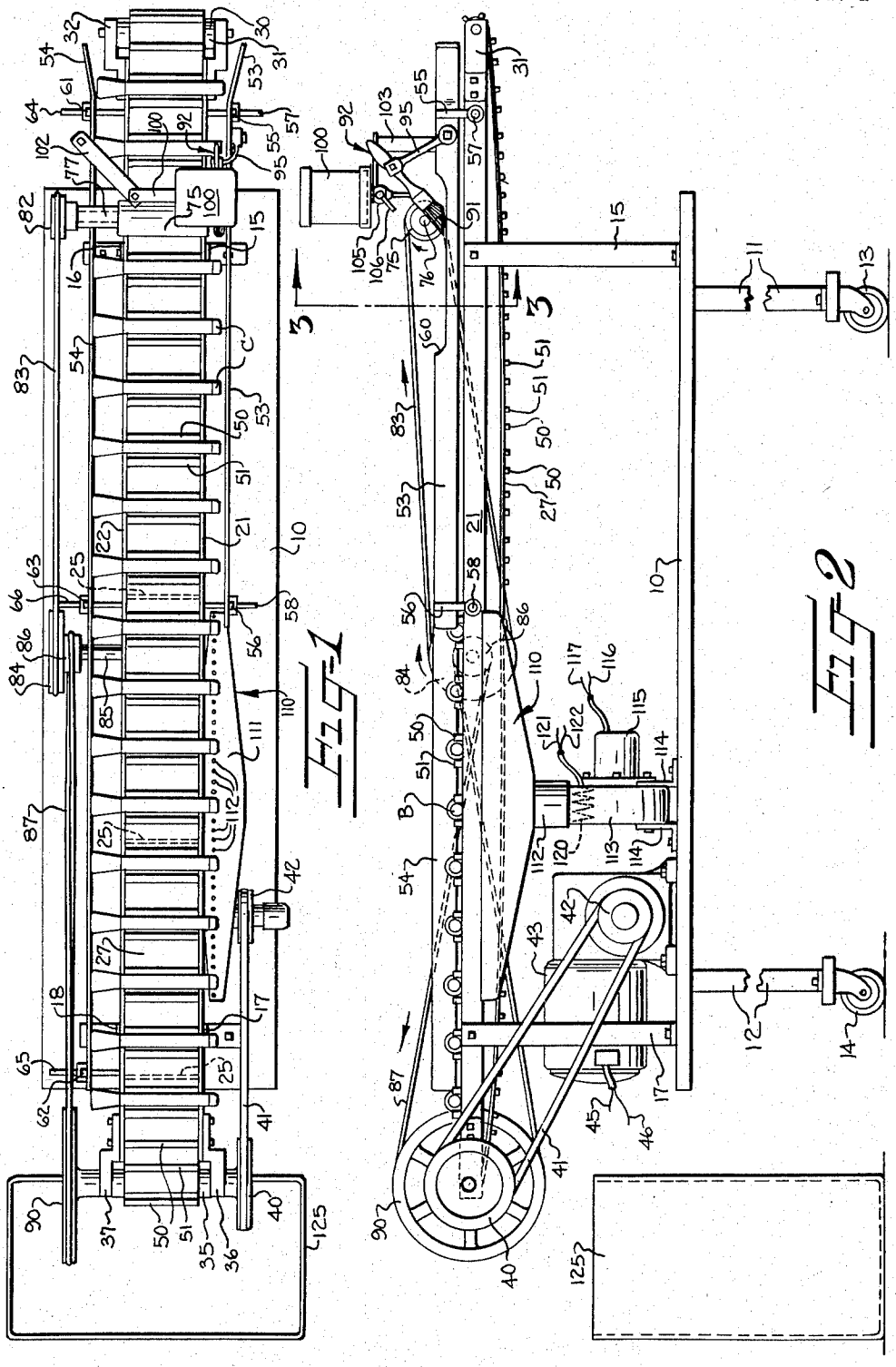
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BOBBIN TIP PAINTING APPARATUS

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BOBBIN TIP PAINTING APPARATUS

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Fig-3

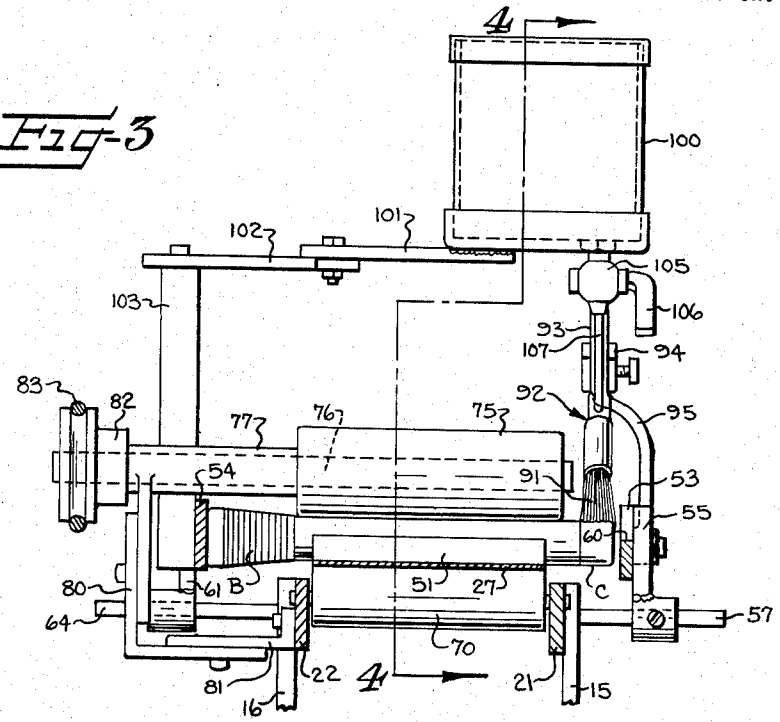
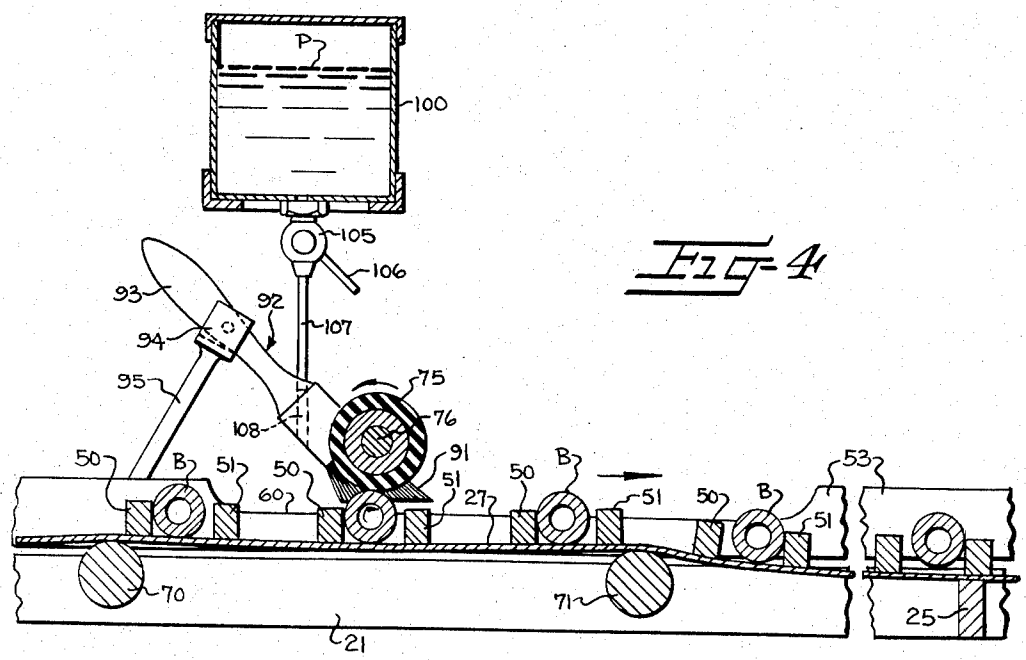


Fig-4



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BOBBIN TIP PAINTING APPARATUS

Filed July 1, 1957

3 Sheets-Sheet 3

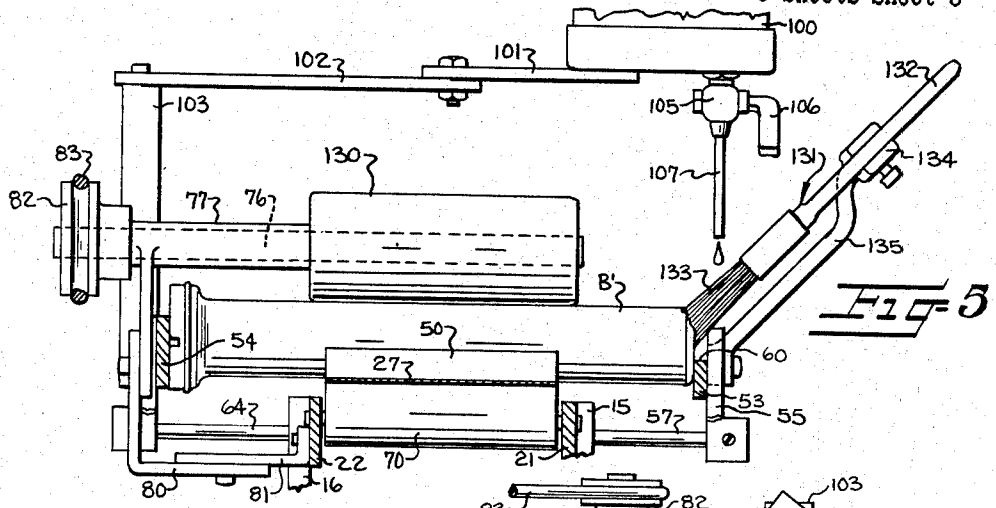


Fig-5

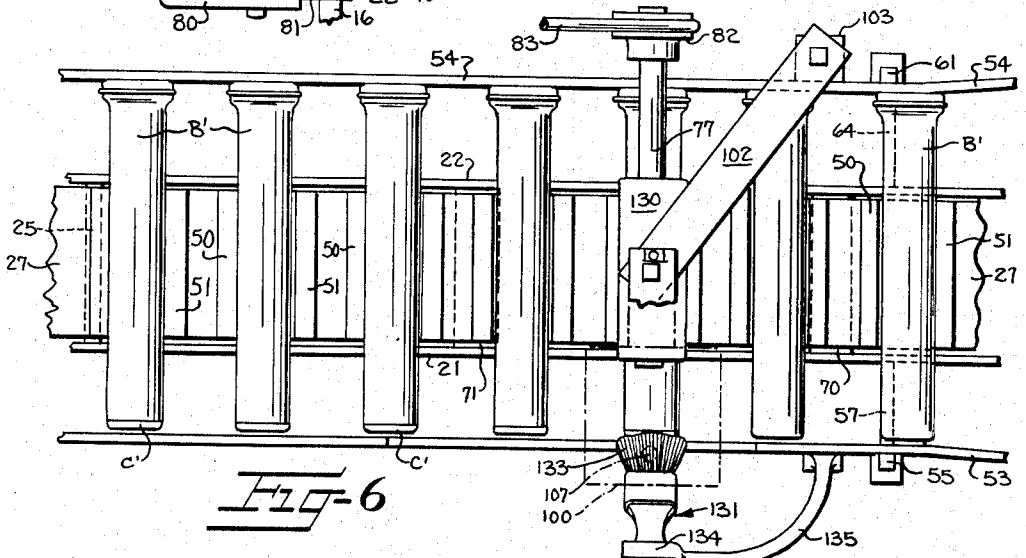


Fig-6

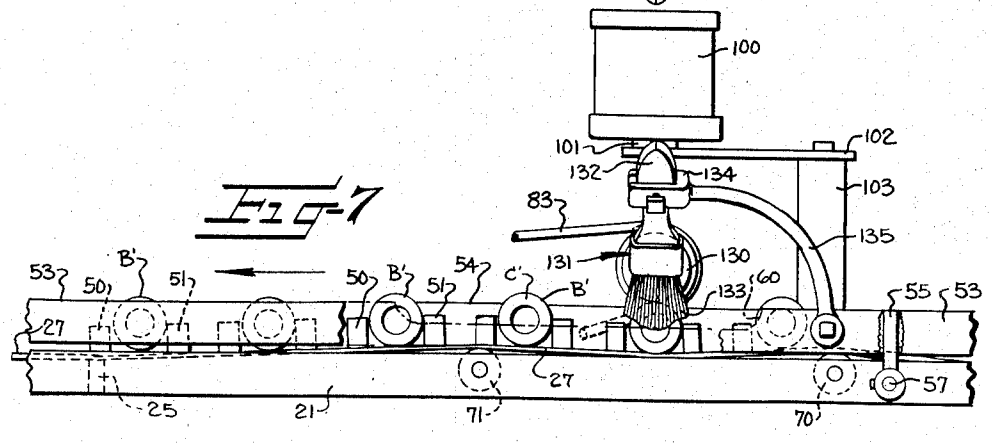


Fig-7

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2,900,954

BOBBIN TIP PAINTING APPARATUS

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Application July 1, 1957, Serial No. 669,214

2 Claims. (Cl. 118—232)

This invention relates to an apparatus for and a method of painting an identifying mark or band of color material on the end of bobbins, spools and other types of yarn holders whereby the identifying color serves to identify different types of thread or yarns wound thereon.

Most present day mills use a large variety of different types of yarn and to avoid confusion and costly mistakes in the selection of the proper type of yarn for a particular operation, it is important that some method of instantly identifying the different types of yarn be employed. The most common practice is to apply an identifying color material, such as paint, to the end or tip of the bobbin which is always exposed, even when yarn is wound on the bobbin. The usual practice is to paint the tips of the bobbins by hand and stack the bobbins on racks, shelves or the like to dry so that the freshly painted tips do not touch each other. Painting the tips by hand is a slow and tedious job and the stacking of the bobbins requires a great deal of space which could be used to greater advantage for other mill operations. Also, when the identifying color bands are applied by hand, they often are not uniform as to the width of the bands applied or to the amount of paint applied and, since the paint is usually allowed to dry while the bobbins are in a stationary position, any excess paint flows to the lower side to dry in a drop and results in a rough end on the bobbin. A rough bobbin tip may cause the yarn to break or change the amount of tension on the yarn as it is pulled off of the bobbin and over the painted tip or end.

It is an object of this invention to provide an apparatus and a method for automatically marking the ends or tips of elongated cylindrical objects, such as bobbins, quickly and efficiently with equal amounts of paint on each successive bobbin and wherein each identfying mark or band of color applied will be identical to the band on succeeding bobbins.

It is another object of this invention to provide an apparatus for automatically applying identifying color to the tips of succeeding bobbins fed to the apparatus wherein the bobbins are conveyed in a straight path first to a color applying station, next to a drying station and then discharged from the apparatus into a suitable container. The bobbin conveying means, the color applying station, and the drying station are each provided with means for adjustment to adapt the apparatus to apply color to a wide range of different size bobbins.

It is a more specific object of this invention to provide an apparatus and method of applying identifying marks or painted rings on the tip of elongated articles, such as yarn bobbins by continuously conveying succeeding bobbins in a substantial straight line past a paint applying station where the bobbins are rotated simultaneously as the paint is applied to the bobbin tip, next rotating the bobbins a second time while applying heated air to the painted tip of the bobbin to completely dry the painted tip, and then depositing the painted and dried

bobbins into a suitable bobbin collector box at the end of their straight line path of travel.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is a plan view of the bobbin tip painting apparatus and showing the bobbin collector box at one end of the apparatus;

Figure 2 is a side elevation of the apparatus shown in Figure 1;

Figure 3 is an enlarged transverse vertical sectional view through the paint applying station and being taken substantially along the line 3—3 in Figure 2;

Figure 4 is a fragmentary longitudinal vertical sectional view taken substantially along the line 4—4 in Figure 3;

Figure 5 is a view similar to Figure 3 except showing some of the parts in different positions and some parts modified with the apparatus applying paint to a different type bobbin;

Figure 6 is a fragmentary plan view of the paint applying station shown in Figure 5;

Figure 7 is a fragmentary side elevation of the paint applying station shown in Figure 6, with parts broken away.

Referring more specifically to the drawings, the numeral 10 denotes a suitable table upon which the bobbin tip painting apparatus is mounted and which is provided with suitable pairs of front and rear legs 11 and 12 having respective casters 13 and 14 mounted on the lower ends thereof to facilitate moving the apparatus from one position to another readily. The front or feed end of the bobbin tip painting apparatus is supported above and in spaced relation to the top of the table 10 on a pair of front legs 15 and 16 and at its rear or discharge end on a pair of support legs 17 and 18 (Figures 1 and 2). The support legs 15 and 17 are suitably secured at their lower ends to the table top 10 and at their upper ends adjacent opposite ends of one side of a longitudinally extending conveyor frame member 21. The support legs 16 and 18 are suitably secured adjacent their lower ends on the top of the table 10 and at their upper ends adjacent opposite ends of one side of a longitudinally extending conveyor frame member 22. The frame members 21 and 22 are spaced apart from each other and secured in spaced relationship by a plurality of transversely extending, longitudinally spaced support members 25 (Figures 1 and 4) opposite ends of which are fixed to the frame members 21 and 22.

An endless pliable conveyor 27 is adapted to pass between the longitudinal frame members 21 and 22 and is rotatably mounted at its front end on a suitable roller 30 rotatably mounted at opposite ends in bearings 31 and 32 which are fixed adjacent the front ends of the respective frame members 21 and 22. The opposite or rear end of the conveyor 27 passes around a driven roll 35 rotatably mounted in bearings 36 and 37 which are fixed adjacent the rear ends of the respective frame members 21 and 22. The shaft, not shown, of the driven roll 35 extends outwardly beyond the bearing 36 and has a pulley 40 fixed thereto which is continuously driven by an endless belt 41 which also passes around a pulley 42 fixed on the drive shaft of a gear reduction electric motor 43. The electric motor 43 is suitably mounted on the top of the table 10 and is provided with electric wires 45 and 46 (Figure 2) which extend to any suitable source of electrical energy, not shown.

The conveyor belt 27 is provided with a plurality of bobbin carrying lugs 50 which are equally spaced apart from each other and fixed to the outer surface of the conveyor belt 27 by any suitable means such as nails,

staples, screws or the like. A second plurality of bobbin guide lugs 51 are spaced between each of the bobbin guide lugs 50 (Figures 1, 2 and 3) to define bobbin holding pockets on the conveyor belt 27. Thus, when a bobbin, indicated at B, is placed in front of each of the bobbin guide lugs 50 at the front or feed end of the conveyor belt, the bobbins will be loosely confined in the pocket between the lugs 50 and 51 and be carried by the conveyor belt 27 towards the rear end of the apparatus or from right to left in Figures 1 and 2.

The transverse position of the bobbins B relative to the path of travel of the conveyor belt 27 is controlled by a bobbin tip guiding plate 53 and a bobbin head guiding plate 54 each of which is spaced outwardly of the respective longitudinally extending frame members 21 and 22. The bobbin tip guide plate 53 is provided with an outwardly flanged front end and is supported for transverse adjustment relative to the frame member 21 on the upper end of support brackets 55 and 56 fixed adjacent opposite ends of the guide plate 53. The lower ends of the brackets 55 and 56 are adjustably secured on suitable rods 57 and 58, the inner ends of which are fixed in the side of the frame member 21 (Figures 1 and 3). The upper edge of the bobbin tip guiding plate 53 is cut away as at 60 (Figures 2 and 3) to facilitate operation of the paint applying apparatus, to be later described.

The bobbin head guide plate 54 has an outwardly flanged front end and is suitably supported for transverse adjustment relative to the conveyor belt 27 adjacent opposite ends on the upper ends of support brackets 61 and 62 and intermediate its ends on the upper end of a support bracket 63 (Figure 1.) The lower ends of the brackets 61, 62 and 63 are adjustably mounted on respective rods 64, 65 and 66, the inner ends of which are suitably secured in the side of the longitudinal frame member 22.

It will be noted by referring to the right-hand portion of Figure 4 that the upper reach of the conveyor belt 27 normally travels at a slightly lower elevation than the level of the top edges of the frame members 21 and 22 and the lower surface of the belt 27 is supported by the support members 25. With the upper surface of the belt 27 lower than the level of the top edges of the frame members 21 and 22, the bobbins B will be rolled along the members 21 and 22 by the guide lugs 50. As the belt 27 approaches the paint applying station, to be later described, its upper reach is raised slightly and maintained at a slightly higher level than the level of the tops of the frame members 21 and 22 as it passes over a pair of longitudinally spaced transversely extending rolls 70 and 71, opposite ends of which are rotatably mounted in the longitudinal frame members 21 and 22. Thus, the bobbins B are normally rolled along the upper surfaces of the frame members 21 and 22 so that the frame members 21 and 22 may also be termed trackways along which the bobbins B are rolled by the lugs 50 on the conveyor belt 27.

While the bobbins B are out of engagement with the trackways 21 and 22, by the rolls 70 and 71 raising a portion of the belt 27, the bobbins B engage a continuously driven resilient roll 75 which rotates the bobbins B supported on the belt 27 and confined between the lugs 50 and 51. The roll 75 is fixed on one end of a transversely extending shaft 76 which is rotatably mounted intermediate its ends in a bearing member 77 and the bearing member 77 is supported for vertical adjustment on the vertical arm of an L-shaped bracket 80 (Figure 3). The horizontal arm of the L-shaped bracket 80 is adjustably mounted on the outer end of a bracket 81 fixed to the frame member 22 to provide transverse adjustment for the bearing 77 and roll 75.

The end of the shaft 76 remote from the roll 75 has a pulley 82 fixed thereto which is driven by an endless belt 83 passing partially around and driven by a pulley 84 which is rotatably mounted on the outer end of a stub shaft 85, the inner end of which is fixed in the side frame member 22. The pulley 84 has a smaller pulley 86 integral therewith and which is driven by an endless drive belt 87 passing partially around a relatively large pulley 90 fixed on the end of the shaft supporting the driven conveyor support roll 35 (Figures 1 and 2). Thus, any time that the electric motor 43 is actuated to drive the conveyor 27, the resilient covered bobbin drive roll 75 will be rotated to engage and rotate successive bobbins B brought into engagement therewith by the conveyor belt 27 (Figure 4).

As each bobbin B is brought and rotated by the roll 75, the bristles 91 of a paint brush 92 engage the end of the rotating bobbin B (Figures 3 and 4) The paint brush 92 is suitably supported by a handle portion 93 adjustably secured in a clamp member 94 fixed on the upper end of an arm 95, the lower end of which is suitably secured to the outside surface of the bobbin tip guide plate 53.

A reservoir or supply tank 100 adapted to hold a supply of paint P is suitably supported on one end of an arm 101, the other end of which is adjustably secured to one end of a second arm 102 and the other end of which is fixed on the upper end of a support post 103 while the lower end of the support post 103 is fixed to the outside surface of the bobbin head guide plate 54. The paint P is fed from the reservoir 100 through an adjustable metering valve 105, which has a flow regulating handle 106 therein, and into a supply line 107 connected at one end to the valve 105 and the opposite end of which is embedded in the handle 93 of the paint brush 92. A drilled hole 108 is provided in the paint brush 92 to supply the paint P from the line 107 to the bristles 91 of the brush at the desired rate so that the paint will be applied to the end of the bobbins B (Figures 3 and 4) as each bobbin engages and is rotated by the roll 75.

The upper end of a duct 110 is provided adjacent the longitudinal frame member 21 (Figures 1 and 2), and has a flat relatively long narrow upper surface 111 extending parallel to the path of travel of the painted ends of the bobbins B. The upper surface 111 of the duct 110 is provided with a plurality of holes or openings 112 therein for directing heated air from the duct 110 upwardly against the painted tips of the bobbins B as the bobbins B pass thereabove. The duct 110 is connected, as by a coupling 112, to the outlet side of a suitable blower 113 mounted for transverse adjustment on brackets 114 fixed on the table 10. The blower 113 is driven by an electric motor 115 mounted thereon and having suitable electric wires 116 and 117 which may be connected to a suitable source of electrical energy, not shown. The air passing from the blower 113 and through the duct 110 may be heated to speed up the drying of the paint on the bobbins B by a suitable heating element 120 (Figure 2) mounted in the output side of the blower 113 and heated by electrical energy through respective electric wires 121 and 122 connected to the element 120 and to any suitable source of electrical energy, not shown.

In operation, an operator lays a bobbin B in front of each lug 50 so that the bobbin is confined in the pocket formed by the lugs 50 and 51 on the conveyor bolt 27 and the bobbins are positioned transversely on the belt 27 as they pass between the guide plates 53 and 54. As the conveyor belt 27 carries the bobbins B in the direction of the arrow in Figure 1, the upper reach of the conveyor belt 27 will be raised by the rolls 70 and 71 (Figure 4) to raise the bobbins B upwardly so that the ends thereof will be out of engagement with the longitudinal frame members or trackways 21 and 22. While being carried in a raised position, each succeeding bobbin B will be rotated on the conveyor belt 27 as it is engaged by the rotating resilient bobbin driving roll 75 and at the same time, the bristles 91 of the paint

brush 92 will engage the tip end of the rotating bobbin B to apply an even coat of paint thereto (Figures 3 and 4). The paint is applied in a band, indicated at C, which in this case extends from the tip end of the bobbin B and towards the head end of the bobbin B (Figure 3).

As the conveyor belt 27 carries each bobbin B from beneath the roll 75 and the bristles 91 of the paint brush 92, the upper reach of the conveyor belt 27 is again lowered upon passing over the roll 71 (Figure 4) so that the bobbin B contacts the upper surfaces of the frame members or trackways 21 and 22 to lift the bobbin B out of engagement with the belt 27. The bobbin B will be rolled along the upper surface of the frame members 21 and 22 as it is pushed by the lug 50 on the moving conveyor belt 27. The rolling bobbins B thus tend to even out and further distribute the paint applied at the paint brush 92 since any excess paint, which would ordinarily run to the bottom surface of the bobbins, will be carried by the rotating bobbins and evenly distributed prior to drying.

As the conveyor belt 27 continues to roll the bobbins along the trackways 21 and 22 and towards the discharge end of the machine, the painted tips of the bobbins pass over the upper end of the heated air discharging duct 110 so that hot dry air is directed through the openings 111 therein and against the paint on the ends of the rolling bobbins B. Thus, the rotating painted tips of the bobbins are equally exposed on all sides to the heated air from the duct 110 and the complete peripheral painted surface of each of the bobbins is dried evenly and eliminates any problem of storing or stacking the bobbins to dry after painting. As the conveyor 27 passes around the driven roll 35, the bobbins B will fall by gravity into a suitable container such as a bobbin collector or box indicated at 125 in Figures 1 and 2.

In Figures 5 through 7, it will be observed that various parts of the machine have been adjusted to paint the tips of different size bobbins such as those indicated at B'. It will be noted that the diameter of the bobbin B' is larger than was the diameter of the bobbin B and this makes it necessary to raise the vertical position of the bearing member 77 and the shaft 76 and to replace the resilient driven bobbin drive roll 75 with a similar resilient bobbin drive roll 130 which is larger in diameter than the drive roll 75. The larger diameter resilient roll 130 is required in order to rotate the bobbins B' at the same peripheral surface speed as the bobbins B were rotated by the roll 75 while the paint is applied to the tip portion thereof.

Since the bobbins B' are substantially longer than the bobbins B, it is necessary to adjust the bobbin tip guide plate 53 further away from the frame member 21 and adjust the bobbin head guide plate 54 further away from the frame member 22. The drying duct 110 must be moved further away from the frame member 21 so that the heated air will be directed against the ends of the longer bobbins B' and when the bobbin tip guide plate 53 is moved outwardly to guide the longer bobbins B', the paint brush will be moved also since it is fixed on the guide plate 53 and the paint reservoir 100 will have to be adjusted by movement of the arms 101 and 102.

If desired, a paint brush 131 may be positioned as shown in Figures 5 and 6 so that a different portion or the complete end of the bobbins B' may be painted with an identifying band of paint. The paint brush 131 has a handle portion 132 and bristles 133 with the handle 132 mounted in a clamp member 134 fixed on the upper end of a support arm 135, the lower end of which is suitably secured to the outside surface of the bobbin tip guide plate 53 (Figures 5, 6 and 7). The clamp member 134 is positioned to clamp the handle 132 of the paint brush 131 at an angle so that the bristles 133 of the brush engage a portion of the cylindrical body of the bobbins B' and also engage the rounded tip or end of the bobbins B'. With the brush 131 disposed as shown in Figures 5 and 6, the paint supply line 107 is positioned above the bristles 133 of the paint brush 131 so a metered amount of paint will drip on the bristles 133 and the paint dropped thereon will be applied to the bobbins B'.

After the various adjustments have been made, the operator will then place a bobbin B' in front of each of the lugs 51 on the conveyor belt 27. Each succeeding bobbin B' will then be rotated and simultaneously painted, rolled along the trackways 21 and 22 while the paint is dried and dropped into the bobbin collector 125 in the same manner as the bobbins B were painted. The paint is applied in a band, indicated at C', which in this case covers the complete end of the bobbins B' and does not extend onto the barrel of the bobbin (Figures 5 and 6).

The brush 92, as shown in Figures 1 through 4, may be employed to paint the peripheral surface of either type bobbin B or B' and the brush 131, shown in Figures 5 through 7, may be employed to paint the peripheral end of either type of bobbin B or B'. It is to be understood that this invention is not limited to the two particular paint brushes shown or to the positions shown since other types of paint brushes might be positioned to paint strips, tips or bands around the peripheral surface of the bobbin. For instance, several narrow brushes may be positioned to each paint a different color strip on the tip end of each of the bobbins.

It is thus seen that a bobbin painting apparatus and method have been provided which carries out quickly and automatically the operation of painting identifying bands of color and the like on cylindrical objects, such as bobbins. The apparatus carries out the painting of the bobbins while conveying the bobbins continuously in a horizontal plane, raising the conveyed bobbins slightly, rotating the raised bobbins while simultaneously applying paint to the rotating bobbins, lowering the conveyed bobbins to roll the bobbins on spaced trackways, applying heated air to the painted portions of the rolling bobbins to dry the paint thereon, and discharging the bobbins into a suitable container.

In the drawings and specification there have been set forth several embodiments of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. An apparatus for painting an identifying color band on the tips of bobbins comprising a continuously driven endless conveyor having an upper reach normally traveling a straight horizontal path, spaced pairs of upstanding lugs on said conveyor for carrying bobbins placed transversely on said conveyor and between said lugs, the width of the conveyor being less than the length of said bobbins so that opposite ends of the bobbins extend outwardly beyond the sides of the conveyor, a bobbin trackway disposed adjacent each side edge of said conveyor with its upper level being disposed at a higher elevation than the upper surface of the conveyor so that the bobbins are normally supported in rolling engagement by said trackways and rolled along the trackways with movement of the conveyor, conveyor raising means disposed between said bobbin trackways to cause said conveyor to travel a path above its normal path of travel during one portion of its travel to support said bobbins on the conveyor and out of engagement with the trackways, a bobbin engaging paint applicator brush disposed above and adjacent the raised portion of said conveyor for engagement with a portion of the surface of each succeeding bobbin carried by the conveyor, and a continuously driven roll positioned to engage the upper portion of and to rotate each bobbin simultaneously with the application of paint thereto.

2. An apparatus for painting an identifying color band on the tips of bobbins comprising an elongated continuous-

ly driven endless conveyor having an upper reach normally traveling in a substantially horizontal path, spaced pairs of lugs on said conveyor for carrying bobbins placed transversely of said conveyor and between said lugs, said bobbins extending beyond opposite edges of said conveyor, bobbin trackways positioned adjacent opposite edges of said conveyor to normally support said bobbins above the upper reach of said conveyor and in rolling engagement with said trackways with movement of said conveyor, conveyor raising means positioned beneath and intermediate the ends of the upper reach of said conveyor to raise a portion of the upper reach above its normal path of travel and support the bobbins above said trackways, a bobbin engaging paint applicator brush disposed above the raised portion of said conveyor to engage a portion of the surface of each succeeding bobbin carried by the conveyor, and a continuously driven roll positioned to engage the upper portion of and to rotate successive bobbins raised

by the conveyor to simultaneously apply paint to the periphery thereof.

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