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Nimmo, Jr. et al.

[11] **3,922,407**

[45] **Nov. 25, 1975**

[54] **CIRCULAR GENERATING POMPON BOW STRUCTURE**

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[21] Appl. No.: **23,144**

[52] **U.S. Cl.** **428/5**; 2/244; 223/46

[51] **Int. Cl.**[2] **D04D 7/10**

[58] **Field of Search** 161/9, 10, 86, 110, 117, 161/149; 156/226, 227; 93/1.5; 223/46; 2/244; 132/47; 428/4, 5

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[57] **ABSTRACT**

A circular pompon bow is formed from a continuous ribbon which contains spaced L-shaped slits which define easily twisted regions at the regions of the ribbon which overlap and are stapled together. The bow is formed by feeding a continuous ribbon from a supply reel, forming the slits in the ribbon, and sequentially impaling the ribbon adjacent the slit portions on a rotating impaling spindle. When the bow loops are completed, a backing card having a pressure-sensitive surface for mounting the bow is applied against the bow, and a staple is driven through the card and the overlapping ribbon layers to secure the card and bow loops together. The completed bow is then removed from the spindle. Two or more center loops can be formed to fill in the center of the bow and to serve as anchoring loops for anchoring plastic ornaments.

1 Claim, 13 Drawing Figures

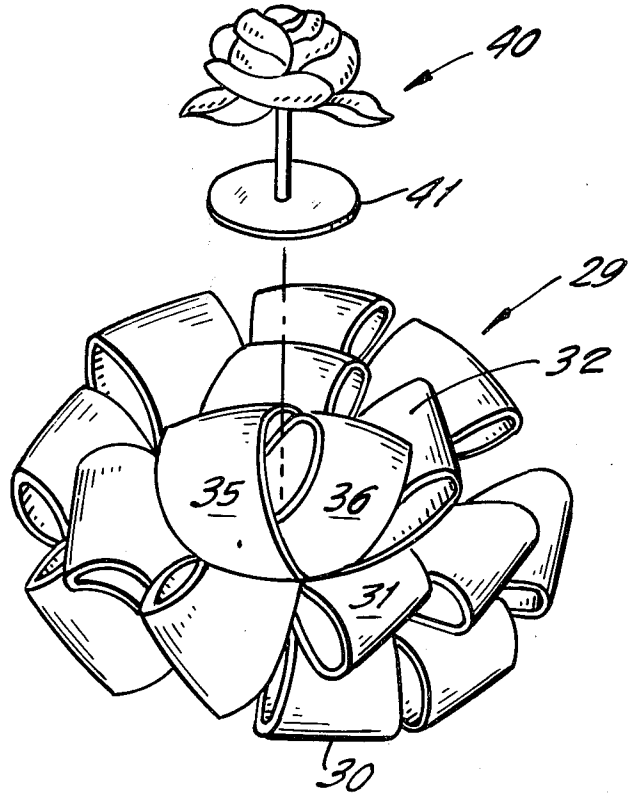


FIG. 1

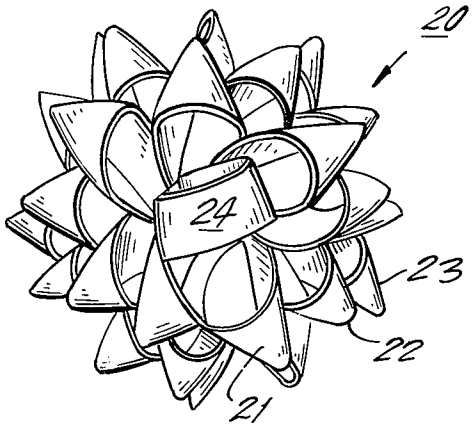


FIG. 2

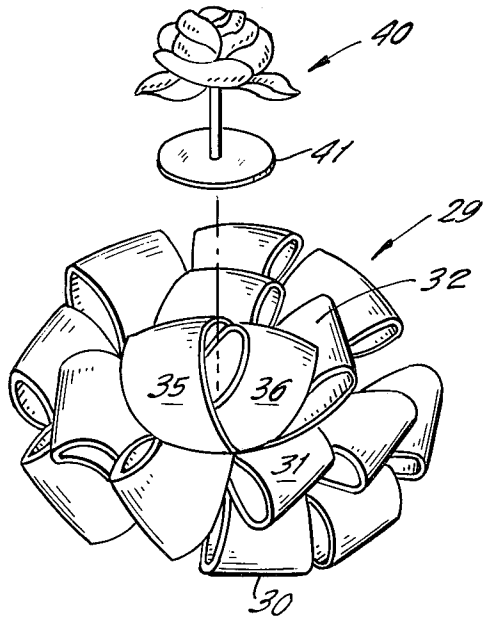


FIG. 5

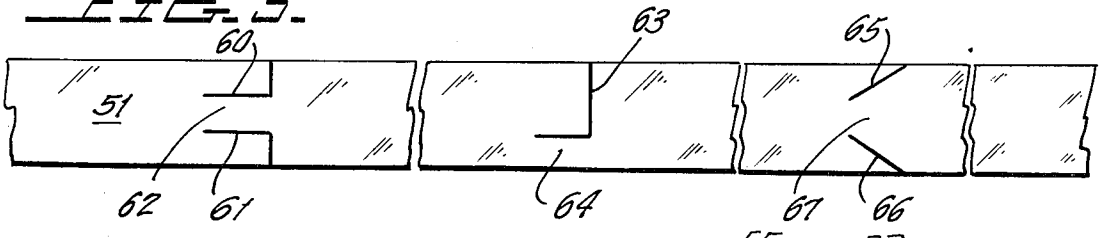
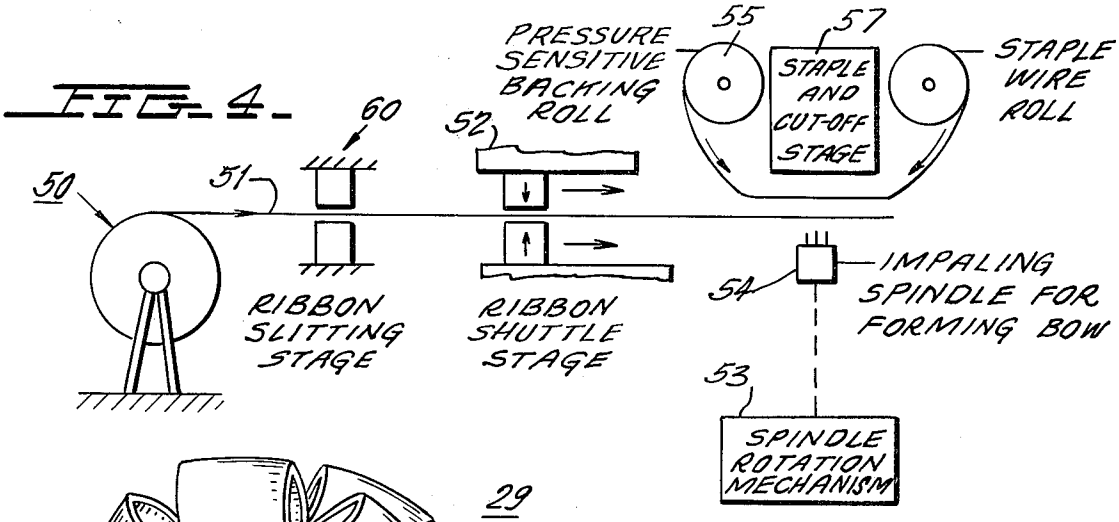


FIG. 4



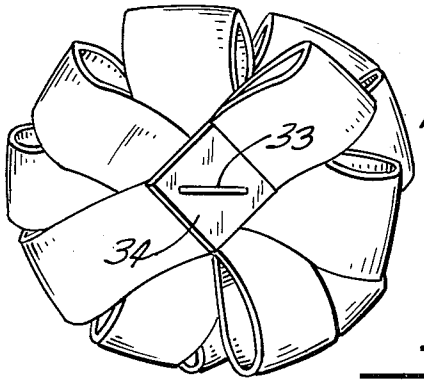


FIG. 3

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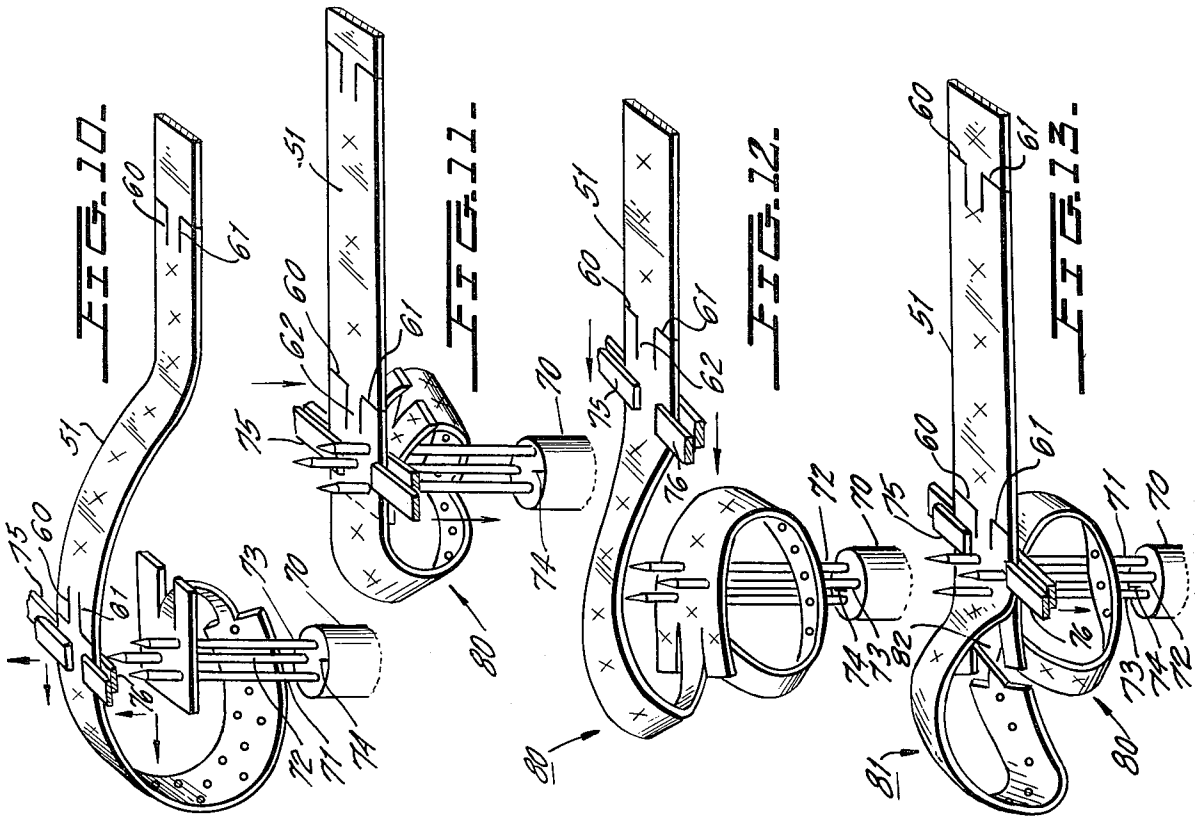

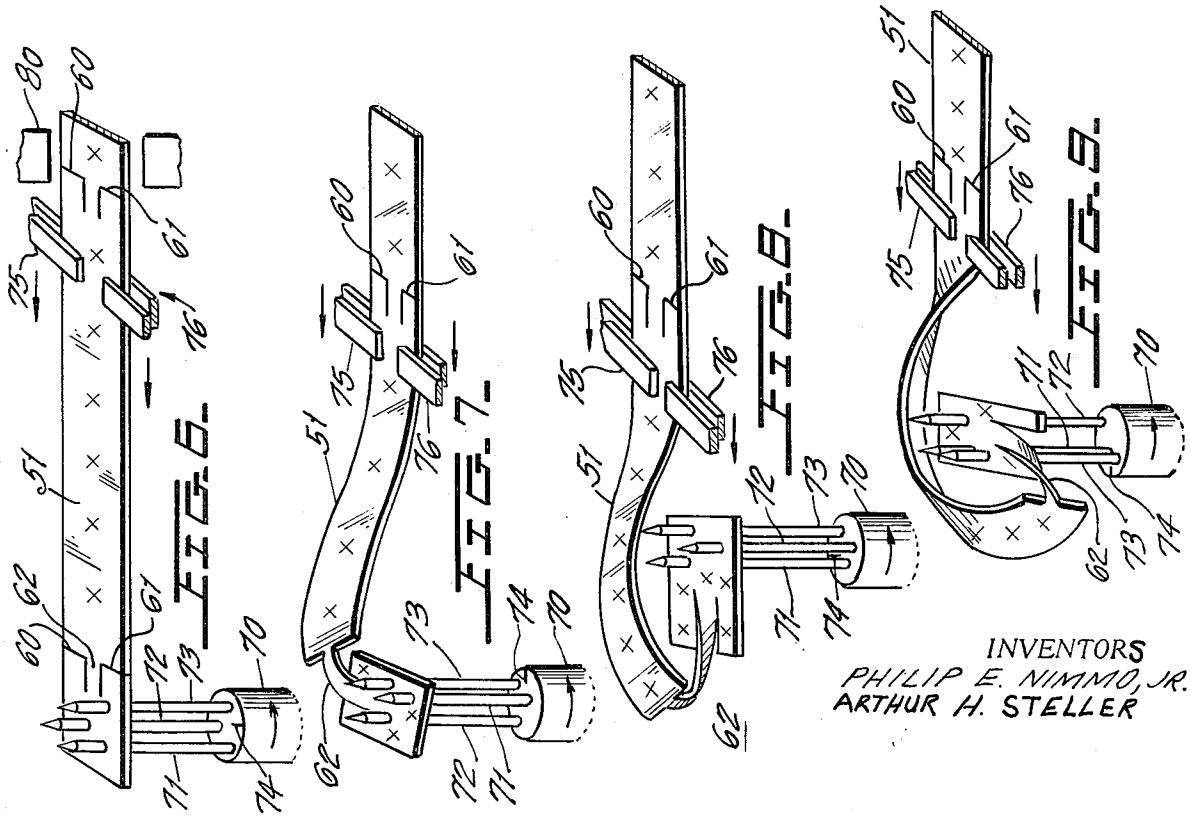

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CIRCULAR GENERATING POMPON BOW STRUCTURE

RELATED APPLICATIONS

The bow of the present invention can be manufactured by apparatus of the type shown in copending application Ser. No. 19,904, filed Apr. 4, 1960, in the name of Eugene Jacobson, and assigned to the assignee of the present invention (now U.S. Pat. No. 3,545,656), where the apparatus is modified by the adjustment of the angle of rotation of the spindle and by the provision of a slitting means to transversely slit ribbon before it is impaled on a rotating impaling means.

BACKGROUND OF THE INVENTION

This invention relates to improved bow structures used for decorating gift packages and the like, and also relates to a novel process for the production of such bow structures.

Machine-made decorative bows are now available in many different styles. One popular style bow is known as a star bow and consists of radially displaced conical loops formed from a continuous length of ribbon. The ribbon loops are secured in place by a securing pin or staple. A pressure-sensitive backing card for mounting the bow is also connected to the bow by the staple. Bows of this type, and apparatus for their production, are shown in the following U.S. Patents: U.S. Pat. No. 2,933,223 to Kravig et al; U.S. Pat. No. 3,112,240 to Kravig et al; U.S. Pat. No. 3,338,483 to Thayer; U.S. Pat. No. 3,396,880 to Lopata; U.S. Pat. No. 3,415,429 to Lopata; U.S. Pat. No. 3,464,601 to Christensen.

The star bow has enjoyed wide commercial acceptance because of its low cost, due in great part to the possibility of using high-speed automatic machinery for generating the star bow geometric shape. However, because of the star bow's regular and fixed geometry, it has a machine-made, rather than a handmade appearance. This is especially evident where the ribbon is fairly stiff or self-supporting, as is the case of commonly used extruded polypropylene ribbon, and in contrast to a thin woven fabric.

A bow having a more aesthetically pleasing shape is known as a pompon bow. The pompon bow has a random disposition of its loops rather than the strictly defined appearance of the conical loops of the star bow. Therefore, the pompon bow has a softer and handmade look, rather than the machine-made appearance of the star bow. The pompon bow, however, cannot be made on conventional star bow making type apparatus, especially where the ribbon is a stiff material. That is, the loops of the ribbon self-supporting and do not fall properly to give the desired random appearance of the handmade pompon bow loops.

In order to make the loops of a bow fall in a random manner, it is known to notch the ribbon at the region where the loops are connected, thereby to weaken the loops at their support to permit them to drape arbitrarily. This arrangement is shown in my U.S. Pat. No. 3,318,497, where the ribbon is notched by spaced opposing notches. These notches are then stapled close to one another on a backing card, forming loops between adjacent notches. Since the loops are weakened at their base by the notches, the loops tend to fall in a random manner.

U.S. Pat. No. 3,236,426 to Kerrigan et al also shows the use of notches in a ribbon and the fastening together of the bow loops at the notched region. Again, a pompon-shaped bow is fashioned since the loops of the bow fall arbitrarily on their weakened base sections.

A major disadvantage of the use of notched ribbon is that costly and unreliable dies are needed to form the notches. For example, if a bow having twenty loops is to be formed in seven seconds (to be competitive with the star bow), an in-line notching die which notches the ribbon from a supply reel must operate three times per second. This requires an expensive and complex notching mechanism which is subject to jamming, incomplete notching, and the like, especially when it is used for ribbon materials of varying stiffness, thickness, and width.

A further serious problem with notched ribbon is that it generates a large amount of unusable scrap. That is, the notched sections require periodic removal and disposal. Moreover, these scraps are a serious source of litter in the factory.

A further problem with notched ribbon is that the notches may be visible in the completed bow, thereby detracting from the bow appearance.

SUMMARY OF THE INVENTION

In accordance with the present invention, a pompon bow is made of a ribbon which contains slits at the regions which are to lie adajcent one another in the completed bow. These regions serve as the base or supports for the loops defined between adjacent regions which are secured together in the finished bow. By "slitting" is meant herein the cutting of a ribbon without the removal of material from the width of the ribbon, which would occur when notches are removed from the ribbon or holes are punched or cut into the ribbon. Such "slits" are further defined as extending, at least partly, perpendicular to or at an angle to the longitudinal direction of the ribbon, thereby to define a "bridge" of ribbon material having a width which is less than the width of the ribbon. The slits in the ribbon then permit the bow loops to fall gracefully to form a pompon bow, even when the bow is generated on a star bow making apparatus.

An important feature of the invention is that the slit ribbon can be processed at great speed on a standard type of star bow machine. Moreover, the bow is circular rather than oval, as in the case of my previously mentioned U.S. Pat. No. 3,318,497. It will also be apparent that a scrap problem is avoided since sections are not physically removed from the ribbon.

As a further advantage of forming slits rather than notches or holes in the ribbon, the slit leaves more ribbon in the bow and, when the ribbon is twisted, the slit sections tend to nest relative to one another, thereby to disguise the slit. Unlike a notched ribbon, where the notching is evident, the slit sections are virtually invisible.

As a still further feature of the invention, and applicable to star bows or pompon bows alike, the bow may be formed with at least two center loops. This permits better filling of the center of the bow. Moreover, these two center loops will be adjacent one another and can serve to trap an ornament which has an elongated securing flange.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a prior art type star bow.

FIG. 2 is a plan view of the bow of the present invention and further shows, in exploded perspective, an or-

nament which can be anchored between the two center loops of the novel bow.

FIG. 3 shows the bottom of the bow of FIG. 2.

FIG. 4 schematically illustrates the process used to produce the bow of the present invention.

FIG. 5 illustrates a few of the slit shapes which can be used to practice the invention.

FIGS. 6 to 13 schematically illustrated, in perspective view, progressive steps in the partial formation of the bow of FIGS. 2 and 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIG. 1, there is shown a conventional star bow 20 consisting of a plurality of conical loops, such as loops 21, 22 and 23, which are disposed in different discrete layers of loops, with the loops in each layer being regularly spaced from one another. The center of the bow is filled by a circular loop 24, and all the loops are secured together as by a staple or pin which is obscured in FIG. 1 by the loop 24. As discussed previously, the loops of bow 20 are generally rigid and self-supporting and the bow has a contrived or machine-made appearance. The bow is inexpensive, however, since its shape lends itself to manufacture by high-speed and relatively simple apparatus. Another advantage of the bow of FIG. 1 is that it always presents the same ribbon surface to view. Thus the ribbon used need have only one finished or decorative side.

FIGS. 2 and 3 show the pompon bow 29 of the present invention. It should be noted that while the bow shape is machine-generated, as will be later described, the bow appears to consist of arbitrarily arranged loops, such as loops 30, 31 and 32, and the loops do not have a regular spacing relative to one another. As shown in FIG. 3, the bow is held together by a staple 33 which passes through a standard backing card 34 which has the usual pressure-sensitive surface covered by a peelable strip.

The center of the bow, as shown n FIG. 2, is filled with circular loops 35 and 36. One or more such loops can be used to fill out the bow center. These circular loops (loops 35 and 36 in FIG. 2 and loop 24 in FIG. 1) are distinct from the other bow loops in that they are formed by rotating one end of the loop through 360° with respect to the other end of the loop, and then laying the two ends atop one another. The other loops of the bow are commonly formed by rotating their adjacent or superimposed end portions less than 360°. The use of a plurality of such 360° loops in combination with conventional loops formed by rotation of less than 360° is novel in connection with pompon type bows and permits the formation of a bow having a "full" appearance while using fewer loops and thus less material.

As a further feature of the invention, the use of at least two 360° loops in the center of the bow permits the use of the loops for anchoring ornaments. Thus, it is common to attach small ornaments to a bow by means of a flexible wire tied between the bow and ornament. When the bow is formed with at least two center loops, however (center loops 35 and 36 in FIG. 2), an ornament 40, shown as a molded plastic flower, may be fixed to the bow by providing the ornament with an integral enlarged base or flange 41 which is inserted between and trapped within loops 35 and 36. The additional cost of the base 41 for the ornament is far outweighed by the cost of the prior art flexible wire and hand labor needed to wire the ornament to the bow.

FIG. 4 schematically illustrates a bow-manufacturing system which is modified in accordance with the slitting operation of the present invention. In FIG. 4, there is schematically illustrated a supply reel 50 of a suitable ribbon which could, for example, be a conventional polypropylene ribbon having any desired width which typically could be from about one-half inch to 1 inch. Other ribbon widths could also be used, but most commercial ribbon used for bow manufacturing would fall within this range.

In a conventional bow-manufacturing apparatus, such as the apparatus shown in copending application Ser. No. 19,904, in the name of Jacobson, now issued as U.S. Pat. No. 3,545,656, the ribbon 51 issuing from reel 50 is moved by any desired type of ribbon shuttle, schematically shown as ribbon shuttle stage 52 which sequentially advances ribbon lengths from reel 50 in coordination with a spindle rotation mechanism 53, which rotates the ribbon impaling spindle 54. The operation of spindle 54 and its coordination with ribbon shuttle means 52 is described in detail in the above-noted copending application Ser. No. 19,904 and this same mechanism may be used in connection with the present invention. In addition to this mechanism, there is provided a reel 55 of card stock having a pressure-sensitive surface covered by a peelable strip. This tape is cut into short cards, such as card 34 of FIG. 3, which are stapled to each bow when the bow is completed. There is further provided a roll of wire 56 which is formed into staples in order to staple together a completed bow after it is completed on the spindle 54.

A suitable mechanism 57 which, again, may be of the type shown in the above-noted copending application Ser. No. 19,904, is provided for forming the staple, for applying a card section to the ribbon, and for cutting off the ribbon so that the completed bow can be discharged from the impaling spindle 54 in the usual manner.

All of the above mechanism, described in connection with FIG. 4, is conventional.

In accordance with the present invention, a ribbon slitting stage 60 is further provided to form transverse slits in the ribbon at regions adjacent those spaced areas of the ribbon which are to be received on the impaling spindle 54.

FIG. 5 illustrates various slit shapes which can be used. Thus, the slit can have the appearance of the two L-shaped sections 60 and 61 which are cut completely through the ribbon 51, leaving a relatively narrow bridge 62 of ribbon material which flexes more freely than the unslit ribbon could flex. As described previously, a "slit" in accordance with this disclosure is defined as a physical cut through the ribbon, which cut extends at least partly transversely or at an angle to the longitudinal direction of the ribbon. The essential purpose of this slice is to produce the short width ribbon section 62, which flexes more easily than the full width. Note that a notch is not produced since material is not physically removed from the ribbon.

Other suitable slit shapes are shown in the ribbon 51 in FIG. 5 including the single L-shaped slit 63 which defines the ribbon "bridge" 64, or the angularly directed straight slits 65 and 66 which define the bridge 67. Other slit shapes, which could be used, will be apparent.

The bow-making operation and the part played by the various slits in the ribbon are best understood from a consideration of FIGS. 6 to 13. Referring to FIG. 6,

there is illustrated a conventional spindle **70** having three impaling needles **71, 72** and **73** extending therefrom. An index mark **74** has been applied to spindle **70** to indicate its angular position at various times in the manufacturing process. The spindle **70** is conventional and is rotatable in the direction shown by the arrows. Moreover, impaling needles **71, 72** and **73** are retractable to permit a stapling operation against the spindle end after the bow is completed. This too is conventional and is described in detail in copending application Ser. No. 19,904.

FIG. **6** further schematically illustrates the shuttle mechanism for moving the ribbon as consisting of two pairs of gripping fingers **75** and **76.** These conveniently represent the more complex shuttle mechanisms which are used and are shown in detail in application Ser. No. 19,904 now U.S. Pat. No. 3,545,656. The shuttle is conventionally operated by gripping the ribbon in the position of FIG. **6** and, during the operating sequence, moving the ribbon toward the spindle **70** and then upwardly, and then down onto the needles **71** to **73.** Alternatively, the shuttle (members **75** and **76**) may be simply reciprocated in a straight line, with the spindle needles **71, 72** and **73** moving upwardly to pierce the ribbon when the shuttle reaches its left-hand most position. This is another conventional shuttle movement known in the art.

When the shuttle fingers **75** and **76** move back toward the position of FIG. **6,** the fingers open, releasing the ribbon until they reach the FIG. **6** position. The fingers then close and grasp a section of ribbon which is subsequently brought forward. This is then repeated in a continually repeating cycle.

The ribbon **51,** shown in FIG. **6,** is further shown with Xs on one surface and small circles on the other surface so that it is easier to follow the various loop convolutions created during the manufacturing process. The surface with the Xs is the finished or decorated surface of the ribbon which is to appear externally while the surface with the circle marking will be hidden. Thus ribbon finished only on one surface can be used.

FIGS. **6** to **13** also show the use of opposing L-shaped slits **60** and **61.** FIG. **6** schematically illustrates the disposition of the ribbon slitting stage **60** such that the ribbon is slit at a region in front of the gripping members **75** and **76.**

Prior to reaching the condition of FIG. **6,** a previous bow was made and discharged from the apparatus, or the machine was not operating. The first step in the manufacture of the bow is to advance the shuttle members **75** and **76** and impale ribbn **51** on spindle **70,** as shown in FIG. **6.** Thus, FIG. **6** shows the ribbon with one end of the ribbon impaled on needles **71, 72** and **73** at a region immediately adjacent slits **60** and **61.**

The first loop to be formed in the manufacture of the bow is the center loop which is a 360° loop. The beginning of this loop is shown in FIG. **7** where it is seen that the spindle **70** and needles **71, 72** and **73** have rotated about 90° from the position of FIG. **6,** and that the shuttle members **75** and **76** are advancing the ribbon **51** toward the spindle **70.** Note that the ribbon **51** begins to bend mainly on the thin bridge ribbon **62.**

The shuttle members **75** and **76** continue to advance in the direction of the arrows shown in FIG. **7** to the position of FIG. **8,** where the spindle has now rotated another 90° from the position of FIG. **7.** Note that the ribbon **51** begins to bulge outwardly and that the material bridge portion **62** continues to twist. Spindle **70** continues to rotate and the shuttle continues to advance toward the spindle to the position of FIG. **9,** which is rotated about 270° from the position of FIG. **6.** The ribbon between bridge **62** and the gripping members **75** and **76** begins to bow downwardly and over the top of the needles **71, 72** and **73.**

Finally, the spindle **70** reaches a 360° rotation and the ribbon **51** has curled down and against the side of needles **71, 72** and **73** and the next set of slits **60** and **61** are above and just beyond the impaling needles. Note that in moving from the position of FIG. **9** to the position of FIG. **10,** that the shuttle members **75** and **76** moved toward spindle **70** and upwardly to poise the ribbon atop the impaling needles.

Thereafter, and as shown in FIG. **11,** while the spindle **70** is stationary, the shuttle members **75** and **76** move downwardly to impale ribbon **51** adjacent the ribbon bridge section **62** onto the needles **71, 72** and **73.** Note further that the X marked surface is the exterior surface over the full convolution of the ribbon and that most of the ribbon rotation takes place in the first section **62** of the ribbon shown originally in FIG. **6.**

Where additional center loops are desired, such as the two center loops in FIG. **2,** the sequence of FIGS. **6** to **11** is repeated.

Once the desired number of center loops is obtained, the normal bow loop can be made. This is shown in the sequence of FIGS. **12** and **13** where, after the production of the first center loop **80,** a conventional bow loop is formed. The conventional loop is formed by reducing the angle of rotation of spindle **70** for one cycle of operation of the shuttle. Thus, the shuttle members **75** and **76** pick up a new length of ribbon and advance the new length of ribbon toward and upwardly over the needles **71, 72** and **73** while the spindle **70** rotates, for example, by about 150°. The conventional pompon loop is shown in FIG. **13** as loop **81** which is primarily twisted by 150° on its reduced width section **62.**

In order to form the next loop, the shuttle members **75** and **76** release the ribbon **51,** move backwardly to grasp a new length of ribbon, and then move forward to impale a new loop while the spindle **70** rotates for another 150°. This is continued until the bow is completed, with the various loops being formed being pleasingly disposed in an arbitrarily appearing fashion because of the ribbon loop flexibility of their slit sections.

Once the bow is completed on the spindle **70,** conventional apparatus can automatically apply a backing card to the back of the bow and then apply a staple through the backing card and the loop bases to secure the bow together. Thereafter, a suitable knife or scissors mechanism severs the ribbon and card and the formed bow is ejected from spindle **70.** The machine then begins the manufacture of a new bow.

A principal advantage of the present invention is that present star bow making equipment can be easily and quickly modified to produce the type bow contemplated by the present invention. Only a few changes are needed, one being the addition of the simple slitting mechanism. Another change which should be made is in the indexing mechanism which rotates the spindle in coordination with the shuttle. Thus, in the conventional star bow equipment, the spindle rotates 360° to form the center loop and then will rotate about 225° to form the conical loops. The indexing mechanism is altered to produce bows of the present invention so that the rotation required for forming a loop will be about 150°.

Clearly, different ranges of angles could also be used.

In describing the operation in connection with FIGS. **6** to **13,** it should also be noticed that the spindle rotation and shuttle advancement can occur simultaneously. If desired, however, the shuttle advance can precede the spindle rotation for the formation of each loop.

The above shows one manner in which a bow can be made by presently available automatic bow making machinery which is slightly modified with slitting capability. It will be apparent that any other desired equipment could be used or designed to make the bows automatically or semi-automatically. Moreover, it will be apparent that the novel bow could be handmade.

Although this invention has been described with respect to its preferred embodiments, it should be understood that many variations and modifications will now be obvious to those skilled in the art, and it is preferred, therefore, that the scope of the invention be limited not by the specific disclosure herein, but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A decorative bow formed of a single continuous ribbon comprising, in combination:

a. a plurality of bow loops radiating outwardly from a common central region;

b. a plurality of circular loops extending upwardly from said common central region and filling in the center of said bow to form a circular cluster of loops with said bow loops;

c. a generally flat bottom surface and a bow mounting member disposed at the center of said flat bottom surface;

d. a securing means for securing together said bow loops, said circular loops and said mounting member; and

e. an ornament having a thin post extending therefrom and a flange extending from the end of said thin post, said flange being disposed under and within two adjacent circular loops to connect said ornament to said bow.

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