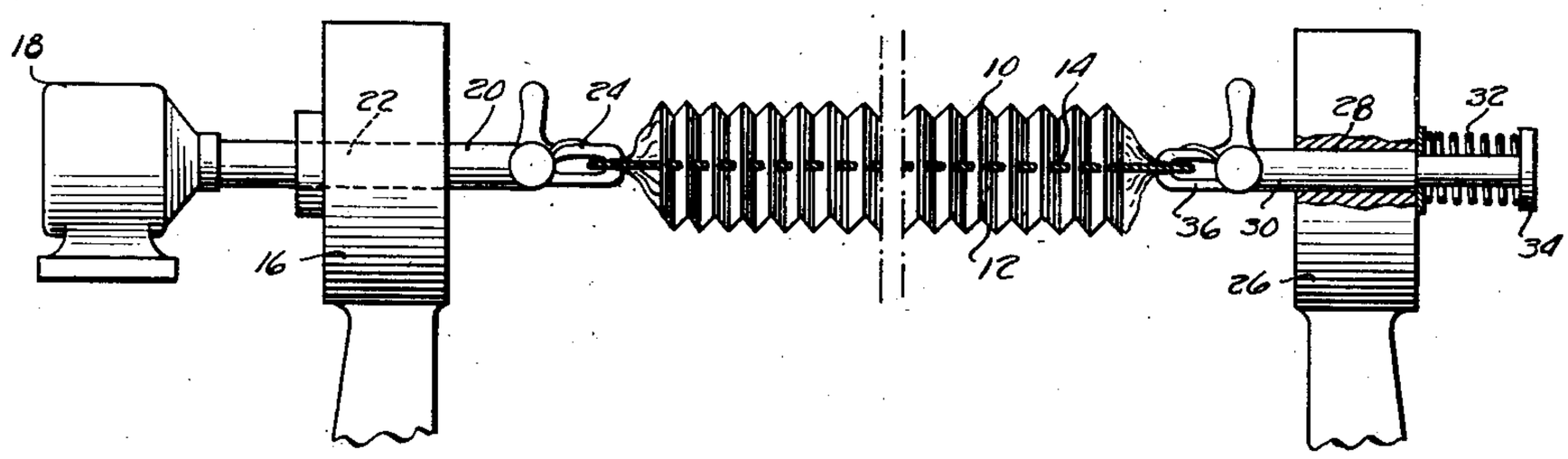
Nov. 15, 1932. V. T. HOEFLICH 1,888,198

METHOD OF MAKING CONVOLUTED ORNAMENTS OF FLEXIBLE MATERIAL

Original Filed April 4, 1928 2 Sheets-Sheet 1

FIG. 1.



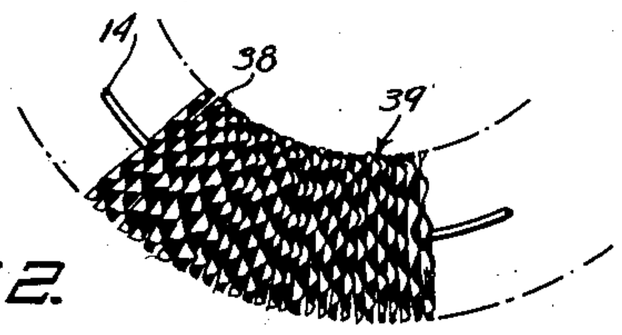


FIG. 2.

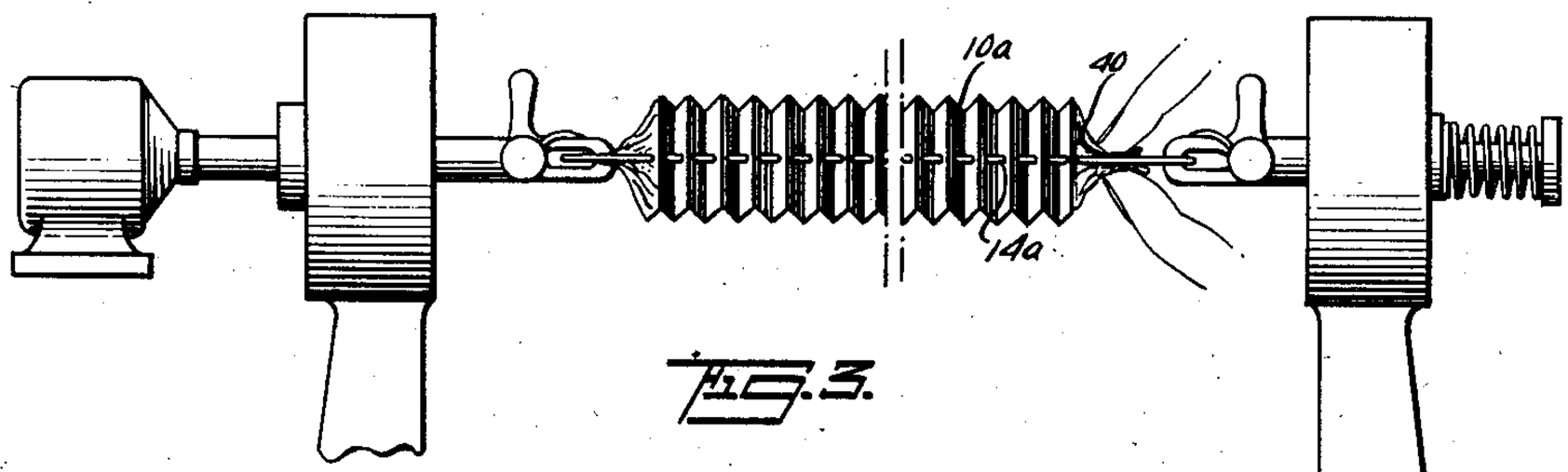


FIG. 3.

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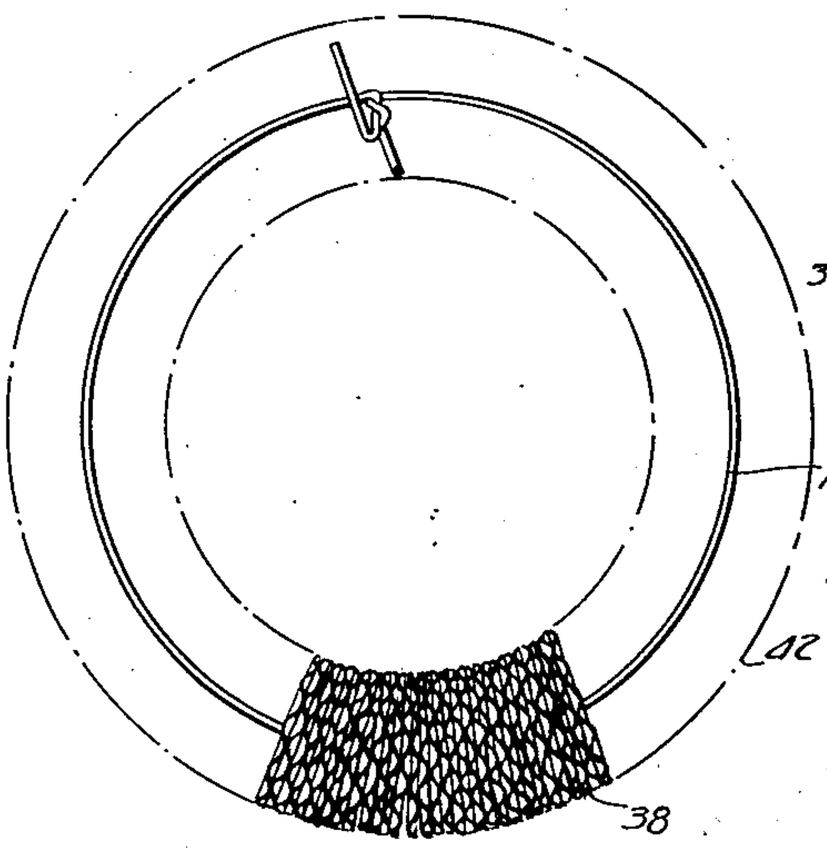


FIG. 4.

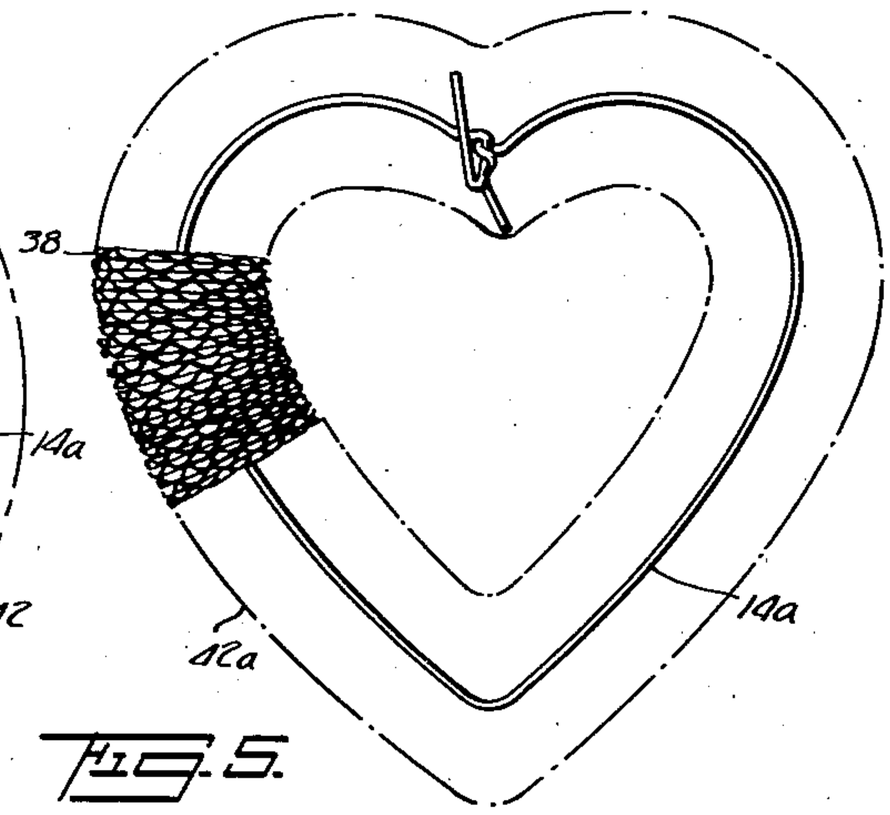


FIG. 5.

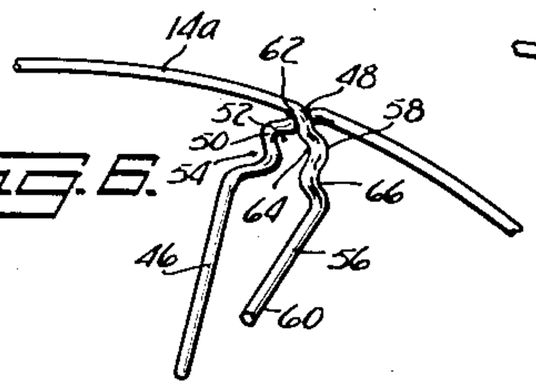


FIG. 6.

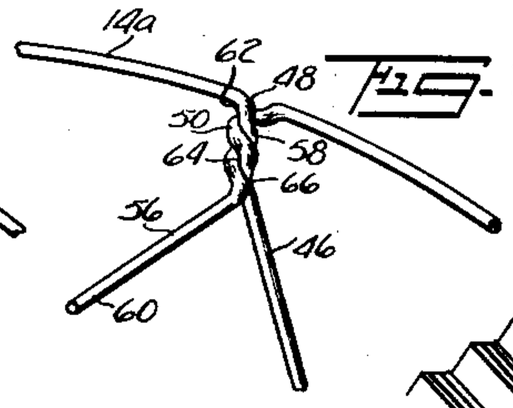


FIG. 7.

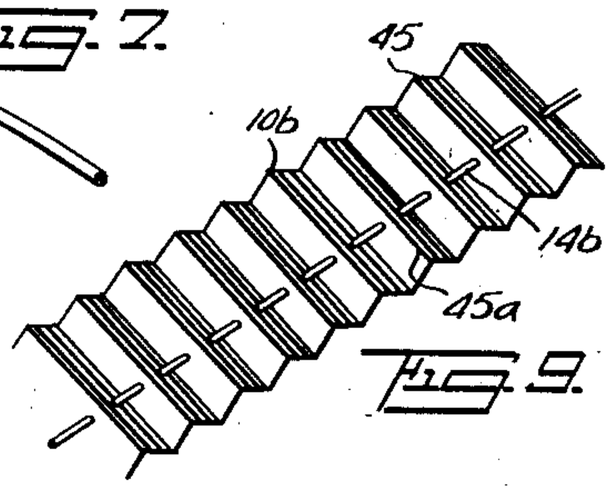


FIG. 9.

FIG. 8.

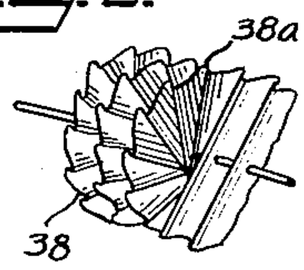
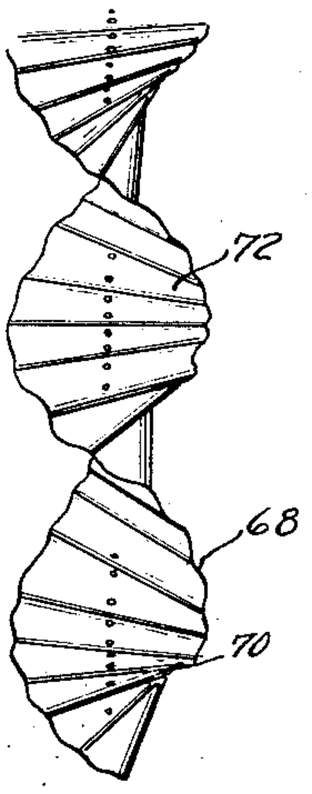


FIG. 11.



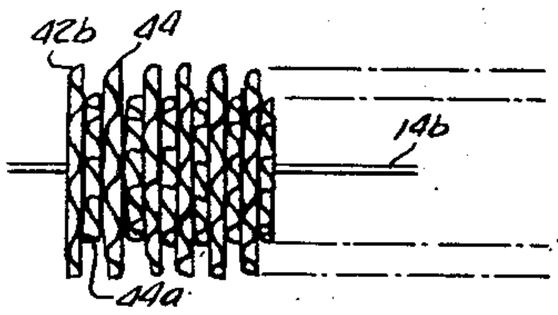


FIG. 10.

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UNITED STATES PATENT OFFICE

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METHOD OF MAKING CONVOLUTED ORNAMENTS OF FLEXIBLE MATERIAL

Original application filed April 4, 1928, Serial No. 267,387. Divided and this application filed May 21, 1929. Serial No. 364,724.

This application is a division of application Serial No. 267,387, filed April 4, 1928.

My invention relates to a method for producing devices, such as merri-leis, streamers, festoons, wreaths, and similar ornaments formed of strips of crepe paper or other flexible material, and employed for ornamenting the person, the room, or other things or places; and the same has for its object more particularly to produce a simple, attractive and durable device which is of uniform and symmetrical appearance, and which is produced at low cost.

Further, said invention has for its object to produce a device of the character specified in which a plaited strip having a core threaded therethrough is twisted to form convolutions of uniform character uniformly distributed along the core, and radially reinforced to retain the same permanently in convoluted form in transverse relation to the core.

Further, said invention has for its object to produce a device of the character specified in which the convolutions thereof project substantially at right angles to the core thereof without being over twisted, and having radially extending folds therein serving to stiffen or reinforce said convolutions to retain the same in extended position, and to resist untwisting thereof.

Further, said invention has for its object to produce a device of the character specified in which the mandrel on which the flexible strip is twisted to form a convoluted or spiral portion constitutes a permanent part of the resulting product, and serves to retain said portion in distended condition conforming to a predetermined shape or configuration.

Further, said invention has for its object to produce a device of the character specified in which the core or mandrel on which the flexible strip is twisted to form a convoluted or spiral portion serves to retain said portion in permanent shape when the same is formed into a wreath or other device of endless configuration.

Further, said invention has for its object to produce a device of the character specified in which the convolutions thereof appear alternately enlarged and constricted providing a staggered arrangement producing a striking ornamental effect.

Further, said invention has for its object to produce a device of the character specified in which the successive convolutions thereof are permanently secured to the core thereof to prevent the same from being displaced thereon.

Further, said invention has for its object to produce a device of the character specified in which the opposite edges of the flexible strip employed are colored or tinted to produce a characteristic spiral colored effect when the strip is twisted.

Further, said invention has for its object to produce a device of the character specified in which the convoluted portion is disposed upon an endless distending member with the contiguous ends of the convoluted portion in close relation to each other.

Further, said invention has for its object to produce a device of the character specified in which the ends of the core thereof may be readily locked together to form a wreath or other device of endless configuration.

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

To the attainment of the aforesaid objects and ends my invention consists in the method, hereinafter more fully described, and then pointed out in the claims.

In the accompanying drawings:

Figure 1 is an elevation showing means for twisting a plaited strip having a thread passed through the folds thereof;

Fig. 2 is an elevation showing the product resulting therefrom;

Fig. 3 is a view illustrating the twisting means employed for twisting a plaited strip having a wire core threaded therethrough;

Fig. 4 is an elevation showing the product resulting therefrom formed into a circular wreath;

Fig. 5 is a view similar to Fig. 4 showing said product formed into a heart-shaped device;

Fig. 6 is an enlarged detail view of means for locking the ends of the wire core together, the same being shown disconnected;

Fig. 7 is another detail view of said locking

means showing the same in locking position;

Fig. 8 is a perspective of the convoluted portion, the same being shown in expanded position;

Fig. 9 is a perspective showing the thread or wire constituting the core disposed in offset relation to the medial line of the plaited strip;

Fig. 10 is an elevation showing the product resulting from the twisting thereof; and

Fig. 11 is an elevation showing the article obtained by removing the string or core from the convoluted portion.

In practicing my method a strip 10 (or two or more super-imposed strips) of crepe paper or other flexible material (Fig. 1) are crimped or plaited, as indicated at 12, and a thread 14 is run longitudinally through the folds thereof like a running stitch. This operation is preferably performed by means of a suitable machine, although the same may be performed by hand, if so desired.

In my method I effect the twisting of the strip or strips, or portion thereof, either by reducing the frictional resistance between the core 14 and the strip 10, or by employing the core 14 to assist in twisting the strip by rotating the core during the twisting operation, or both. The rotation of the core also reduces the frictional resistance, because the relative movement between the core and the twisting strip is then less. Further, the untwisted strip 10 is so flexible that the twisting power cannot be readily transmitted from end to end thereof until said strip becomes sufficiently twisted to offer torsional resistance to the twisting, and hence to transmit the twisting power to the more remote portions thereof. The less the core resistance, the more readily the twisting is transmitted through he strip itself to the more remote portions thereof.

In order to reduce the frictional resistance between the strip 10 and the core 14, the needle used to perforate the strip 10 is preferably made larger than the thread or wire used so that the latter passes more readily through the perforations formed. I have also discovered that the twisting may be more readily accomplished by impregnating the strip 10 about the perforations therein with minute quantities of oil, such as machine oil, or other liquid or solid lubricators, such as, for instance, carbon tetrachloride, it being preferable that substances, such as water, tending to destroy or modify the characteristics or qualities of the paper or flexible material, be not employed.

When the flexible strip is plaited and threaded, or during the plaiting and threading operation itself, the twisting operation is performed. For effecting the twisting, the thread or core, and the operation is the same for all kinds of cores such as those herein described, is supported or secured at the ends, or at spaced points thereof substantially taut. The plaited strip 10, or a portion thereof, disposed upon the core in untwisted condition, between the supports itself, is then held relatively stationary at one end or portion thereof and power is applied at a remote point thereof to twist the same about the core as a mandrel. As described above the core may be simultaneously rotated to reduce the frictional resistance and to assist in transmitting the twisting power to the more remote portions of the strip, or in some cases, the core may be retained stationary and the strip, or a portion thereof, twisted thereon, the use of oil or relatively attenuated cores, or both, being relied upon to reduce the frictional resistance, if required, and to permit of the convolutions more readily sliding along the core to more uniformly distribute the convolutions along the core.

In one method, the plaited strip 10 with the core 14 threaded therein is clamped at both ends in the twisting apparatus shown at Fig. 1. This apparatus comprises a suitable pedestal 16 having an electric motor 18 mounted thereon. The motor shaft 20 extends through a bearing 22, and is provided at the inner end thereof with a pair of clamping jaws 24. Another pedestal 26 disposed in spaced relation to the pedestal 16 has a bearing 28 in axial alignment with the bearing 22. A shaft 30 is rotatably disposed within the bearing 28, and is also axially movable therein. A spring 32 is coiled about a shaft 30 intermediate the bearing 28 and an abutment 34 upon the outer end of said shaft 30 to normally retain the same in retracted position. The inner end of the shaft 30 is also provided with clamping jaws 36. The bearings 22 and 28 are preferably provided with the usual anti-friction devices or ball-bearings.

In order to twist the partially formed, threaded, plaited strip 10 employing a fibrous thread 14, having a plurality of strands as shown at Fig. 1, the ends of the thread 14 and the ends of the strip 10 are secured in position by the clamping jaws 24 and 36. The motor 18 is then rotated at a relatively high speed in a direction tending to unwind the strands of the thread 14, whereby, as the twisting operation continues, the thread becomes untwisted and elongated, and the strip 10 becomes twisted thereon substantially as shown at Fig. 2 without becoming contracted in length.

Inasmuch as the thread 14 is flexible the shaft 30 remains stationary during the twisting operation, although the thread rotates in the direction of the twisting movement because of its flexibility at the remote end thereof. Hence the strip 10 is rapidly twisted into completed form from the rotating end thereof to the stationary end thereof, the rotation of the thread reducing the fric-

tion, and serving to transmit the twisting power to the more remote portions of the strip 10. The operator by sliding the hand over the convolutions 38 of the twisted article can distribute the same uniformly upon the thread or string 14, producing the article or device 39 substantially as shown at Fig. 2.

By rapidly and continuously rotating the plaited and threaded strip 10 from one end, while retaining the opposite end of the strip relatively stationary, I am permitted to employ unusually long integral strips. The twisting power is applied at the end of the strip remote from the stationary end thereof, and the operation is accomplished very rapidly and effectively.

As the twisting operation continues the torsional resistance of the strip 10 increases to the point that sufficient power from the motor 18 is transmitted to the shaft 30 to cause the same to rotate. This prevents the article from being twisted too much and serves as a safety device to insure the production of an article in which the convolutions 38 thereof project outwardly at substantially right angles to the core. These convolutions are provided with radiating folds 38ª (Fig. 8), serving to maintain the convolutions permanently in twisted condition and to resist the untwisting thereof, and constituting reinforcing portions adapted to maintain the convolutions relatively stiff or rigid. These folds 38ª at the outer edges of the convolutions form a device having a honey-combed or wavy appearance.

At Fig. 3 a resilient deformable member 14ª, such as a wire, is shown threaded through the plaited strip 10ª. The core 14ª is of a material which may be readily deformed or bent into circular, or other form, the same constituting a distending member which is sufficiently resilient to maintain the device in the desired shape.

My method of twisting the flexible strip 10ª on the wire 14ª is as follows:

Both the wire 14ª and the strip 10ª are secured by the jaws 24 at the motor end of the device as illustrated at Fig. 3, and the wire 14ª only is secured at the opposite end thereof by the jaws of the rotatable shaft 30. When the motor 18 is running the rotation of the wire 14ª at one end is transmitted to the other end of the wire, because of the torsional resistance thereof, resulting in the rotation of the shaft 30 and in the rotation of the wire as a whole. By holding the free end of the plaited strip 10ª stationary as illustrated at 40, against movement with the wire 14ª, the plaited material is rapidly twisted from one end thereof to the other, the wire 14ª serving as a mandrel upon which the material is twisted.

In the last method given as an example, the wire 14ª continuously rotates, without being twisted, in the same direction that the strip 10ª is to be twisted. At the motor end of the strip 10ª the resistance is less than at the stationary end because the difference in speed between the core and strip is greater at the stationary end 40 of the strip 10ª. Hence the power applied to the wire 14ª is first transmitted to the portion of the strip 10ª adjacent to the stationary end thereof to effect the twisting of said relatively stationary portion forming the convolutions therein, and, as the torsional resistance of this portion increases due to the formation of said convolutions the strip progressively becomes twisted towards the motor end thereof.

This method permits of the production of articles of convoluted cylindrical formation with cores 14ª which are deformable and bendable, and which ultimately serve to retain the completed devices in distended condition conforming to a predetermined configuration or shape. For instance, such devices may be readily bent or deformed to provide a circular wreath 42 as illustrated at Fig. 4, or the same may be permanently deformed into other shapes, such as a heart-shaped device 42ª illustrated at Fig. 5.

The endless devices 42 and 42ª, illustrated as examples at Figs. 4 and 5, consists of the deformed or bent member or wire 14ª about which is disposed the strip 10ª twisted into a plurality of successive convolutions or spirals 38 uniformly distributed thereover, like the product shown at Figs. 2 and 8, said devices being of permanent shape or configuration.

At Figs. 9 and 10 is illustrated a modified form of the device in which the core 14ᵇ, either a thread or wire, is strung or threaded through the successive folds of the plaited strip 10ᵇ in off-set relation to the medial line of the strip. The twisting operation is performed in the manner above described, the method being varied, depending on whether a wire or thread is employed. The resulting product 42ᵇ consists of successive convolutions or spirals 44 and 44ª, which project outwardly and appear alternately enlarged and constricted as illustrated at Fig. 10, forming a staggered arrangement producing a characteristic effect.

The durability of the device and the permanency in the uniformity of the distribution of the convolutions 38 over the cores 14, 14ª, 14ᵇ may be enhanced by securing the convolutions permanently to the core, preferably by a suitable adhesive material, such as glue.

For this purpose the cores 14, 14ª, 14ᵇ, as desired, are coated or treated with an adhesive which is normally hard, and which softens upon the application of a liquid or heat thereto, or both. When the strip 10, 10ª, 10ᵇ is twisted and uniformly distributed over the core thereof, the glue or other adhesive is softened, such as by the application of steam thereto. When the adhesive again hardens the convolutions 38 become perma-

nently attached to the core against displacement thereon.

Striking color effects can also be obtained by tinting one edge 45 of the strip, such as the strip 10^b at Fig. 9, with one color and the opposite edge 45^a with another color.

When the strip 10^b is twisted an alternating spiral colored effect is produced, consisting of alternate spirals of different colors.

For readily securing or locking the ends of the wreaths or endless devices 42, 42^a together one end of the wire core 14^a (Figs. 6 and 7) is permanently bent or pre-formed to provide an end portion 46, extending at approximately an acute or sharp angle to the main portion of the wire and provided with a relatively shallow centering recess 48 at the outer side of the base thereof substantially at the bend. The inner part 50 of the portion 46 is a reverse curve having an inner notch 52 contiguous to the recess 48 and an outer notch 54. When the ends of the wire 14^a are locked together the portion 46 lies substantially in the plane of the wire loop formed, and projects inwardly.

The opposite end of the wire core 14^a is likewise permanently bent or pre-formed to provide an angular end portion 56 consisting of an inner reverse curve portion 58 extending inwardly along a line substantially in the plane of the wire loop formed when the ends thereof are secured together, and an outer portion 60 extending transversely of the plane of said loop substantially at an angle to the portion 58. The portion 58, which lies in a plane substantially at right angles to the plane of the part 50, has a relatively shallow centering recess 62 at the inner side of the base thereof adapted to engage the centering recess 48, and the oppositely directed notches 64 and 66 adapted to engage the notches 52 and 54.

In order to lock the parts together the centering recess 62 is disposed within the centering recess 48. The portion 60, which is slightly shorter than the portion 46 is sprung or passed back of the latter, and the portions 46 and 60 twisted or rotated in opposite directions until the notch 64 engages the notch 52 and the notch 66 engages the notch 54, the parts snapping into position because of the inherent resiliency of the wire, and being securely locked therein against being accidently disengaged. The wire can be readily unlocked or released by pressing the end portions 46 and 60 in opposite directions.

It is to be noted that the ends of the wire 14^a are locked along a line extending transversely of the circumference of the wreath, so that the convoluted strip at the ends thereof may be permitted to substantially abut without leaving a space therebetween. The end portions 46 and 60, or either thereof, may, if so desired, serve for the attachment of greeting cards, streamers, embellishments, or other devices thereto, or as attaching means for supporting the wreath or device itself.

At Fig. 11 is shown a convoluted strip 68 which is produced by the methods hereindescribed. The strip 68 is originally plaited, threaded and twisted as described above, and as illustrated at Figs. 1 and 2. The thread is then withdrawn releasing the convolutions which assume an elongated permanently spiral shape, as illustrated at 70, Fig. 11, having the transverse creases or folds 72 therein. The device 68 is attractive, being particularly adapted for use as a streamer, or the like, and the same is longitudinally resilient like a coil spring. When an impulse is imparted thereto, the same vibrates spirally and longitudinally, alternately elongating and contracting, to produce a novel effect.

By my invention, convoluted devices are produced in which the successive convolutions thereof are well formed and uniformly distributed along the wire or thread, and project outwardly at substantially right angles to the core, the convolutions being comparatively stiff or rigid, providing an attractive and highly ornamental device.

Further, by my invention articles of twisted or convoluted flexible material are produced in which the convoluted portion is maintained in different predetermined, permanent shapes or configurations, such as in the form of wreaths and the like, by the core about which the flexible portion is twisted.

I claim:

1. The hereindescribed method which consists in taking a plaited strip of flexible material having a core member threaded through the folds thereof, supporting said core member in comparatively taut condition, and twisting said strip thereon while retaining said strip against twisting movement at a point in spaced relation to the point of application of the twisting power thereto.

2. The hereindescribed method which consists in taking a plaited strip of flexible material having a core member threaded through the folds thereof, reducing the frictional resistance between the core member and the strip, supporting said core member in comparatively taut condition, and twisting said strip thereon while retaining said strip against twisting movement at a point in spaced relation to the point of application of the twisting power thereto.

3. The hereindescribed method which consists in plaiting a strip of flexible material and running a core member through the folds thereof, supporting said core member in relatively taut condition, retaining said strip against twisting movement at one point thereof, applying twisting power thereto at another point thereof, and reducing the frictional resistance between the core and strip to facilitate the twisting operation.

4. The hereindescribed method which con-

sists in plaiting a strip of flexible material and running a core member through the folds thereof, supporting said core member in comparatively taut condition, rotating said core member while securing said strip at one point thereof for rotation with said core member and at another point holding the same against rotation with said core member.

5. The hereindescribed method which consists in plaiting and perforating a strip of flexible material, running a relatively smaller core member through said perforations, applying a lubricating substance to said strip about said perforations, supporting said core member in comparatively taut condition, and twisting said strip thereon by applying power thereto at one point while retaining a portion of said strip in spaced relation thereto against twisting movement.

6. The hereindescribed method which consists in plaiting a strip of flexible material and running a core member through the folds thereof, supporting said core member at spaced points thereof in comparatively taut condition, retaining said strip at one point thereof against twisting movement with said core member and at another point thereof for rotation with said core member, and rotating said core member, whereby to effect the twisting of said strip in part by the action of said core member.

7. The hereindescribed method which consists in taking a plaited strip of flexible material having a core member threaded through the folds thereof, retaining said strip against twisting movement at one end thereof, and rotating said strip by applying power to the other end thereof, whereby to form a twisted device composed of successive spiral convolutions disposed about said core member.

8. The hereindescribed method which consists in taking a plaited strip of flexible material having a core member threaded through the folds thereof, supporting said core member, retaining said strip against twisting movement at one point thereof, and continuously rotating said strip upon said core member at relatively high speed by applying power at another point thereof, whereby to produce a twisted device composed of successive spiral convolutions disposed about said core member.

9. The hereindescribed method which consists in taking a plaited strip of flexible material having a core member threaded through the folds thereof, securing said core member and said strip at certain of the contiguous ends thereof to a revolvable member, and suitably supporting the same at the opposite contiguous ends thereof, and rotating said revolvable member while retaining the portion of said strip in spaced relation thereto against twisting movement.

10. The hereindescribed method which consists in plaiting a strip of flexible material and threading through the folds thereof a core member capable of maintaining the completed product in distended condition conforming to a predetermined shape, supporting said core member at points in spaced relation, and rotating said strip on said core member by applying power to one end of the strip while retaining the portion of said strip in spaced relation thereto against twisting movement.

11. The hereindescribed method which consists in plaiting a strip of flexible material and threading a wire through the folds thereof, supporting said wire at spaced points thereof, and twisting said strip upon said wire as a mandrel by applying power to said strip at one end thereof while retaining the said strip at another point against twisting movement.

12. The hereindescribed method which consists in plaiting a strip of flexible material and threading a wire through the folds thereof, supporting said wire at spaced points thereof and at one point by a revolvable support and securing said strip at one point thereof to said revolvable support, and rotating said support and said wire to twist said strip thereon while retaining said strip at a point in spaced relation to the first mentioned point thereof against twisting movement.

13. The hereindescribed method which consists in plaiting a strip of flexible material and passing a core member having a normally inactive adhesive property through the folds thereof, twisting said strip on said core to form convolutions along the same, and rendering said core member adhesive, whereby to secure said convolutions in fixed position along said core member.

14. The hereindescribed method which consists in taking a strip of flexible material, tinting the edges thereof differently from the central portion thereof, and plaiting said strip and running a core member through the folds thereof, and then twisting said strip on said core member to form a convoluted portion presenting a characteristic color effect.

15. The hereindescribed method which consists in plaiting a strip of flexible material and threading a distending member through the folds thereof, supporting said distending member in comparatively taut condition, and rotating said distending member while securing said strip at one point thereof for rotation with said distending member and retaining said strip at another point thereof against twisting movement with said distending member.

16. The hereindescribed method which consists in plaiting a strip of flexible material and threading through the folds thereof a core member capable of maintaining the completed product in distended condition

conforming to a predetermined shape, supporting said core member in comparatively taut condition, imparting a twisting movement to said strip at one point thereof about said core member as a mandrel while retaining said strip at another point thereof against twisting movement, and shaping said core member with the twisted strip thereon to form a device conforming to said predetermined shape.

17. The hereindescribed method which consists in plaiting a strip of flexible material and threading a deformable wire through the folds thereof, securing said wire and said strip at certain of the contiguous ends thereof to a revolvable support, securing the opposite end of said wire to another revolvable support, rotating said first named support while retaining the opposite end of said strip against twisting movement, and forming a convoluted twisted strip portion about said wire as a mandrel, deforming said wire into a desired shape, and connecting the ends of said wire together.

18. The hereindescribed method which consists in plaiting a strip of flexible material, threading a core member through the folds thereof in off-set relation to the medial line of the strip, and twisting said strip, whereby to form about said core member a series of alternately enlarged and constricted spiral convolutions.

19. The hereindescribed method which consist in plaiting a strip of flexible material, running a thread through the folds thereof, supporting the thread at spaced points thereof in comparatively taut condition, and twisting said strip and thread at one end in a direction to unwind the strands of the thread while holding said strip at a point spaced therefrom against twisting movement.

20. The hereindescribed method which consists in plaiting a strip of flexible material, threading a wire core through the folds thereof, rotatably supporting said wire at spaced points thereof in extended condition, and mechanically rotating said core while securing said strip at one point thereof for rotation with the core and retaining said strip at another point thereof against rotation with the core, whereby to impart a permanent twist to the strip and produce a convoluted structure.

In testimony whereof, I have signed my name hereto.

VICTOR T. HOEFLICH.