April 21, 1931. H. P. RUF 1,801,388

RUFF CORD MAKING MACHINE

Filed June 4, 1930

Fig. 1

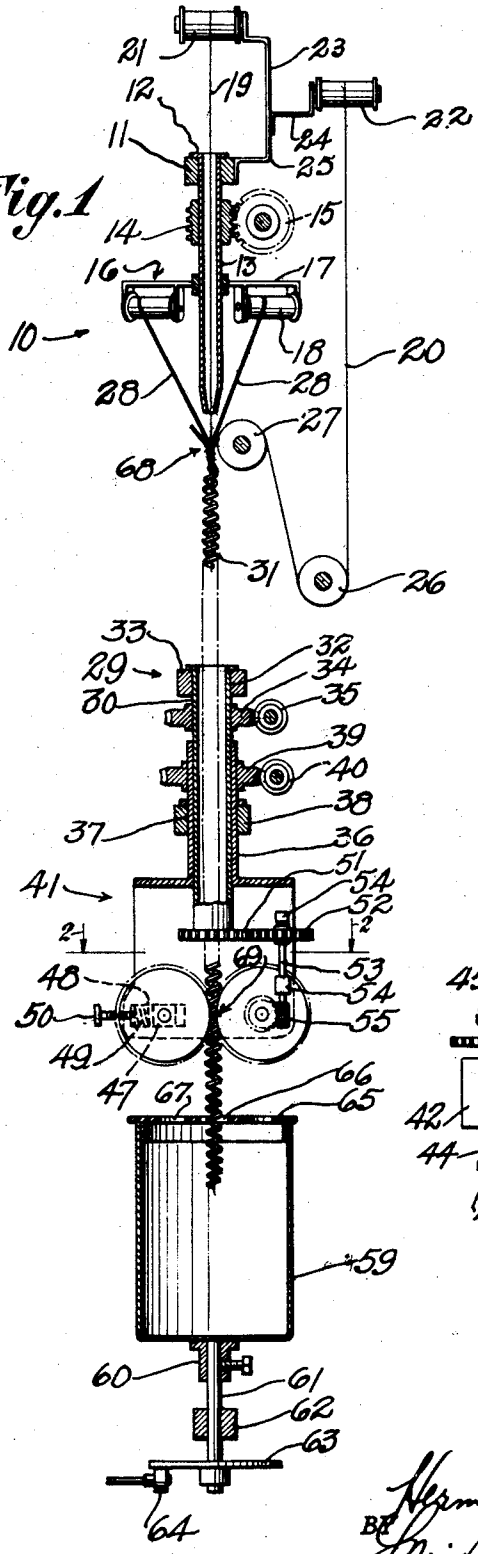


Fig. 3

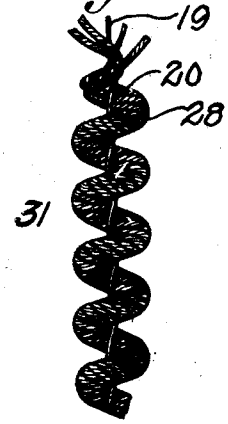
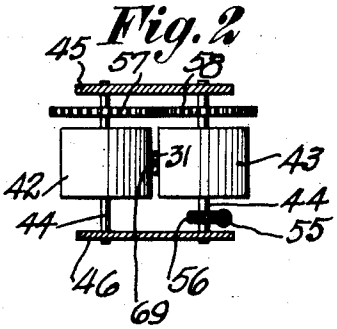


Fig. 2



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RUFF-CORD-MAKING MACHINE

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This invention relates to machinery for the manufacture of twisted cord or other articles.

One object of the invention is to provide an improved compact machine of the character described that can produce any type of twisted cord or ornamental article, particularly ruff cord, but also chenille or other cord with uniform continuous characteristics.

Heretofore machines for producing ruff cord and the like, have been provided with horizontal alleys of considerable length, along which alleys the ruff cord was moved and twisted. These alleys would vary between fifteen and twenty feet in length, the fliers being at one end of the alleys and the twisting means and spools at the other end.

It is therefore another object of this invention to produce an improved machine for the manufacture of ruff cord, or the equivalent, in which the alleys are eliminated, the entire machine being simple and compact so as to occupy a minimum of floor space and to be relatively inexpensive to construct.

Another object of the invention is to construct an improved machine of the class alluded to in which the ruff cord is maintained along a straight line during the entire manufacturing and twisting operation, the several co-ordinated parts of the machine being suitably alined for this purpose, so that not only is the construction of the machine simplified, but idlers, guides and other parts avoided which tend to deform an ornamental cord.

Another object of the invention is to produce an improved machine as above stated for making ruff or other cord, in which the pitch of the cord may be adjusted and varied.

A further object of the invention is to provide an improved machine of the nature set forth in which the ruff cord is laid uniformly in a container instead of being wound upon a spool.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated on the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is a view in vertical section of a machine embodying the invention, with parts of the drive omitted.

Fig. 2 is a horizontal sectional view taken on lines 2—2 of Fig. 1.

Fig. 3 is a view of a piece of the ruff cord produced by the machine.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in one and the same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which this invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Generally described, the invention provides a machine for producing a twisted cord, particularly ruff cord. Ruff cord is of helical form, having a wire core covered by a fabric strand, and another holding wire in proximity to but spaced from the center of the cord and twisted therearound. Thus the holding wire is substantially concealed in the convolutions of the ruff cord. The diameter of the helix as well as the pitch of the convolutions will vary with the rate of twist relative to the rate of feed, as well as with the size or stiffness of the wires. By this invention the flier and guide means for the wires act in alinement with a rotating head having a unitary means to twist the cord and simultaneously feed it through the machine. The unitary means referred to includes rollers of a yielding character which sufficiently grip the ruff cord and yet prevent mutilation or distortion of the delicate parts thereof. To receive the finished ruff cord, a rotary container is mounted in alinement with the rotary head to cause the cord to be uniformly circularly laid in the container. Thus the machine is simple,

compact, and produces a uniform high grade product without the use of long alleys or tracks for the ruff cord between the flier and the twisting means.

Referring in detail to the drawing, 10 denotes a device embodying the invention. The same includes a frame 11 providing a bearing 12 for a hollow vertical spindle or quill 13 journaled therein by any well known structure which may include a bearing flange 12. Affixed to the spindle is a worm gear 14 the teeth of which mesh with those of a worm wheel 15 for rotating the spindle. Mounted upon the spindle is a flier 16 including a bracket structure having arms 17 for rotatably carrying a plurality of spools 18. The latter have a covering strand of any suitable character according to the type of cord to be manufactured.

In the manufacture of ruff cord according to this invention, a core wire 19 is used, and a holding or binding wire 20. The latter may also be defined as the convolution forming wire. The wires 19, 20 are supplied by respective spools 21, 22 mounted on arms 23, 24 of a stationary bracket 25. The core wire 19 is fed through the spindle 13, while wire 20 passes around idlers 26, 27 having fixed axes, to a point adjacent to the lower end of the quill.

The rotation of the flier 16 causes it to wind the strands 28 around the wire core 19. The holding wire is externally fed to the cord, so that as the same is twisted, the holding wire is twisted over the strand covering in a somewhat helical form as hereinafter described.

Underneath and preferably in alinement with the flier is a twisting head 29. The same includes a hollow inner spindle 30 for receiving the ruff cord 31. The said spindle 30 is journaled at 32 in a frame 33, and has affixed thereto a worm 34 turned by a worm wheel 35 to rotate the spindle. Sleeved on the spindle 30 is an outer spindle 36 journaled in a bearing 37 of a frame 38. Affixed to the outer spindle is a worm 39 turned by a worm wheel 40.

Mounted on the outer spindle 36 is a twisting head frame 41 which may be of substantially yoke form to carry a pair of rollers 42, 43 mounted on horizontal axles 44 journaled in the sides 45, 46 of the frame 41. These rollers have a tangent contact surface in alinement with the twisting head 29 to receive herebetween the ruff cord 31 for feeding it downward through the machine. Due to the delicate character of the ruff cord, the rollers have a yielding engagement therewith, for which purpose the rollers are not only made of a resilient material such as rubber, but the roller 42 is mounted to be resiliently urged toward the roller 43. Thus the axle 44 of roller 42 may be journaled in bearing blocks 47 movable along openings 48 by springs 49 adjusted by screws 50.

To turn the rollers at any required predetermined speed, a gear 51 is mounted on the inner spindle 30, turning a gear 52. The latter is fixed on a shaft 53 journaled in bearings 54. Rotated by the shaft is a worm 55 which, in turn, rotates a worm wheel 56 that turns an axle 44. A pair of gears 57, 58 having intermeshing teeth interconnect the axles 44 so that the rollers 42, 43 rotate in opposite directions at an equal velocity.

Mounted in alinement with the twisting head, is a container or can 59 mounted at 60 on a spindle 61 journaled in a frame 62. To rotate the container, a friction disc 63 is secured to the spindle to be turned by an adjustable roller 64.

The container 59 may have a removable cover 65 having a central opening 66 and other spaced openings 67, through any one of which the ruff cord is fed to the container. Preferably the central opening is used. The rotation of the container causes the thread to be laid uniformly circularly in the container avoiding strain or tension. The rate of turn of the container may be so adjusted as to take out any twisting stress in the cord, and this can be accomplished by rotating the container more slowly than the twisting head.

The operation of the machine will now be clearly apparent. The covering strands 28 are wound by the flier around the core strand 19, and the holding strand 20 caused to engage over the covering strands. The latter action is caused by the twisting of the cord by the twisting head. The effective twisting zone or length is the distance between the point 68 where the twisting first occurs, and the tangent point 69 of the rollers 42, 43 where the twisting is actually caused. The rollers constitute a unitary means for feeding the ruff cord through the machine, and for simultaneously twisting the same.

The speed of the flier 16 is of course independent of the speed of the twisting head, and will control merely the amount of covering strand for the cord. The relative speed of rotation of gears 35, 40 may be adjusted by any suitable drive to regulate the relation between the rate of feed of the cord and the rate of twist, thereby determining the pitch of the helix. If a cord other than ruff cord is to be made, the flier can be replaced by another suitable structure.

Thus this invention produces a simple compact machine utilizing a minimum of floor space, and avoding the cumbersome machinery heretofore in use, and the product being even and uniform in character and in the curves of the convolutions.

It will be appreciated that various changes and modifications may be made in the device as shown in the drawing, and that the same is submitted in an illustrative and not

in a limiting sense, the scope of the invention beng defined in the following claims.

I claim:

1. A machine for making ruff cord including a flier, means for centrally feeding a wire into the outlet end of the flier and for laterally feeding a second wire to the flier, the flier being adapted to wind a strand around the first wire, a rotary head alined with the flier and disposed in fixed spaced relation thereto, said rotary head having central means to pull the ruff cord through the flier and to twist the ruff cord into a helical form with the second wire twisted around the central part of the ruff cord, the space between said central means of the rotary head and the flier being free with relation to the twisting so that a uniform twist is obtained along a straight line and over a fixed distance.

2. A machine for making ruff cord including a flier, means for centrally feeding a wire to the flier at the outlet thereof and for laterally feeding a second wire to the flier, the flier being adapted to wind a strand around the first wire, a rotary head alined with the flier in predetermined spaced relation thereto, said rotary head having movable central means to directly grip and pull the ruff cord through the flier and to twist the ruff cord into a helical form with the second wire twisted around the central part of the ruff cord, and a rotary container alined with the rotary head and rotating more slowly than the same to receive the ruff cord and cause the same to be uniformly and circularly laid in the container.

3. A machine for continuously making and feeding therefrom ruff cord or an equivalent cord, including a flier and associated means for guiding core and holding strands with the flier winding a covering strand around the core strand, and rotary means alined with the flier to twist the strands leaving the flier, causing the holding strand to be twisted around the covering strand, said rotary means being in predetermined spaced relation and proximity to the flier and including rotary feeding means gripping the finished ruff cord and twisting the said strands along the length thereof between the flier and the said feeding means.

4. A machine for making ruff cord, including a central core wire guide, a flier to twist a covering strand around the core, means to feed an external holding wire to the strands adjacent to the winding point, means to twist the cord in constant proximity to the winding point and with a uniform tension to cause the holding wire to twist around the covering strand in a helical curve, the twisting means having other rotary means for engaging the cord and pulling the same through simultaneously with the twisting.

5. A machine for making ruff cord, including a central core wire guide, a flier to wind a covering strand around the core, means to feed an external holding wire to the strands adjacent to the winding point, and means relatively stationary to the flier to twist the cord to cause the holding wire to twist around the covering strand in a helical curve, the last mentioned means being in relative proximity to the flier and in alinement therewith, and a rotary container rotatable at a lower speed than the twisting means in alinement with the flier, said container receiving the ruff cord and laying it circularly therein.

6. A machine for making ruff cord, including a central core wire guide, a flier to wind a covering strand around the core, means to feed an external holding wire to the strands adjacent to the winding point, and means to twist the cord to cause the holding wire to twist around the covering strand in a helical curve, and whereby the ruff cord assumes a helical form, the means to twist the cord including yielding cylindrical rollers to engage and feed the completed cord therebetween at a predetermined rate to predetermine the pitch of the ruff cord.

In testimony whereof I affix my signature.

HERMAN P. RUF.