July 8, 1941. D. J. KELMAN 2,248,572

APPARATUS FOR MAKING ORNAMENTAL ARTICLES

Filed Aug. 18, 1939 3 Sheets-Sheet 1

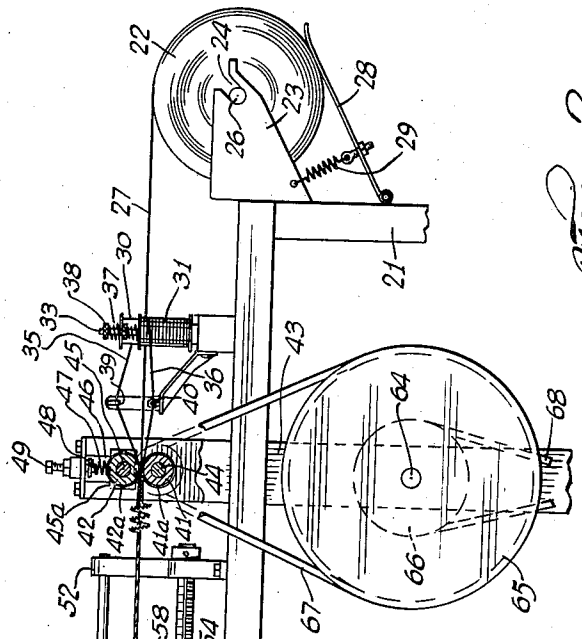


Fig. 1.

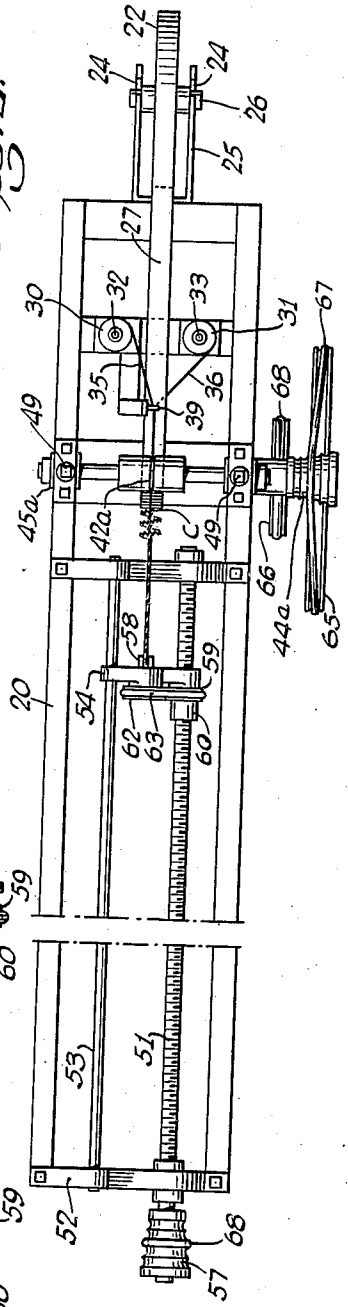


Fig. 2.

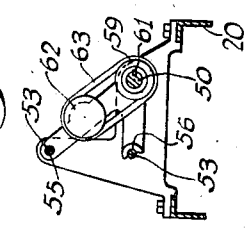


Fig. 3.

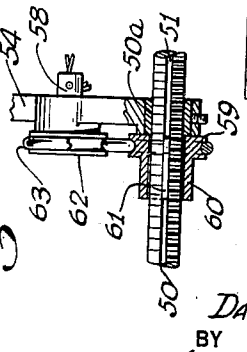


Fig. 4.

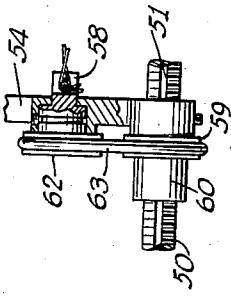


Fig. 5.

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APPARATUS FOR MAKING ORNAMENTAL ARTICLES

Filed Aug. 18, 1939 3 Sheets-Sheet 2

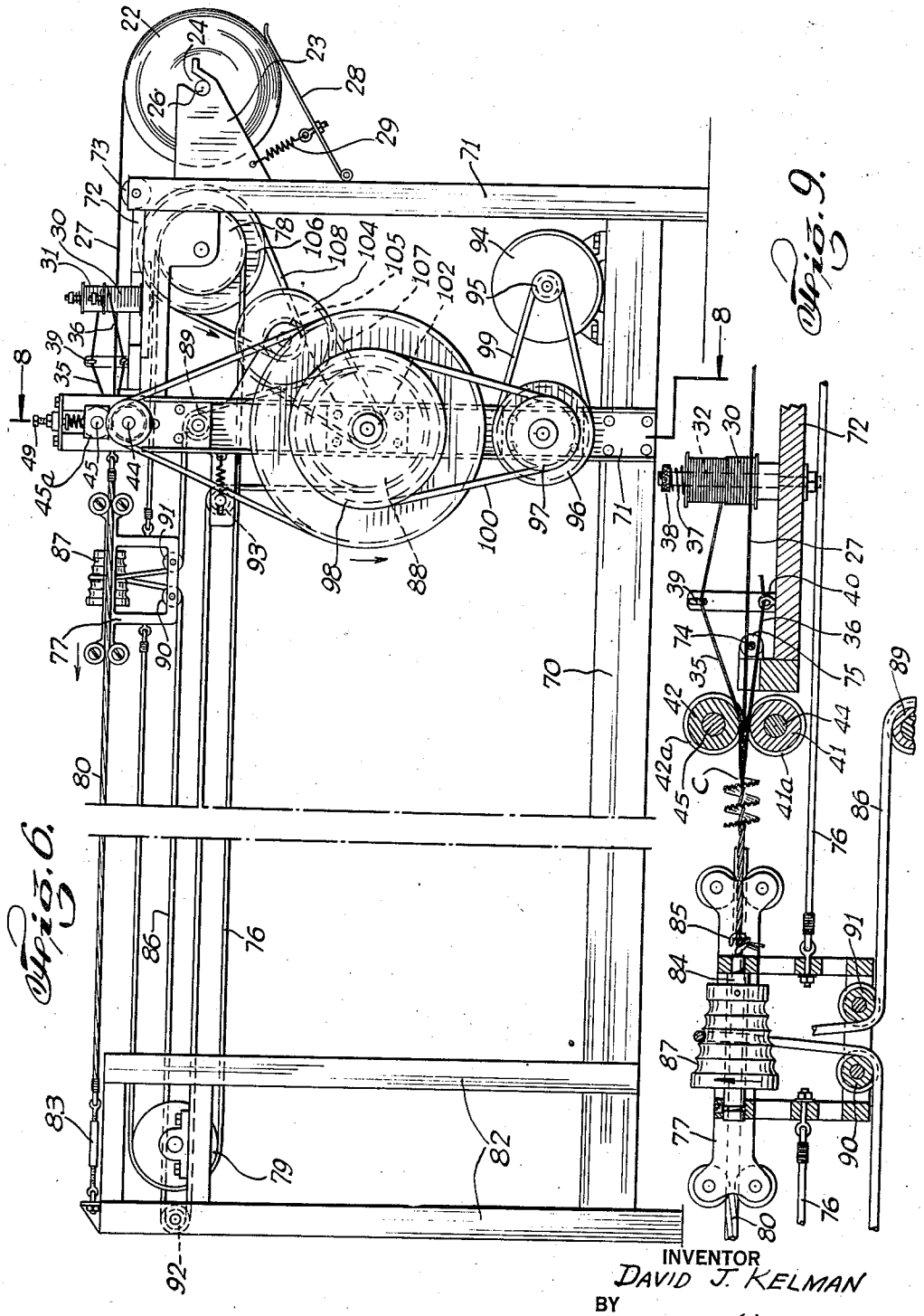


Fig. 9.

Fig. 6.

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APPARATUS FOR MAKING ORNAMENTAL ARTICLES

Filed Aug. 18, 1939 3 Sheets-Sheet 3

Fig. 8.

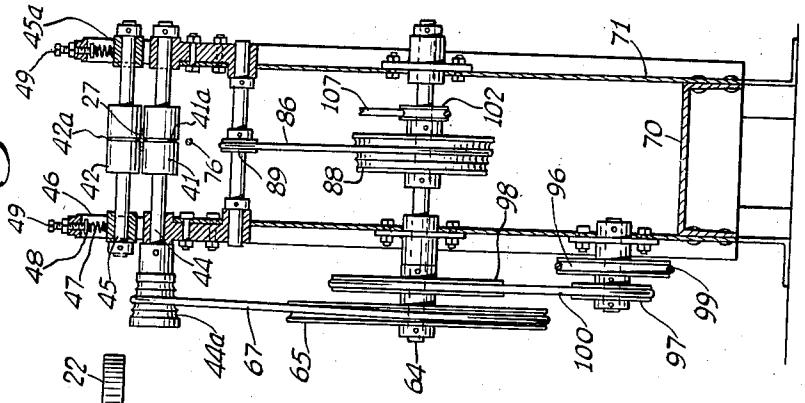


Fig. 7.

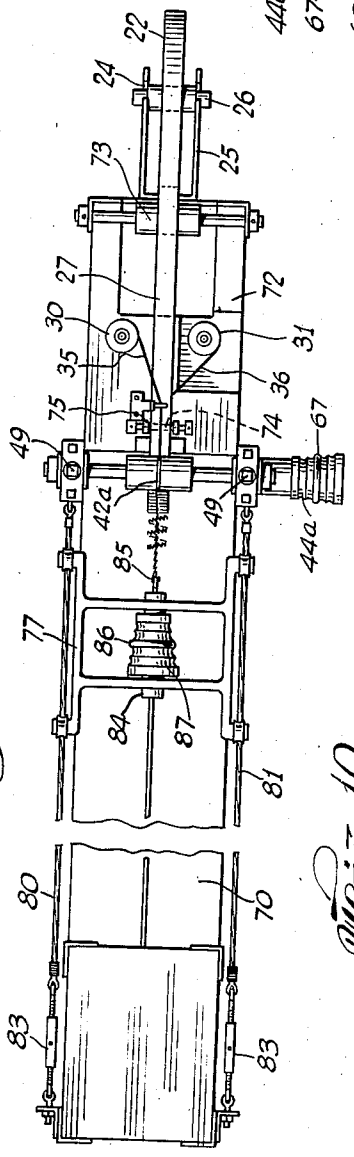


Fig. 10.

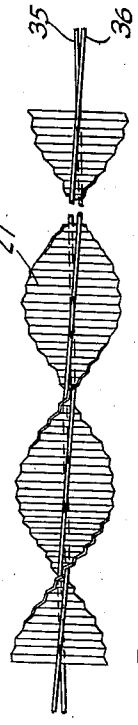


Fig. 11.

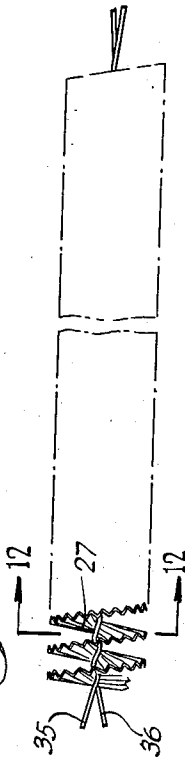
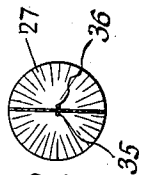


Fig. 12.



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Patented July 8, 1941 2,248,572

UNITED STATES PATENT OFFICE

2,248,572

APPARATUS FOR MAKING ORNAMENTAL ARTICLES

David J. Kelman, Brooklyn, N. Y.

Application August 18, 1939, Serial No. 290,734

21 Claims. (Cl. 41—1)

This invention relates generally to decorative ornaments. It is particularly directed to the provision of apparatus for making decorative ornaments of the shirred, convoluted type.

Among the objects of the invention is to provide apparatus of the character described which shall be rugged in construction, easy to operate, comparatively inexpensive and practical to a high degree.

A further object of this invention is to provide in an apparatus of the character described, novel means for feeding a strip and a pair of core members whereby the strip will become automatically shirred before the twisting operation.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the claims.

Certain features shown and described but not claimed in this application are shown, described and claimed in my co-pending application Serial No. 192,772, filed February 26, 1938, for Ornamental articles and method of making same, of which the present application is a continuation-in-part, including subject matter divided from said co-pending application.

In the accompanying drawings, in which are shown various possible embodiments of this invention,

Fig. 1 is a side elevational view, partly in section, of apparatus embodying my invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a cross-sectional view taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged detail view, partly sectional, of a portion of the apparatus shown in Fig. 1;

Fig. 5 is a view similar to Fig. 4 but showing a different portion in section;

Fig. 6 is a side elevational view of a modified form of apparatus embodying my invention;

Fig. 7 is a plan view thereof;

Fig. 8 is a cross-sectional view taken substantially on the line 8—8 of Fig. 6;

Fig. 9 is an enlarged detail sectional view of a portion of the apparatus shown in Fig. 6;

Fig. 10 is a view illustrating a finished shirred, convoluted, decorative article produced by use of my novel apparatus;

Fig. 11 is a view illustrating an article similar to Fig. 10 but having a greater degree of axial twisting; and

Fig. 12 is a cross-sectional view taken substantially on the line 12—12 of Fig. 11.

Referring now in detail to the drawings, there is illustrated apparatus constructed in accordance with this invention for the production of convoluted ornaments of the type shown in Figs. 10, 11 and 12 and comprising a shirred strip of flexible material having continuous unbroken edges and twisted between flexible core members.

In Figs. 1 to 5 there is illustrated one form of apparatus embodying this invention. The said apparatus comprises a table 20 mounted on legs 21. A roll 22 of flexible material such as paper or "Cellophane" may be rotatably mounted in a bracket 23 attached to one end of said table 20. For easy insertion and removal of the roll of paper, upwardly and rearwardly inclined aligned slots 24 are provided in the opposed side walls 25 of the bracket 23. Said slots slidably receive a shaft 26 upon which the roll 22 is wound. If desired, a drag or tension may be imparted to the material as it unwinds from the roll 22 in the form of a strip 27 by any suitable tensioning means such as the brake illustrated in Fig. 1. Said brake may comprise a brake strip 28 pivotally mounted at one end to a table leg 21 and having its free end pressed against the circumference of the roll 22 by a spring 29 tensioned between the brake strip 28 and the bracket 23.

A pair of core strands 35 and 36, preferably made of such material as wire, cord or the like are fed from spools 30 and 31 rotatably mounted on shafts 32 and 33 which in turn are mounted on the table 20. Springs 37 may be disposed under manually adjustable compression between one end of the spools 30 and 31 and nuts 38 threadedly received on the shafts 32 and 33 to brake the unwinding of said spools and maintain the core members 35 and 36 under tension.

The core members unwound from the spools 30 and 31 are led through a pair of spaced eyes 39 and 40 and then between a pair of suitably mounted adjustable tension feed rollers 41 and 42. The latter have circumferential grooves 41*a* and 42*a*, respectively, which are made sufficiently deep to receive the core members 35 and 36 therein so that they may freely pass between said rollers 41 and 42. The eyes 39 and 40 are so positioned with respect to the tension feed rollers 41 and 42 and the path of travel of the strip 27 of flexible material from its roll 22 to the feed rollers 41 and 42, as to provide a space between the core members 35 and 36. This permits the positioning of said strip 27 between said core members in such manner that one core member, such as 35,

is adjacent one side of said strip 27 while the other core member, 36, is on the opposite side of said strip, as the latter and the core members are passed between the rollers 41 and 42.

The rollers 41 and 42 may be mounted between a pair of posts 43 disposed on opposite sides of the table 20 and extending above and below the same. A shaft 44 journalled in said posts 43 carries the lower or driving roller 41 for rotation therewith. The roller 41 may be belt driven through a step pulley 44a on one projecting end of the shaft 44. The upper or idling feed roller 42 is carried on a shaft 45 having its opposite ends journalled in bearing blocks 45a slidably mounted in vertical slots 46 at the upper ends of the posts 43. The tension between the rolls 41 and 42 may be varied by compression springs 47 between the upper surface of the bearing blocks 45 and a disc 48 at the lower end of adjusting nuts 49.

Means is provided for causing the core members 35 and 36 to unwind from the spools 30 and 31 and pass between the rollers 41 and 42. Such means may comprise an elongated threaded shaft 50 having a keyway 51, and journalled in fixed brackets 52. Fixedly supported in said brackets 52 is a pair of rod members 53 disposed at spaced distances from and parallel to the shaft 50. A spinner frame 54 supported on the shaft 50 and rods 53 is adapted to slidably engage said rods 53 in the circular bearing 55 and arcuate bearing 56. Said spinner frame 54 is also provided with a threaded bore 50a into which the correspondingly threaded shaft 50 is inserted. Thus, upon rotation of the shaft 50, the spinner frame 54 will be caused to move due to the threaded bore 50a and will slide freely on the shafts 53. Any suitable means such as a step pulley 57 at one end of the threaded shaft 50 may be employed for rotating the latter. Rotatably mounted on the spinner frame 54 is a spinner shaft 58 to which the ends of the core members 35 and 36 are fixedly attached.

Means is provided for twisting the core members 35 and 36 as they emerge through the rollers 41 and 42 so that the strip of material 27 which is simultaneously fed between said core members may be also twisted therebetween to form a convoluted ornament of the type shown in Figs. 10, 11 and 12. This may comprise, for example, a separate pulley member 59 journalled in the spinner frame 54 and provided with a hub portion 60 and freely received on the threaded shaft 50. The pulley hub 60 is also provided with a key 61 permanently fixed thereto and adapted to ride in the keyway 51 of the shaft 50. Mounted on the spinner shaft 58 for rotation therewith is a pulley 62. The pulley 59 drives the pulley 62 by means of an interconnecting belt 63.

Any suitable well known means (not shown) may be employed to rotate a power shaft 64 having a pair of pulleys 65 and 66 mounted thereon. The pulley 65 is connected to the stepped pulley 44a, and the pulley 66 to the stepped pulley 57 by belts 67 and 68, respectively.

In setting up the apparatus preparatory to making a shirred and convoluted ornament, the strip of material 27 is passed between the rollers 41 and 42. Each core member 35 and 36 is threaded through its eye 39, 40 and then through the grooves 41a and 42a so that the core members are disposed on opposite faces of the strip 27. The core members may next be slightly twisted and fixedly attached to the spinner shaft 58. When the power shaft 64 is then caused to rotate, the tension feed rollers 41 and 42 will be actuated to feed the strip of material 27 toward the spinner shaft 58 at a relatively high speed. At the same time the shaft 50 will be rotated by the stepped pulley 57, pulley 66 and belt 68, thus causing the spinner frame 54 to retract from the tension rollers 41 and 42 at a relatively low speed compared to the rate of feed of the strip 27 and pull the core members 35 and 36 between the said rollers 41 and 42, through the grooves 41a and 42a, independently of the roller speed. When the shaft 50 is rotated so as to retract the spinner frame 54, the pulley 59 will be caused to rotate with said shaft 50 because the key 61 is engaged in the keyway 51 and at the same time is free to slidably move along the shaft 50 with the spinner frame 54. The rotation of the pulley 59 will cause the pulley 62 to rotate by means of the belt 63. Therefore, as the spinner frame 54 is being slidably moved away from the feed rollers 41 and 42 to exert a pulling force on the core members 35 and 36, the latter will at the same time be axially twisted due to the rotation of the pulley 62 and spinner shaft 58.

It will thus be seen that the strip 27 is fed by the tension rollers 41 and 42 between the core members 35 and 36; and that immediately said strip 27 emerges from said rollers 41 and 42, it is shirred against the point of convergence C (Fig. 2) or end of the twisted portion of the core members 35 and 36 adjacent the rollers 41 and 42 due to the relatively high speed of feed of said strip as aforesaid, and is twisted between the said core members to form a shirred and convoluted ornament in the nature of that shown in Figs. 10, 11 and 12.

If desired, the rollers 41 and 42 may be corrugated on opposite sides of the grooves 41a and 42 so that the strip 27 will be corrugated or crimped as it passes between the rollers.

According to the materials used for the strip 27 and the core members 35 and 36 and the degree of shirring and twisting desired, changes may be made in the relative speeds of feeding the strip 27, retracting the spinner frame 54 and rotating the spinner shaft 58. Thus, the speed of strip feed may be altered by shifting the belt 67 on the stepped pulley 44a; the speed of rotation of the spinner shaft 58 may be altered by using pulleys 62 of different diameters; and the speed of retraction of the spinner frame 54 and of rotation of the spinner shaft 58 may both be changed by shifting the belt 68 on the stepped pulley 57. Fig. 11 illustrates the result of a substantial increase in the speed of rotation of the spinner shaft 58 over that employed to make an ornament such as shown in Fig. 10.

Referring now to Figs. 6, 7, 8 and 9, a modified form of apparatus embodying my invention is illustrated wherein a different type of retracting spinner mechanism is employed. Said modification comprises a platform 70 having at one end thereof a group of standards 71 and table 72 for supporting the core spools 30 and 31, the roll 22 of flexible material, the eyes 39 and 40 and the tension feed rollers 41 and 42, all like those shown in and described with reference to Figs. 1 and 2. Suitable means are provided for maintaining the strip 27 of flexible material in a fixed path after it is unwound from the roll 22. For this purpose, I mount a freely rotatable roller 73 between the standards 71 adjacent the roll 22 so that as the diameter of the roll 22 decreases, the path of the strip 27 over the table 72 will not be angularly changed. To prevent lateral displacement of the strip 27 relative to the rollers 41 and 42, I employ

a rod 74 having a pair of collars 75 adjustably mounted thereon and spaced apart a distance slightly greater than the width of the strip 27. If desired, the upper surface of the rod 74 may be slightly above the horizontal plane between the rollers 41 and 42 to steady the strip 27 before it is fed into said rollers.

In this modification, other means is shown than that shown and described in connection with Figs. 1 to 5, inclusive, for causing the core members 35 and 36 to be unwound from their spools 30 and 31 and passed between the rollers 41 and 42. Such means may comprise a cable power transmission system including a driving cable 76 attached to a spinner frame 77. The cable 76 may pass over a power pulley 78 and idler pulley 79 disposed at opposite ends of the platform 70. The spinner frame 77 may be slidably supported on a pair of cables 80 and 81 strung between standards 71 and 82. Turnbuckles 83 may also be provided for tightening said supporting cables 80 and 81. One of said pulleys 78 and 79, as for example the idler pulley 79, may be adjustably mounted so as to take up any slack in the driving cable 76. Journalled in the spinner frame 77 is a spinner shaft 84 having a hook 85 to which the ends of the core members 35 and 36 are fixedly attached.

Means including another cable power transmission system is provided for twisting the core members 35 and 36 as they emerge through the rollers 41 and 42. Such means may comprise an endless cable 86 which passes over a stepped spinner pulley 87 mounted on the spinner shaft 84. The pulley system over which said cable 86 passes may include the stepped power pulley 88, idler pulley 89 mounted on the standards 71, idler pulleys 90 and 91 mounted on the spinner frame 77, stepped spinner pulley 87, idler pulley 92 mounted on the standards 82 and spring mounted belt take up pulley 93.

Power may be supplied to the apparatus by a motor 94 mounted on the platform 70 and adapted to actuate drive shaft 64 through a series of speed reducing pulleys 95, 96, 97 and 98 interconnected by cables 99 and 100. From drive shaft 64 power may be suitably transmitted to the various cable transmission systems and tension feed rollers 41 and 42. For this purpose, there are provided three drive pulleys 65, 88 and 102, (see Fig. 8) mounted on said shaft 64 and adapted to respectively actuate the cable 67 and the step pulley 44*a* which drives the lower tension feed roller 41, the endless cable 86 and stepped spinner pulley 87 which twists the core members 35 and 36, and the power pulley 78 in the cable transmission systems for drawing the core members 35 and 36 through the rollers 41 and 42. Said power pulley 78 is actuated from its drive shaft pulley 102 through a series of speed reducing pulleys 104, 105 and 106 interconnected by cables 107 and 108, so that the speed at which the spinner frame 77 and core members 35 and 36 are retracted from the rollers 41 and 42 is considerably less than the speed at which the strip of material 27 is fed between the rollers 41 and 42 and is also less than the speed at which the endless cable 86 moves.

In the operation of this form of my invention, the strip 27 of flexible material is pulled by the tension feed rollers 41 and 42 from the roll 22 over the positioning roller 73 and through the guide and steadying rod 74 and collars 75.

The core members 35 and 36, disposed on opposite sides of the strip 27, are pulled through said rollers 41 and 42 and then twisted by the retracting rotating spinner hook 85 causing the formation of a core of constantly increasing length after twistingly converging at a point C (Fig. 9) beyond the rollers 41 and 42. The annular grooves 41*a* and 42*a* allow the core members 35 and 36 to pass freely between the rollers 41 and 42 and prevent twisting of said core members until they have passed therethrough. The strip 27 is fed by the tension rollers 41 and 42 between the core members 35 and 36 against said point of convergence C at a rate of speed greater than that at which the core members are retracted from the rollers 41 and 42, thus causing said strip 27 to be shirred against the point of convergence C between the core members 35 and 36. Said strip 27 is then axially twisted between said core members 35 and 36 as hereinabove described, to form a shirred, convoluted ornament.

The speed of strip 27 feed may be altered by shifting the belt 67 on the stepped pulley 44*a*; the speed of rotation of the spinner shaft 84 may be altered by shifting the belt 86 on the stepped pulley 87 or on the stepped pulley 88; and the speed of retraction of the spinner frame 77 may be altered without material alteration in the speed of rotation of the spinner shaft 84 by changing the diameter of any one of the pulleys 102, 104, 105 or 106 in the reducing train.

It will thus be see that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a pair of core strands, the combination of means for supporting said core strands in spaced relationship to each other, means for progressively altering the angular relationship of a portion of said core strands, leaving a portion thereof unaltered, and means for feeding said strip between the said unaltered portion of said core strands and against the altered portion of said core strands.

2. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a pair of core strands, the combination of means for feeding said core strands from a source of supply, means for feeding said flat strip between said strands at a greater speed than the speed at which said core strands are fed, and means for progressively altering the angular relationship of said strands with said strip positioned therebetween.

3. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a pair of core strands, the combination of means for feeding said flat strip, means associated with said last

named means for positioning said core strands on opposite sides of said strip, means for moving said core strands relatively to said strip feeding means, and means for progressively altering the angular relationship of said core strands with said strip positioned therebetween.

4. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges, and wherein said strip is twisted between a pair of core strands, the combination of means for feeding said flat strip, means associated with said last named means for positioning said core strands on opposite sides of said strip, means for moving said core strands relatively to said strip feeding means, and at a lesser speed than the speed at which said strip is fed, and means for progressively altering the angular relationship of said core strands with said strip positioned therebetween.

5. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a pair of core strands, the combination of rollers adapted to feed said strip therebetween, means for causing said core strands to pass freely between said rollers on opposite sides of said strip, said core strands being movable relatively to said rollers, and means for progressively altering the angular relationship of said core strands with said strip positioned therebetween.

6. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a pair of core strands, the combination of a pair of rollers adapted to feed said strip therebetween, circumferential grooves in said rollers for positioning said core strands on opposite sides of said strip, means for moving said core strands relatively to said rollers, and means for progressively altering the angular relationship of said core strands with said strip positioned therebetween.

7. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a pair of core strands, the combination of a pair of rollers adapted to feed said strip therebetween, circumferential grooves in said rollers for positioning said core strands on opposite sides of said strip, means for moving said core strands relatievly to said rollers, means for progressively altering the angular relationship of said core strands with said strip positioned therebetween, and means for varying the ratio of the speed of strip feed to the speed of core strand movement.

8. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges, and wherein said strip is twisted between a pair of core strands, the combination of a pair of rollers adapted to feed said strip therebetween, means comprising circumferential grooves in said rollers for positioning said core strands on opposite sides of said strip, means for moving said core strands at a different rate of speed from that of said rollers, and means for progressively altering the angular relationship of said core strands with said strip positioned therebetween.

9. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a plurality of core said core strands to a point of convergence, sepstrands, the combination of means for feeding arate strip feeding means for pressing said strip between said strands against said point of convergence, and means for progressively altering the angular relationship of said core strands with said strip positioned therebetween.

10. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein strands, the combination of a pair of rollers said strip is twisted between a pair of core adapted to feed said strip therebetween, means comprising circumferential grooves in said rollers for positioning said core strands on opposite sides of said strip, a movable frame, said strands being fixed to said frame for movement therewith, a shaft journalled in said frame, means to move said frame relative to said rollers, and means associated with said last named means to rotate said shaft to thereby cause progressive alteration of the angular relationship of said core strands.

11. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a pair of core strands, the combination of means feeding said core strands from independent sources of supply to a point of convergence, separate strip feeding means for pressing said strip against said point of convergence, the rate of speed of said strip feed being greater than the rate of speed of the feed of said strands to thereby cause the end of said strip to be forced against said point of convergence to cause shirring of the strip portion adjacent to said point of convergence, and means for progressively altering the angular relationship of said strands with said shirred strip portion therebetween.

12. In an apparatus for manufacturing convoluted shirred ornaments of the type described from a flat strip of flexible material having continuous unbroken longitudinal edges and wherein said strip is twisted between a pair of core strands, the combination of a source of supply for said core strands, means to tension said core strands issuing from said source of supply, a source of supply for said strip, means to tension said strip issuing from said last named source of supply, a pair of rollers adapted to feed said strip therebetween, means adjacent said rollers to steady said strip and position the same relative to said rollers, means comprising circumferential grooves in said rollers for positioning said core strands on opposite sides of said strip, a frame, a shaft journalled in said frame, means on said shaft to fixedly attach said core strands thereto, means for rotation therewith to move said frame relative to said rollers, and means to rotate said spinner shaft to cause progressive alteration of the angular relationship of said core strands.

13. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for bringing a pair of

core strands to a point of convergence, and strip feeding means for pressing said strip against said point of convergence.

14. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for bringing a pair of core strands to a point of convergence, and strip feeding means for pressing said strip against said point of convergence, said point of convergence being spaced a short distance from said strip feeding means.

15. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for bringing said core strands from independent sources of supply to a point of convergence, and strip feeding means for pressing said strip against said point of convergence, the rate of speed of said strip feed being greater than the rate of speed of the feeding of said strands.

16. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for bringing said core strands from independent sources of supply to a point of convergence, and a pair of strip feeding rollers for pressing said strip against said point of convergence.

17. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for bringing a pair of core strands to a point of convergence, strip feeding means for pressing said strips against said point of convergence, and means for progressively altering the angular relationship of said strands with said strip positioned therebetween.

18. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for feeding a pair of core strands, means for feeding and shirring said strip between said strands, and means for progressively altering the angular relationship of said strands with said strip positioned therebetween.

19. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for feeding a pair of core strands, means for shirring said flat strip, means for feeding said shirred strip between said strands, and means for progressively altering the angular relationship of said strands with said strip positioned therebetween.

20. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for disposing said strands in spaced proximity, means for shirring said strip, means for disposing said strip between said strands, and means for progressively altering the angular relationship of said strands in the region occupied by said strip.

21. In an apparatus for manufacturing shirred ornaments of the type described from a flat strip of flexible material and wherein said strip is convoluted between a plurality of core strands, the combination of means for causing said strands to converge to a point, means for shirring said flat strip, means for feeding said shirred strip between said core strands towards said point of convergence, and means for progressively altering the angular relationship of said strands in the region occupied by said strip.

DAVID J. KELMAN.

CERTIFICATE OF CORRECTION.

Patent No. 2,248,572. July 8, 1941.

DAVID J. KELMAN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, second column, line 9, claim 9, strike out the words "strands, the combination of means for feeding" and insert the same after "core" in line 7, same claim; line 20, claim 10, strike out the words "said strip is twisted between a pair of core" and insert the same after "wherein" in line 18, same claim; line 66, claim 12, for "thereto, means for rotation therewith" read --thereto for rotation therewith, means--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of December, A. D. 1941.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)