings, yarn may be false twisted by a method comprising the step of imparting to the yarn an advancing motion and a rotation about its lengthwise direction by bringing the yarn into contact with a plurality of surfaces moving in the direction of advance of the yarn and moving in a direction perpendicular to said direction of advance, the yarn travelling in a looped path whilst in contact with said surfaces. Yarn may be crimped by thus false twisting the yarn and setting the yarn whilst twisted, said setting preferably being ef-

fected by heat. Yarn may be crimped at a speed of yarn advance at least of 500 yards per minute, and up to 2,000 yards per minute.

What we claim is:

1. Apparatus for false-twisting yarn traveling along a predetermined path through a twisting station, comprising, in combination, a plurality of movable yarn-twisting means adapted to be mounted on a support movable at said yarn-twisting station consecutively into said predetermined path, then along and subsequently out of the same, so as to sequentially engage successive portions of said yarn during movement of the same along said predetermined path; and means for actuating each of said movable yarn-twisting means for yarn-twisting operation at least while the yarn-twisting means are moving at said yarn-twisting station along said path in engagement with said yarn, said plurality of movable yarn-twisting means thus consecutively twisting successive portions of said yarn while moving together with the same through said yarn-twisting station.

2. Apparatus as defined in claim 1, wherein said predetermined yarn path is arcuate, and wherein each of said movable yarn-twisting means comprise a first and a second plurality of disc-shaped members, the members of said first and second plurality being respectively arranged to revolve in first and second coaxial circular paths to thereby move into, along and out of said predetermined path, and the members of said first and second plurality also being arranged to rotate with equal peripheral speeds about axes directed tangentially to said circular paths to thereby twist such successive portions of the yarn as are engaged by consecutive ones of said members of said first and second plurality.

3. Apparatus as defined in claim 1, wherein said yarn-twisting means comprise rotary members each having an outer peripheral face of circular outline, said members being rotatable about a first axis normal to the elongation of said predetermined path and about a second axis extending substantially in the direction of movement of said members.

4. Apparatus as defined in claim 3, wherein said predetermined path is circular, and wherein the respective second axes extend tangentially to said path.

5. Apparatus as defined in claim 4, wherein said members are arranged in pairs angularly spaced along said circular path for coaxial rotation, each of said pairs of members being adapted to jointly sequentially engage said successive portions of said yarn.

6. Apparatus as defined in claim 5, wherein said pairs of members are equidistantly spaced from one another.

7. Apparatus as defined in claim 5, and further comprising drive means for rotating said members about said second axes; and motion-transmitting means operatively connected with said drive means and with at least one of said members for transmitting rotary motion to the same.

8. Apparatus as defined in claim 4, wherein said members are of disc-shaped configuration and arranged in pairs angularly spaced along said circular path for coaxial rotation, the members of each pair being spaced from one another in direction of said path; and further comprising an additional rotary disc-shaped member associated with each pair of members, said additional rotary member being located intermediate the members of the respective pair and being mounted for rotation in a circular path coaxial with that of said pair but of lesser diameter, whereby each of said yarn portions extends between and is engaged by all three of said members.

9. Apparatus as defined in claim 8; and further comprising drive means for rotating said members about said second axes; motion-transmitting means operatively connected with said drive means and with at least one of said members for transmitting rotary motion to the same; and flexible coupling means interconnecting at least two of said members for joint rotation.

10. Apparatus as defined in claim 9; and further comprising rotary shaft means coaxial with said first axis and operatively connected with said flexible coupling means for rotating the same and thereby the respective interconnected members.

11. Apparatus as defined in claim 1, wherein said yarn-twisting means comprise rotary members each having an outer peripheral face of circular outline, said predetermined path being endless and of other-than-circular configuration and said members being adapted for movement in said path.

12. Apparatus as defined in claim 1, wherein said yarn-twisting means comprise a plurality of rotary members, each arranged for rotation about an axis extending other-than-normal to the elongation of said path; and means operatively connected with said members for rotating the same about said axes with equal peripheral speed.

13. Apparatus as defined in claim 1, wherein said yarn-twisting means comprise endless flexible rotary belts arranged to rotate in direction transversely of the elongation of said path and to simultaneously move along said path.

14. Apparatus as defined in claim 13; and further comprising yarn guiding means arranged for limiting movement of said yarn portions parallel to the free runs of the respective belts.

15. Apparatus as defined in claim 13, wherein adjacent ones of said belts have skew free runs, and wherein movement if yarn portions engaged by said free runs is limited by tension of said yarn.

16. A method of false twisting a yarn in a twisting zone of predetermined length having an upstream and a downstream end, comprising the steps of engaging at said upstream end successive yarn portions of a longitudinal extension less than said predetermined length and continuously advancing such successive yarn portions through said twisting zone to said downstream end thereof; and continuously twisting each of said successive yarn portions while it is engaged and is being advanced through said twisting zone from said upstream end to said downstream end thereof.

17. A method as defined in claim 16, wherein said twisting zone is of arcuate outline as seen in the direction intermediate said upstream and downstream ends thereof.

18. A method as defined in claim 16, wherein each of said successive yarn portions is twisted continuously while it is engaged and being advanced.

19. A method as defined in claim 16; and further comprising the step of setting said yarn portions while the same are in twisted condition.

20. A method as defined in claim 16, wherein the step of advancing said yarn portions comprises moving the same through said twisting zone at a speed ranging between 500 and 2000 yards per minute.

21. A method as defined in claim 16; and further comprising the step of maintaining such sections of said yarn as are upstream of said yarn-twisting zone at a first predetermined tension, and such sections as are downstream of said yarn-twisting zone at a second predetermined tension different from the first one.

22. A method of false twisting a yarn in a twisting zone of predetermined length having an upstream and a downstream end, comprising the steps of engaging at said upstream end successive spaced yarn portions each being of a longitudinal extension less than said predetermined length and continuously advancing such successive yarn portions through said twisting zone to said downstream end thereof; and continuously twisting each of said successive yarn portions while it is engaged and is being advanced through said twisting zone from said upstream end to said downstream end thereof.

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