

[54] **PREFABRICATED BOW FORMS**

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[21] Appl. No.: **320**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 791,992, Jan. 17, 1967, abandoned.

[52] U.S. Cl. **161/49, 161/9, 161/112, 161/140, 223/46**

[51] Int. Cl. **D04d 7/10**

[58] Field of Search **2/244, 300; 289/1.2; 93/1.5; 112/410, 411; 132/47; 161/9, 10, 21, 49, 112, 140; 28/2; 223/46; 156/226, 227**

[56] **References Cited**

UNITED STATES PATENTS

2,763,080 9/1956 Welch 161/10

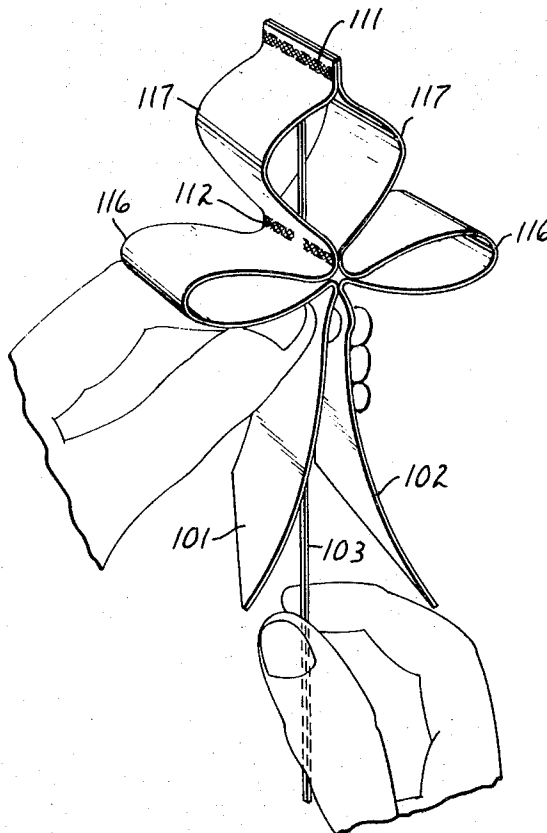
2,849,821 9/1958 Doig 161/10
 3,030,719 4/1962 Enomoto 161/30
 3,256,129 6/1966 Wallerstein 161/10

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[57] **ABSTRACT**

Apparatus for mechanically fabricating prefabricated bow forms from two strips of decorative ribbon material and including a drawstring partially bonded to the ribbon, said apparatus comprising a ribbon and drawstring supply, motor means, a ribbon bonding assembly for bonding said ribbon materials together at spaced points, a ribbon advancing means and a ribbon cutoff means. A simple method of forming decorative bows from the prefabricated bow forms is also disclosed, said method comprising accumulating the bonded areas of said prefabricated bow forms one upon another, simultaneously forming loops of ribbon on either side of said bonded areas, by means of the drawstring.

2 Claims, 14 Drawing Figures



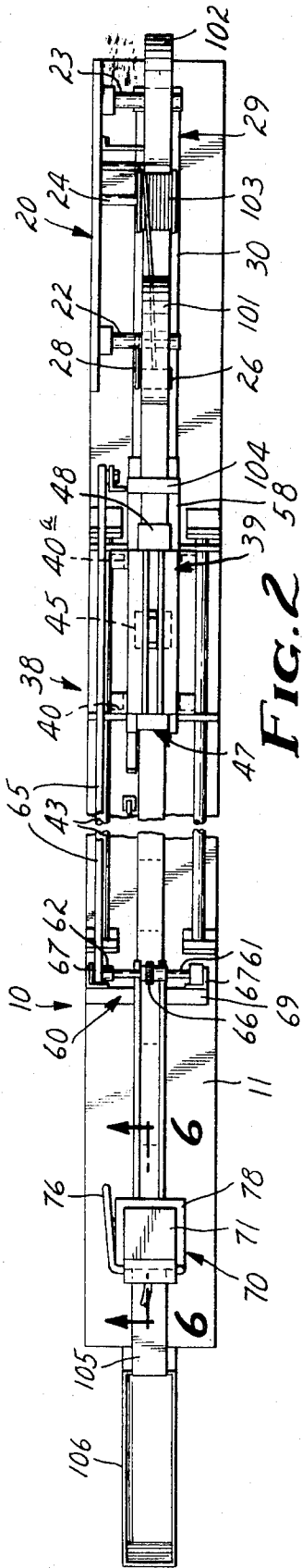


FIG. 2

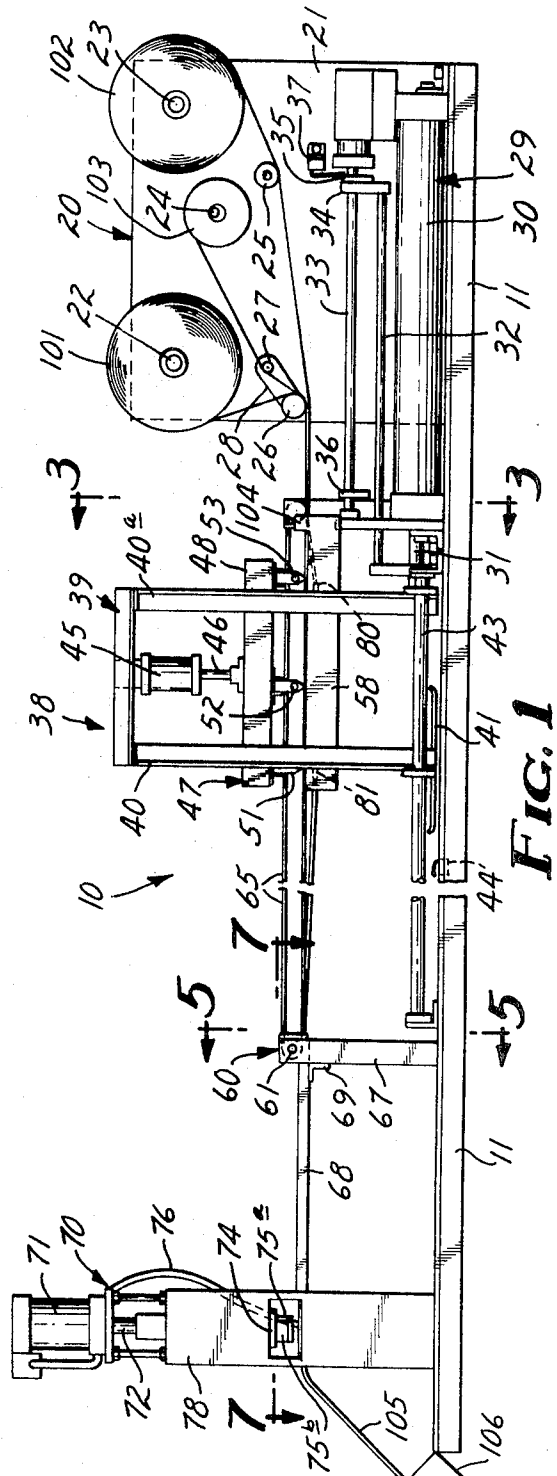


FIG. 1

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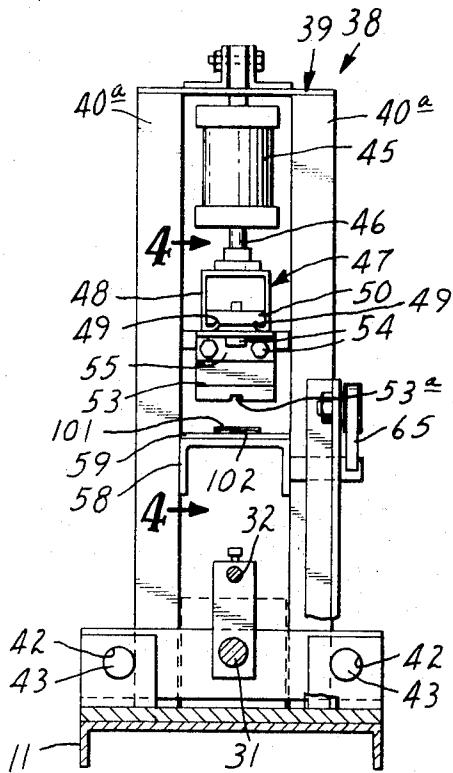


FIG. 3

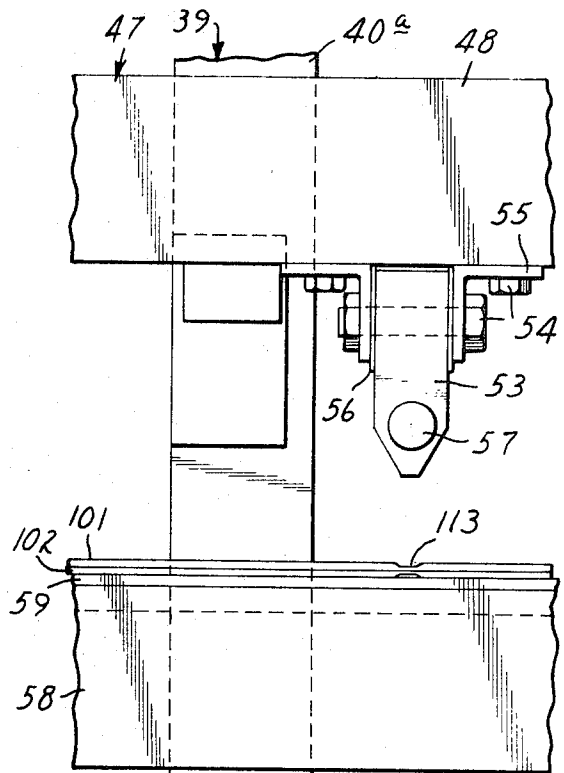


FIG. 4

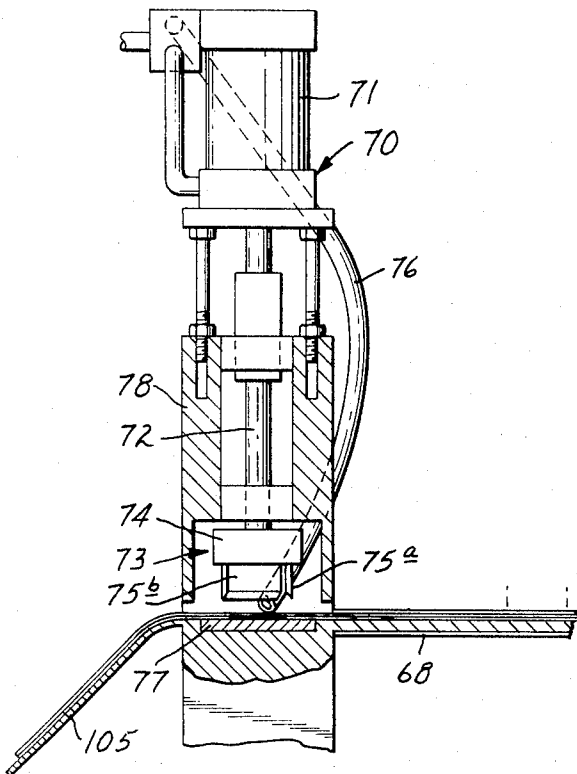


FIG. 6

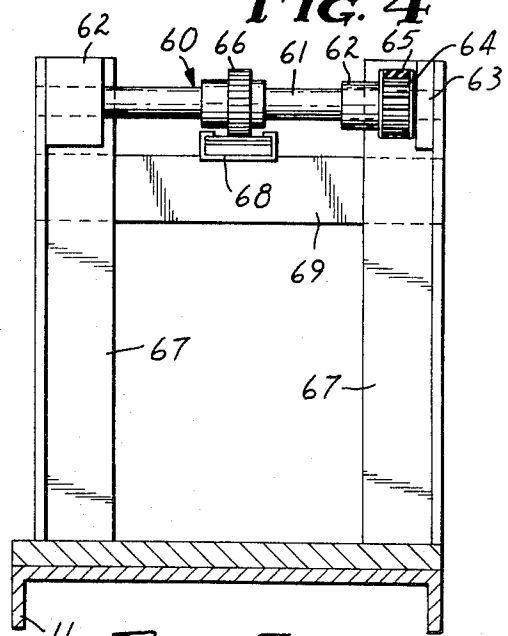


FIG. 5

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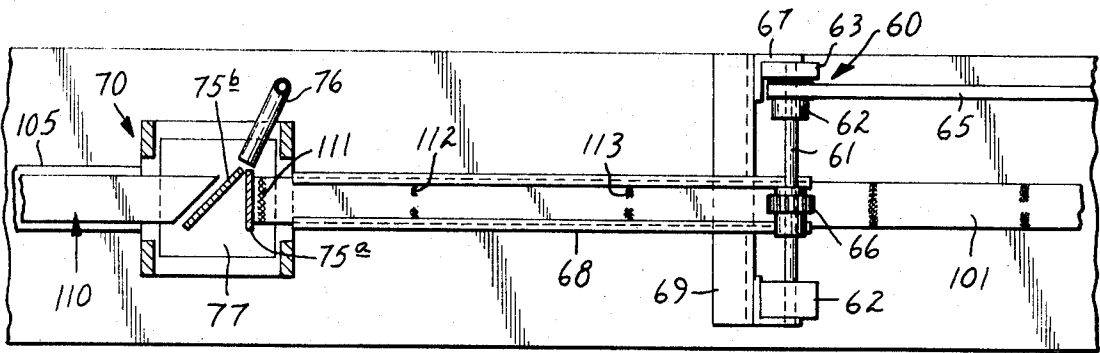


FIG. 7

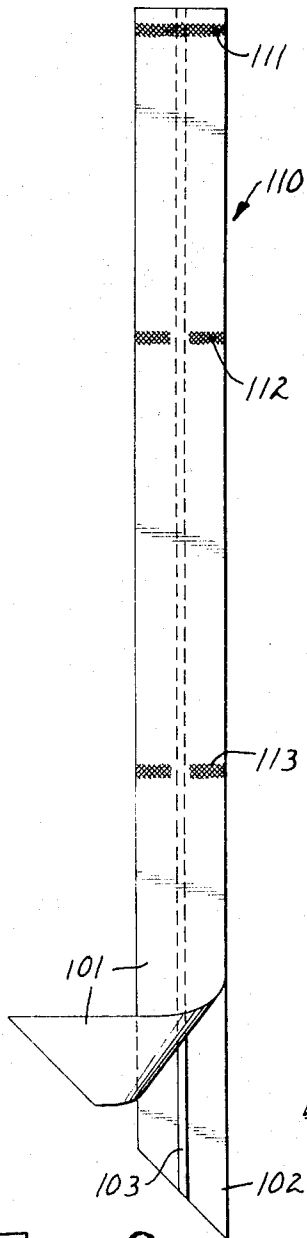


FIG. 8

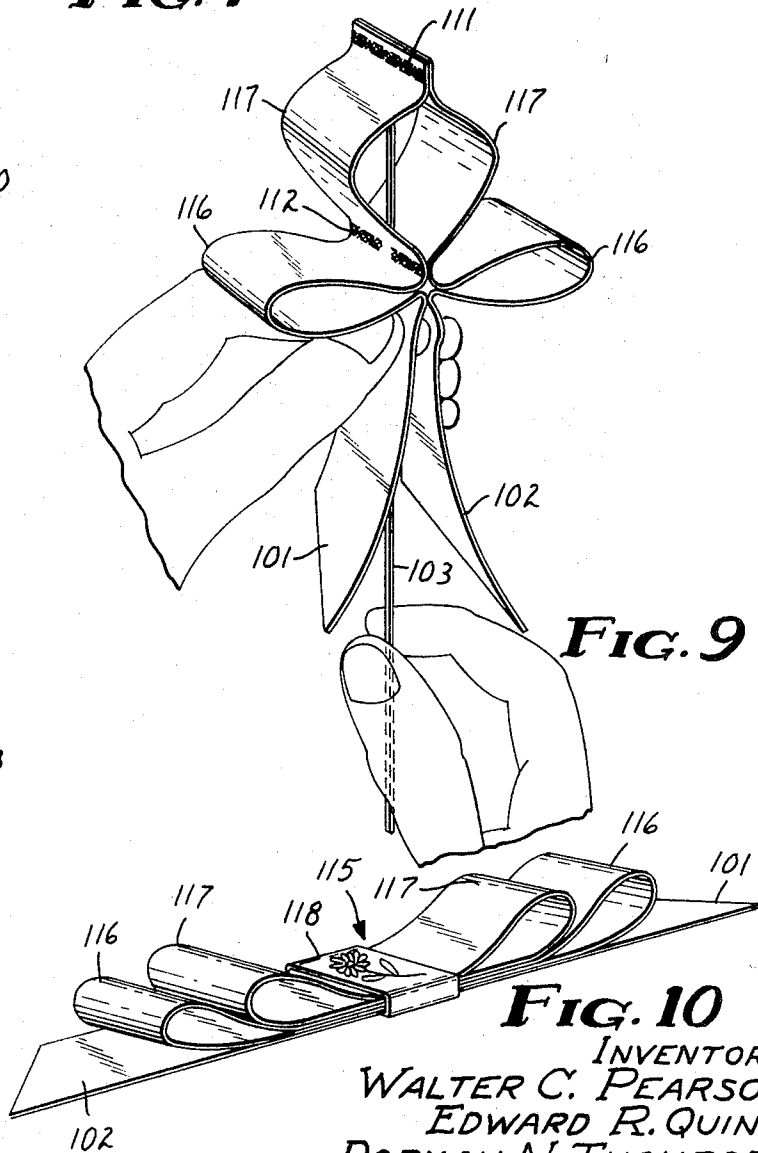


FIG. 9

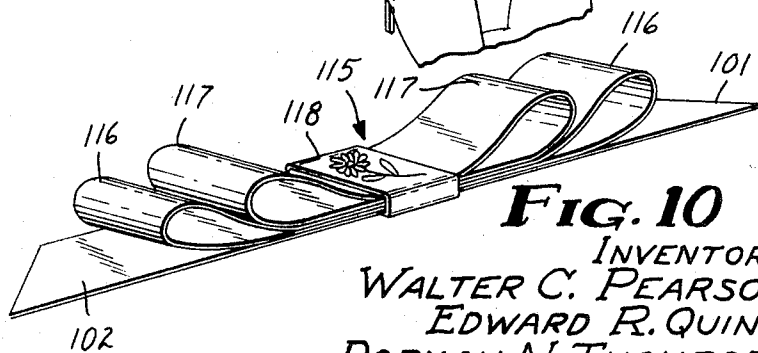


FIG. 10

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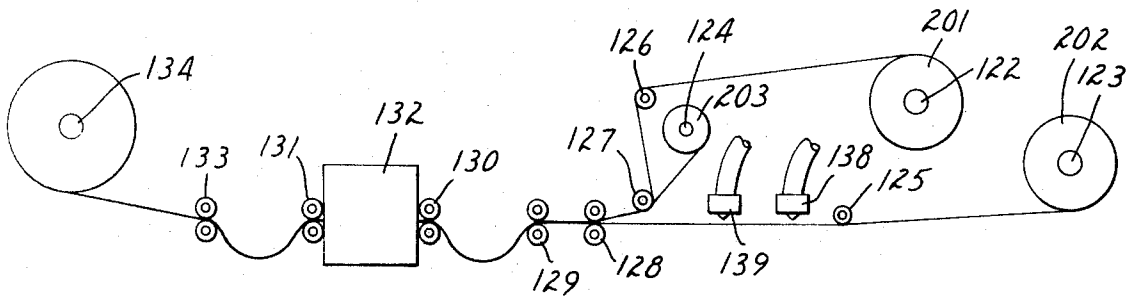


FIG. 11

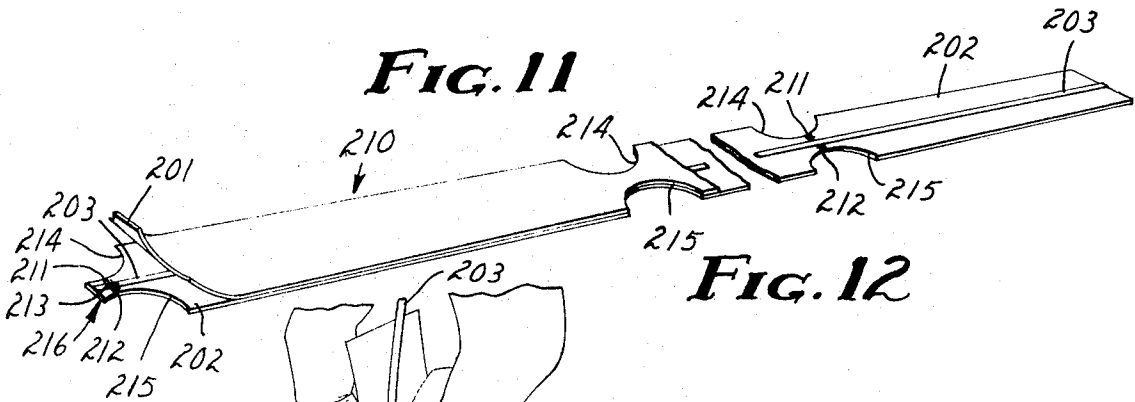


FIG. 12

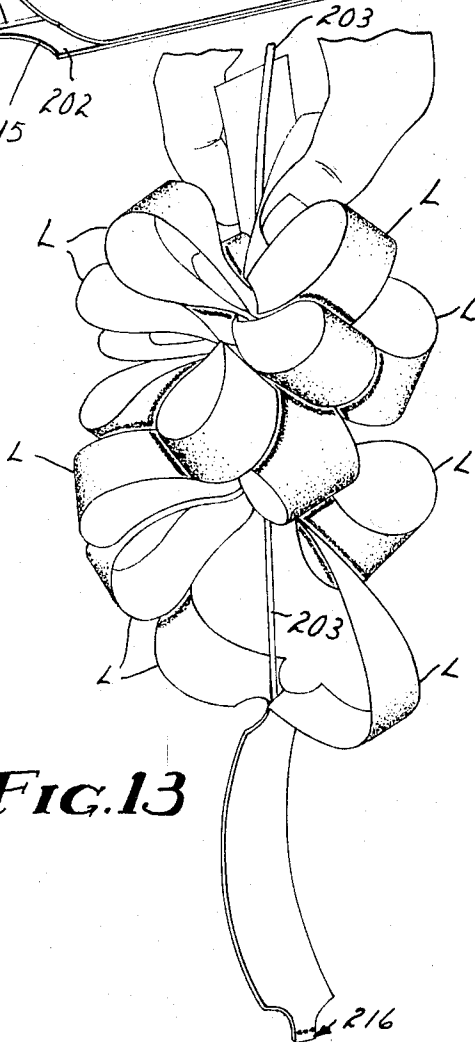


FIG. 13

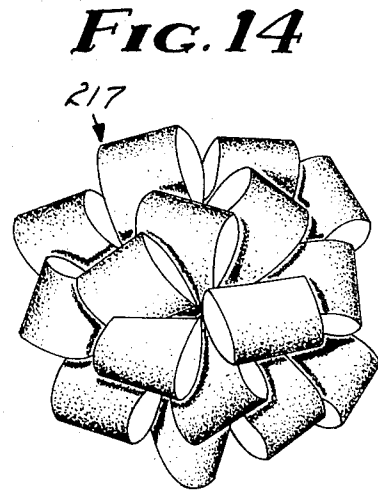


FIG. 14

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PREFABRICATED BOW FORMS

This application is a continuation-in-part of application Ser. No. 791,992, filed Jan. 17, 1969, and now abandoned.

The present invention relates to the art of gift wrapping packages and provides a method and apparatus for mechanically producing ornamental bows.

In recent years the gift wrapping of packages both at the point of purchase and by the product manufacturer has become a highly commercialized business. Manufacturers of decorative ribbons and decorative wrapping papers and such like have vigorously promoted the use of their commodities in the preparation of attractively wrapped packages. Many industrial concerns, for example, department stores and novelty shops, have organized separate departments almost exclusively engaged in gift wrapping commodities purchased elsewhere in their stores. Particularly around holiday times, these departments gift wrap large numbers of packages every working day. Others have made a business of fabricating decorative bow structures in mass quantities for sale to home users, so that the latter can wrap their own gifts and packages, and formulate their own decorative displays without having to tie or fabricate decorative bows themselves.

Such wide and increasing commercial usage of decorative ribbon products require that the decorative bow structures be susceptible to production in large quantities in a relatively short time. The fewer manual operations involved the better. However, in order to be sufficiently aesthetically pleasing and unique so that the purchasing public is willing to use the bow products on personal gifts and packages, the bows must be individualistic in appearance, that is, they should not be stereotyped or nonpersonal. Ordinarily, mass production, on the one hand, and the provision of attractive, unique, individualistic and artistic appearing bow products, on the other, are antagonistic desires. The present invention is especially concerned with the mutual satisfaction of these wants.

Various literature articles and patents have issued from time to time over recent years relating to the provision of decorative bow structures and to machines and devices for making the same. The ornamental pompon or puff bows and "star" bows have become quite popular. This popularity is due, in large part, to the ease and speed with which pompon bows can be formed from a prefabricated hank of ribbon or by machines in the case of the "star" bows. Most recently, machines for making pompon or puff bows have come into use. It must be recognized, however, that completely formed machine fabricated bows require an inordinate amount of storage space and care must be exercised in handling such completed bows lest they are crushed or otherwise damaged.

In contrast, formal or tailored bows are typically fashioned by hand from a plurality of loops of ribbon of different lengths lineally superimposed one upon another with the smallest loop on top, the center of the loop stack being then held together with a constraining device which may be a band of ribbon material or a decorative band. Although the formal or tailored bow is well accepted and desired by a large majority of people, it has not been commercially available in great quantities due to the large amount of manual operations required in the fabricating process and the fragile nature of the ribbon loops.

The present invention provides simple apparatus for mechanically fabricating partially completed formal bows (prefabricated bow forms or prebows) and provides a method for producing formal bows.

The present invention also provides apparatus for mechanically fabricating prebows of the pompon or puff bows and provides a unique method for producing pompon or puff bows.

The present invention possesses a number of advantages, among which are the following:

1. A large number of prebows, along with a selection of constraining devices for formal bows can be made conveniently available to the user in a relatively small container or containers.

2. Shipping and handling of the bonded flat prebows reduces to a minimum the possibility of mutilation or degradation of the aesthetic value of the completed bows.

3. The method for forming the completed bows is so simple that the user need not have special skills or above average manual dexterity to form the bow in minimal time.

4. The ribbon material used for the bow may be either one sided or two sided, i.e., ribbons finished on one face or on both faces.

5. Since the ribbon material input is in pairs, either ribbon can be changed so as to produce a bow construction having dissimilar colors, textures, patterns or materials from one side to the other.

6. The number of bonded areas and the distance between them may be varied to produce bows with a correspondingly varied number and size of loops.

7. The distance between the final bonded area and the end of the bow tail of formal prebows can be lengthened sufficiently to provide the bow with its own facility for banding to the package to which it is to be attached.

The invention will be more readily understood from the following detailed description and disclosure, especially in light of the accompanying drawings, wherein like numerals refer to corresponding parts in the several diagrammatic views, in which:

FIG. 1 is a front elevational view of a machine of the present invention;

FIG. 2 is a plan view of the machine of FIG. 1;

FIG. 3 is an end elevational view of the ribbon bonding mechanism taken along line 3—3 and in the direction shown in FIG. 1;

FIG. 4 is an enlarged side view of the heat-sealing device taken along line 4—4 of FIG. 3;

FIG. 5 is an end elevational view of the ribbon advancing means taken along line 5—5 of FIG. 1;

FIG. 6 is a sectional view of the ribbon cutoff means taken along the line 6—6 of FIG. 2;

FIG. 7 is a sectional view of the ribbon advancing means and the ribbon cutoff means taken along the line 7—7 of FIG. 1;

FIG. 8 is a plan view of a prebow according to the present invention;

FIG. 9 is a perspective view of the prebow of FIG. 8 in the process of being converted to the formal bow of the present invention;

FIG. 10 is a perspective view of the formal or tailored bow of the present invention;

FIG. 11 is a diagrammatic view of another embodiment of a machine of the present invention particularly suited for the fabrication of pompon bows;

FIG. 12 is a perspective view of the prebow for pompon bows fabricated by the machine of FIG. 11 with portions of the ribbon material removed;

FIG. 13 is a perspective view of the prebow of FIG. 12 in the process of being converted into a pompon bow; and

FIG. 14 is a perspective view of the completed pompon bow.

Referring now to the drawings, the machine 10 comprises a base 11 upon which is mounted ribbon supply means 20, motor means 29, ribbon bonding assembly 38, ribbon advancing means 60 and ribbon cutoff means 70.

Ribbon supply means 20, in the embodiment shown in the drawings, comprises a plate member 21 suitably affixed to base 11. Ribbon spindles 22 and 23 and drawstring spindle 24 are mounted onto plate member 21 to removably rotatably accommodate the necessary ribbon and drawstring supply rolls. Also mounted onto plate member 21 are ribbon guide members 25 and 26 as well as drawstring guide member 27, all in the form of spindles. In the embodiment shown in FIGS. 1 and 2, ribbon guide member 26 is supported by arm 28 affixed to drawstring guide member 27. Ribbon guide member 26 is additionally provided with a grooved plate (not shown) which centers the drawstring as the composite of ribbons and drawstring are drawn into the machine.

Motor means 29, as shown, is a reciprocating air motor having an air cylinder 30, a reciprocating drive shaft 31 to which

is attached a follower shaft 32 and guide rail 33. Follower shaft 32 is provided with a collar 34 which is rigidly secured to follower shaft 32 on one end and slidably rides guide rail 33 on the other end. A return stroke collar 35 and an advance stroke collar 36 are affixed onto guide rail 33 and serve to determine the length and position of the stroke of drive shaft 31. Microswitch 37 is electrically connected to clamp air cylinder 60 through a solenoid (not shown) and is mounted on plate member 21 and is arranged so that its contact is actuated by return stroke collar 35. The forwardmost end of drive shaft 31 is suitably rigidly secured to ribbon bonding assembly 38 which accordingly reciprocates with drive shaft 31. It is, of course, possible to substitute any of a number of equivalent motive means to effect the reciprocating action required of motor means 29, and such alternatives are contemplated.

Ribbon bonding assembly 38 which heat bonds the ribbon structure at spaced points comprises a clamp frame 39, clamp air cylinder 45 and sealing pad assembly 47. Clamp frame 39 is an open generally rectangular boxlike frame member without a bottom frame. One forward leg member 40 is provided with an elongated clamp foot 41, the ends of which are slightly upwardly bent. Each of the leg members, 40 and 40a of clamp frame 39 (or a supporting plate, as shown in FIGS. 1 and 2) is provided with an aperture 42 through which slide rods 43 which are affixed to base member 11 are passed and which guide clamp frame 39 as it reciprocates. Microswitch 44 is electrically connected to cutoff air cylinder 71 through a solenoid (not shown) and is mounted on base member 11 and the contact thereof is actuated by clamp foot 41 as it passes thereover during the forward and backward movement of clamp frame 39.

Clamp air cylinder 45 is securely attached to clamp frame 39 and has a drive shaft 46, to the end of which is suitably affixed sealing pad assembly 47. Sealing pad assembly 47 comprises a support channel 48 having upturned flanges 49 along the longitudinal edges thereof. Heater support plate 50 is carried by upturned flanges 49 within support channel 48 and is coextensive with said channel. Sealing pads 51, 52 and 53 are in turn carried by support plate 50 and are affixed thereto as with bolts 54 and angular support brackets 55. As will be clearly seen in FIG. 4, sealing pads 51, 52 and 53 are prisms having six faces and two ends, the cross section of which has a compound shape of a rectangle on a trapezoid, but may take any number of shapes. These sealing pads 51, 52 and 53 are constructed of a heat-conducting material, e.g., aluminum. In the embodiment shown in the drawings, the bottom or ribbon contacting face of sealing pads 51, 52 and 53 is a rectangle whose lengthwise dimension is perpendicular to the ribbon length and whose crosswise dimension is approximately one-eighth inch. In addition, sealing pads 52 and 53 are provided with rectangular relief slots such as 53a at their midpoints, said relief slots being slightly wider than the drawstring. Brackets 55 are insulated from sealing pads 51, 52 and 53 by a suitable insulating material such as asbestos sheeting 56. A suitable thermostatically controlled electric heating element 57 is provided in the apex of sealing pads 51, 52 and 53.

Clamp bed 58 is affixed at about the midpoint of each leg member of clamp frame 39, as by welding, and is generally U-shaped with the legs of the U downwardly inclined. A resilient thermal and mechanical insulating pad 59, e.g., of nylon, is adhesively or otherwise attached to the exposed upper surface of clamp bed 58.

While heat bonding and means for accomplishing same have been described herein, it is possible to bond the ribbon materials by other means such as with adhesives, adhesive tape or strip material and by solvent bonding particularly since the bonded areas are completely concealed in the completed bow form.

Ribbon advancing means 60 comprises a shaft 61, one-way bearings 62 which transmit torque to shaft 61 only for clockwise rotation, a free bearing 63, a pulley 64, pulley belt 65 and a rubber drive wheel 66 securely fastened to shaft 61. In the embodiment shown in FIG. 5, ribbon advancing means

60 is mounted onto base 11 by supporting members 67. Ribbon guide 68 in the form of a channel with turned in edges (C-shaped) is located immediately beneath rubber drive wheel 66 and is carried on one end by brace member 69 which spans and is attached at its ends to supporting members 67. At the other end, ribbon guide 68 is affixed to ribbon cutoff means 70.

Ribbon cutoff means 70 comprises an air cylinder 71 having a drive shaft 72 to which is affixed cutoff assembly 73. Cutoff assembly 73 comprises a mounting block 74 into which is removably inserted cutting dies 75a and 75b. Cutting dies 75a and 75b are typically fabricated out of stainless steel blade stock and are provided with apertures for attachment to mounting block 74 with screws. Cutting die 75a is arranged perpendicular to the direction of travel of the ribbon materials and cutting die 75b is arranged at an angle of about 45° to the direction of travel. The exhaust manifold of air cylinder 71 is connected to a length of hose 76, the free end of which is placed adjacent cutting dies 75a and 75b so that ribbon chips left in the cutting operation may be blown clear. Anvil 77 is affixed to frame 78 of ribbon cutoff means 70 and is provided with a resilient pad, e.g., of nylon, to protect cutting dies 75a and 75b against excessive wear. Another equally effective method of cutting the composite ribbon structure is by the use of "scissor blades," wherein one set of blades is mounted in fixed position onto frame 78 and the other set of blades is mounted onto mounting block 74.

In operating the bow forming machine 10 of the present invention, a suitable air supply source (not shown) is connected to motor means 29, clamp air cylinder 45 and cutoff air cylinder 71. A suitable electrical power source is provided for heating elements 57 of sealing pads 51, 52 and 53.

Ribbon material 101 and 102, which may be of a single-sided construction or of double-sided construction, in roll form are mounted onto ribbon spindles 22 and 23, respectively. Ribbon roll 101 is mounted as shown in FIG. 1 to feed the ribbon with its decorative side uppermost; ribbon roll 102 is mounted to feed the ribbon with its decorative side facing downward. Drawstring material 103 is mounted on spindle 24 and may be mounted to feed in either direction. Drawstring material 103 shown in the drawings is a thin narrow strip material of the type commonly used in "easy open" packages but may, of course, be a string or thread.

When the air supply and electrical power is turned on, the drive shaft 31 of reciprocating air motor 29 is caused to travel back and forth in linear fashion. The length and position of the strokes are governed by the position of the return stroke collar 35 and advance stroke collar 36. Ribbon bonding assembly 38 which is securely fastened to the air motor drive shaft 31 is likewise caused to reciprocate in similar fashion.

Ribbons 101 and 102 and drawstrings 103 are fed around and through guide members 25, 26 and 27, respectively, and then through one-way brake 104, thence between sealing pads 51, 52 and 53 and clamp bed 58, and under drive wheel 66 of ribbon advancing means 60.

When the air supply and electrical power source is turned on with the bow forming machine 10 at the position shown in FIG. 1, drive shaft 31 and ribbon bonding assembly 38 advances (toward the left in FIG. 1) with sealing pad assembly 47 in the down position pressing the composite of ribbons 101 and 102 and drawstring 103 against clamp bed 58. Sealing pad assembly 47 was moved to its down position by the actuation of microswitch 37 by return stroke collar 35. As ribbon bonding assembly 38 advances, pulley belt 65, one end 80 of which is fastened to rear clamp frame leg 40a, causes rubber drive wheel 66 to rotate in the clockwise direction thus advancing ribbons 101 and 102 and drawstring 103 within ribbon guide 68 toward and through ribbon cutoff means 70. As drive shaft 31 and clamp frame 38 continues its forward motion, clamp foot 41 rides over and trips microswitch 44. However, since microswitch 44 is connected in series with microswitch 37, which at this moment is still in an actuated position, microswitch 44 does not actuate cutoff air cylinder 71. At the

forwardmost travel of drive shaft 31, collar 34 on follower shaft 32 engages advance stroke collar 36 thus driving guide rail 33 and return stroke collar 35 forward thereby deactivating microswitch 37 and causing clamp air cylinder 45 to raise sealing pad assembly 47. It will be seen that sealing pad assembly has been in the operative (down) position for the duration of the entire advance stroke. Thus, the composite of ribbon 101 and 102 and drawstring 103 is heat bonded together at bond areas 111, 112 and 113, by the action of heat from heat elements 57 in sealing pads 51, 52 and 53, the pressure between said sealing pads and clamp bed 58 and the dwell time, which is determined by the duration of the advance stroke. It is obvious that the temperature range of heater elements 57, the amount of pressure applied by sealing pads 51, 52 and 53 and the dwell time must be determined from the characteristics of the ribbon materials 101 and 102. For "Sasheen Brand" ribbon material, a temperature of about 400° F., a clamp air cylinder pressure of about 50 p.s.i. gauge and a dwell time of about 4 seconds was found to provide satisfactory bonds between ribbons 101 and 102. The deactivation of microswitch 37 now completes the series circuit to microswitch 44 which, however, is in a deactivated position at this time since clamp foot 41 has passed beyond microswitch 44.

After drive shaft 31 has reached its forwardmost point, drive shaft 31 begins its return stroke. frame 38, of course, also begins to move in the return direction. Clamp foot 41 again rides over and trips microswitch 44 actuating cutoff air cylinder 71 to bring cutting dies 75a and 75b into contact with the ribbon structure. After clamp foot 41 passes beyond microswitch 44, microswitch 44 is again deactivated.

Pulley belt 65, the other end 81 of which is fastened to leg 40, rotates pulley 64 in a counterclockwise direction but does not rotate shaft 61 and rubber drive wheel 66 due to one-way bearings 62.

One-way brake 104 comprising a leaf spring which bears against the surface of clamp bed 58 grips the composite ribbon structure and causes it to travel along with clamp frame 38 during the advance stroke. One-way brake 104 freely allows the ribbon structure to slide with respect to the clamp bed 38 in the reverse stroke direction. One-way brake 104 also isolates the rearmost sealing pad 53 from the unwind tension zone thus eliminating possible distortion, elongation or fracture of the ribbons 101 and 102 and drawstring 103 during the bonding operation. One-way brake 104 may also take the form of an eccentrically mounted roll having one or more O-rings of rubber or other high-friction material mounted on the roll for contact with the ribbon material.

Ribbon cutoff means 70, as previously noted, is actuated when clamp foot 41 passes over microswitch 44 on the return stroke. Cutting dies 75a and 75b are arranged so that a straight cut transverse to the ribbon is effected at the leading edge of the bow structure on the incoming side of the die and an angular cut (about 45°) on the trailing edge of the bow structure leaving the die. The transverse cut is effected at the leading edge of the heat-seal bond made by the forwardmost sealing pad 51. The substantially right triangular ribbon chips and the short length of the drawstring produced in the cutting operation is blown clear by the exhaust pulse produced from cutoff air cylinder 71 through hose 76.

The completed prebows 110 are allowed to fall from ribbon cutoff means 70 down chute 105 into a catch box 106, which may be a packing container for the prebows.

As will be clearly seen from FIG. 8, the prebow 110 comprises two strips of ribbon material 101 and 102, of the same or different colors, and a drawstring 103 bonded together at three spaced points 111, 112 and 113. The bonded area 111 is continuous and extends across the entire width of prebow 110. In contrast bonded areas 112 and 113, although extending across the width of prebow 110, is segmented at the midpoint so that drawstring 103 is constrained by the bonded areas 112 and 113 but not bonded thereby. Segmented bonds 112 and 113 are formed by the middle and rear sealing pads 52 and 53

which are provided with relief slots such as 53a (FIG. 3) at their midpoints.

One method of forming the tailored bow 115 of the present invention is as follows: ribbon material 101 (or 102) is grasped between the thumb and index finger of one hand immediately below bonded area 113 (as seen in FIG. 9) with either the thumb or index finger inserted between the two strips of ribbon material 101 and 102, and with the remaining three fingers on the opposite side of ribbon material 102 (or 101). Drawstring 103 is then grasped between the thumb and index finger of the other hand and gently pulled. As drawstring 103 is thus gradually pulled, loops 116 will be formed by the ribbon material between bonds 113 and 112 immediately above bond 113. As the pulling is continued, loops 117 will be formed by the ribbon material between bonds 112 and 111 immediately above and in an aligned and stacked relationship to loops 116. When drawstring 103 is pulled to its full extent such that bonds 113, 112 and 111 are tightly pressed together in stacked relationship, the bow is regrasped by moving the thumb over and onto superimposed bonds 111, 112 and 113 and the remaining fingers are placed immediately between ribbon 101 and 102. At that point, drawstring 103 may be cut off at bond 113 or may be forcefully pulled whereupon it will be released from bond 111. The thus formed bow can be fastened together by various means at its center so as to restrain the ribbons from returning to their original flat position. A decorative band 118 in the form of a bend-over strip or decorative ribbon material is placed around the loop stack at the bow center to conceal bond areas 111, 112 and 113 to thus form the completed tailored bow 115. The decorative band 118 may be provided with a pressure-sensitive adhesive coating protected by a covering strip to provide a convenient means of adhering the bow 115 to a package.

Another and perhaps easier method of forming bow 115 is to grasp drawstring 103 immediately beneath bond 113 with the fingers of one hand while holding drawstring 103 at its extreme end in the other hand and pushing against bond 113 until loops 116 and 117 are formed and accumulated in stacked relationship. The bow 115 is then completed as hereinabove described.

Referring now to FIG. 11 which diagrammatically illustrates apparatus for producing prefabricated pompon bow forms or prebows, the apparatus will be seen to comprise ribbon spindles 122 and 123 and drawstring spindle 124. Ribbon guide members 125, 126 and 127 in the form of spindles are also provided. Ribbon guide member 127 is additionally provided with a grooved central section (not shown) which acts as the drawstring guide and centering means. In the specific embodiment illustrated, two pairs of driven squeeze rolls 128 and 129 are provided to pull the ribbon materials through the machine. Two additional pairs of intermittently driven squeeze rolls 130 and 131 provide the means for passing the ribbon and drawstring composite into notcher assembly 132, momentarily stopping said composite in notcher assembly 132 at which time the composite is suitably notched, and pulling the notched segment out of notcher assembly 132, the next segment of ribbon and drawstring composite being passed into said notcher assembly. Another pair of driven squeeze rolls 133, driven at the same speed as squeeze rolls 128 and 129, acts to tension the ribbon prior to its being wound onto windup roll 134, also driven at about the same speed as squeeze rolls 133. The machine also includes ribbon bonding assembly 138 which, in the embodiment illustrated, is a double orifice hot melt head which is pulsed to apply two spaced dots of hot adhesive onto one surface of ribbon, the spacing between the dots of adhesive being such that the drawstring will not be bonded to the ribbon. A single orifice hot melt head 139 which is also pulse regulated applies a single dot of adhesive centrally disposed across the ribbon width at the starting point of each prebow to bond the drawstring to the ribbon.

It will be understood that suitable motor means is provided to drive the squeeze rolls 128, 129, 130, 131 and 133, notcher assembly 132 and windup roll 134. In addition, the motor

means may also be used to pulse the hot melt heads 138 and 139 through appropriate cam or other mechanical means. Alternatively, the hot melt heads 138 and 139 may be pulsed through an appropriate electrical timer.

The machine illustrated in FIG. 11 operates in substantially the following manner. Ribbon materials 201 and 202, which may be of either single-sided or double-sided construction, in roll form are mounted onto ribbon spindle 122 and 123 respectively. Where single-sided ribbon material, which is the preferred material, is used, the ribbon rolls 201 and 202 are mounted as shown so that the decorative side of the ribbon is outermost. Drawstring material 203 is mounted on spindle 124 and may be mounted to feed in either direction.

Ribbons 201 and 202 and drawstring 203 are threaded around guide members 125, 126 and 127, respectively, and thence successively through squeeze rolls 128 and 129; a slack loop being formed between squeeze rolls 129 and the composite of ribbons 201 and 202 and drawstring 203 is fed through squeeze rolls 130 and into and through notcher assembly 132, through squeeze rolls 131 and 133 with a slack loop therebetween.

With the appropriate power sources turned on, driven squeeze rolls 128 and 129 begin to pull ribbons 201 and 202 and drawstring 203 through the machine. Double-orifice hot melt head 138 is actuated and applies two spaced dots of adhesive 211 and 212 on the upper surface of ribbon 202. Single-orifice hot melt head 139 is actuated to apply a dot of adhesive 213 centrally of dots 211 and 212 on the upper surface of ribbon 202. When ribbon 202 with adhesive dots 211, 212, and 213 applied thereto reaches squeeze rolls 128, drawstring 203 and ribbon 201 are superimposed thereupon and are bonded together during passage through squeeze rolls 128. Squeeze rolls 128 may, if desired, be chilled to accelerate bonding of the composite of ribbons 201 and 202 and drawstring 203. The thus-bonded composite then passes through squeeze rolls 129 and 130 and into notcher assembly 132. Notcher assembly 132, through appropriate cams or other mechanical or electrical means is actuated to notch the bonded composite of ribbons 201 and 202 and drawstring 203 with a pair of notches 214 and 215, the notches being located such that substantially all of the ribbon material immediately outward of adhesive dots 211 and 212 is excised in the notching process. The notches which are shown in the drawing to be semicircular may of course take other shapes. The notched composite then passes through squeeze rolls 131 and 133 and is then wound onto windup roll 134. Squeeze rolls 130 and 131 are geared or equivalently equipped to briefly intermittently stop to permit notcher assembly 132 to be actuated.

Prebow 210 is typically fabricated to comprise 10 segments of ribbon to produce a pompon bow having 20 loops. The number of loops may, of course, be varied to produce pompon bows having any desired degree of "fullness." For a 20-loop pompon bow the single-orifice hot melt head 139 would be sequentially actuated at the beginning of the operating cycle (as hereinabove described) and again after each 10 actuating cycles of double-orifice hot melt head 138. Double-orifice hot melt head 138 would be actuated to place adhesive dots 211 and 212 at selected equidistantly spaced points along the length of ribbon 202. The spaced points would, of course, be selected so as to produce loops having the desired length. For example, if one desired to produce a pompon bow having 5-

inch loops, the double-orifice hot melt head 138 would be actuated to place adhesive dots 211 and 212 at 5-inch intervals. At each 55-inch interval, single-orifice hot melt head 139 would be actuated to place adhesive dot 213 centrally of adhesive dots 211 and 212 so that drawstring 203 would be bonded to the ribbons 201 and 202 to produce prebows in a continuous process.

In one method of fashioning a pompon bow from prebow 210, a single prebow consisting of a fully bonded end 216 (i.e., the end wherein the drawstring 203 is bonded to the ribbons 201 and 202) and 10 segments of ribbon wherein the drawstring is unbonded to the ribbons, unwound from the supply roll of prebows fabricated as above described and cut off therefrom, is grasped with the fingers of one hand at the bonded area farthest removed from fully bonded end 216 such that the ends of ribbons 201 and 202 are separated and drawstring 203 is exposed. Drawstring 203 is then grasped between the thumb and index finger of the other hand and steadily pulled to form loops L from the ribbon segment between the bonded areas. In the formation of loops L, the notches 214 and 215 permit the loops to rotate and orient themselves to form pompon bow 217, the individual loops L thereof being uniformly dispersed about the center of the bow. After loops L have been formed and accumulated and pompon bow 217 formed, the drawstring is securely fastened at the bottom of the bow. This can be conveniently accomplished with a small square card (not shown) having a slot therein to its approximate midpoint, the drawstring then being wound about said card and inserted into the slot where it is frictionally retained. The card may have a pressure-sensitive adhesive coating on one side thereof protected by a suitable liner material for easy attachment of the completed pompon bow 217 to a package.

What is claimed is:

1. A prefabricated bow form for a formal bow formed from two lengths of ribbon and a drawstring, said ribbons being in superimposed back to back relationship with said drawstring centrally interposed therebetween, said ribbons and drawstring being firmly bonded together at a first bonded narrow elongate rectangular area at one end of said bow form, said ribbons being bonded together in a narrow elongate segmented rectangular bond at at least two other spaced points along the length of the composite of ribbon and drawstring, said drawstring being unbonded to said ribbons but being constrained by said at least two other segmented bonds, said at least two other spaced points being progressively increasingly removed from said first bonded area and being intermediate the other end of said bow form such that a length of the composite of ribbon and drawstring extends from the last of said at least two other bonds.

2. A prefabricated bow form for a pompon bow formed from two lengths of ribbon and a drawstring, said ribbons being in superimposed back to back relationship with said drawstring centrally interposed therebetween, said ribbons and drawstring being firmly bonded together at one end of said bow form, said ribbons being bonded together at a plurality of spaced points along the length of the composite of ribbons and drawstring, said drawstring being unbonded to said ribbons but being constrained by said bonded ribbons, said ribbons being notched at each of said bonded areas along their lengths.

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