Sept. 28, 1943. D. A. JOLLEY ET AL 2,330,494

COATING APPARATUS FOR YARN HOLDERS

Filed Nov. 24, 1941 3 Sheets-Sheet 1

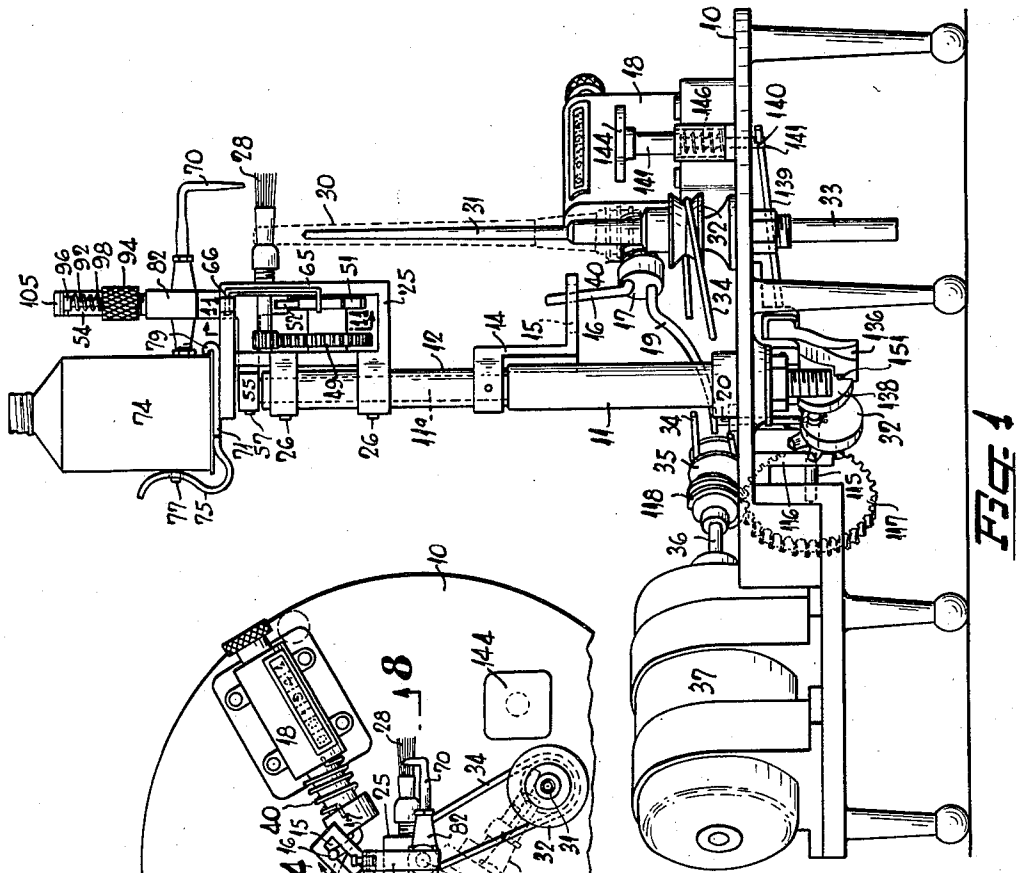


FIG. 1

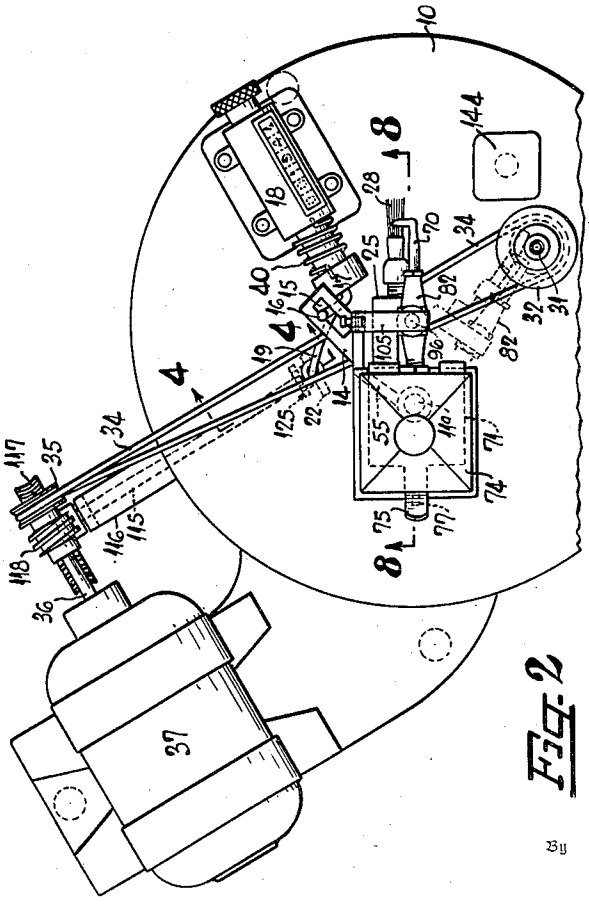


FIG. 2

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COATING APPARATUS FOR YARN HOLDERS

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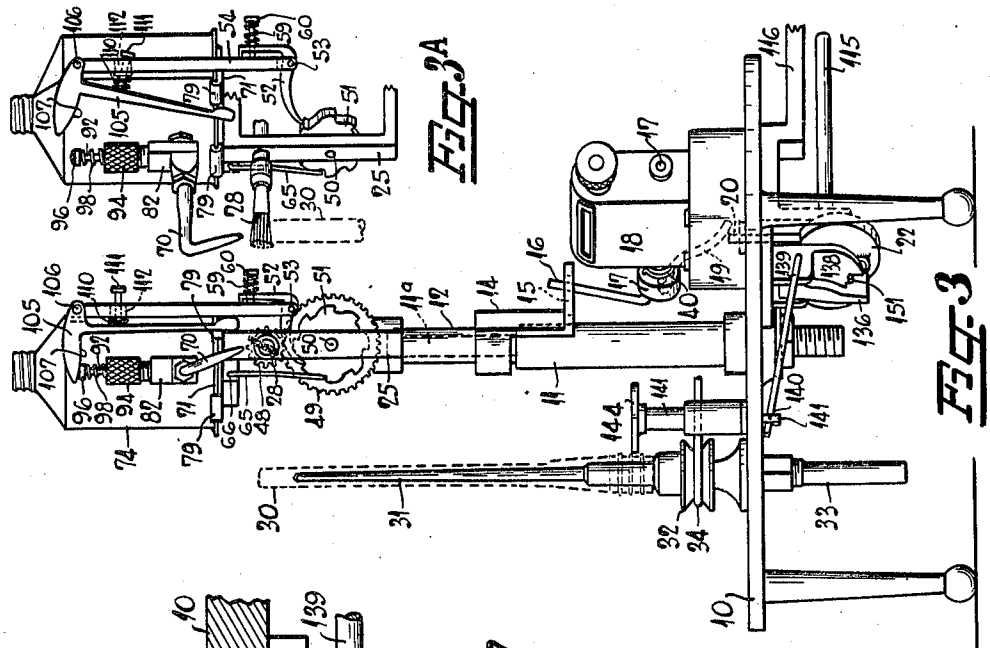


Fig. 3A

Fig. 3

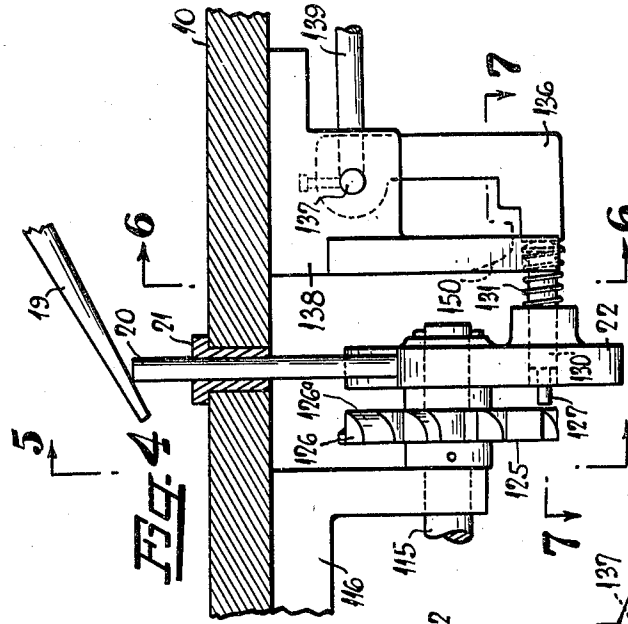


Fig. 4

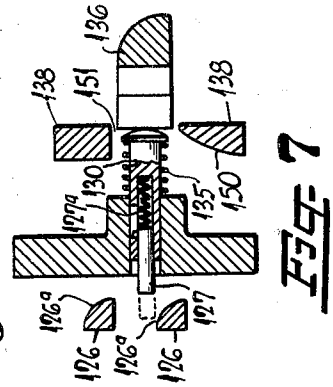


Fig. 7

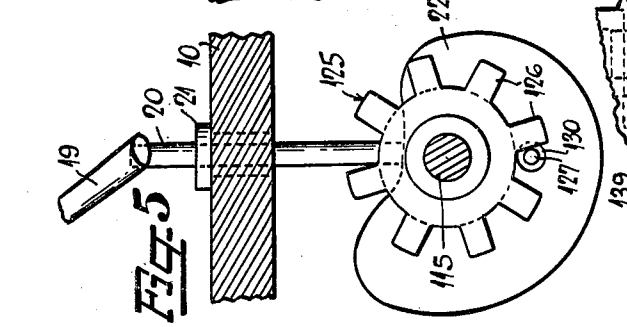


Fig. 5

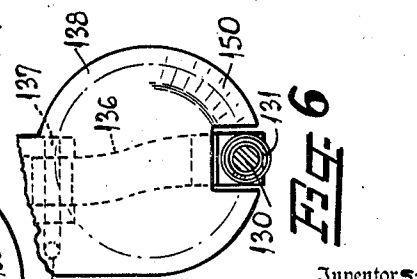


Fig. 6

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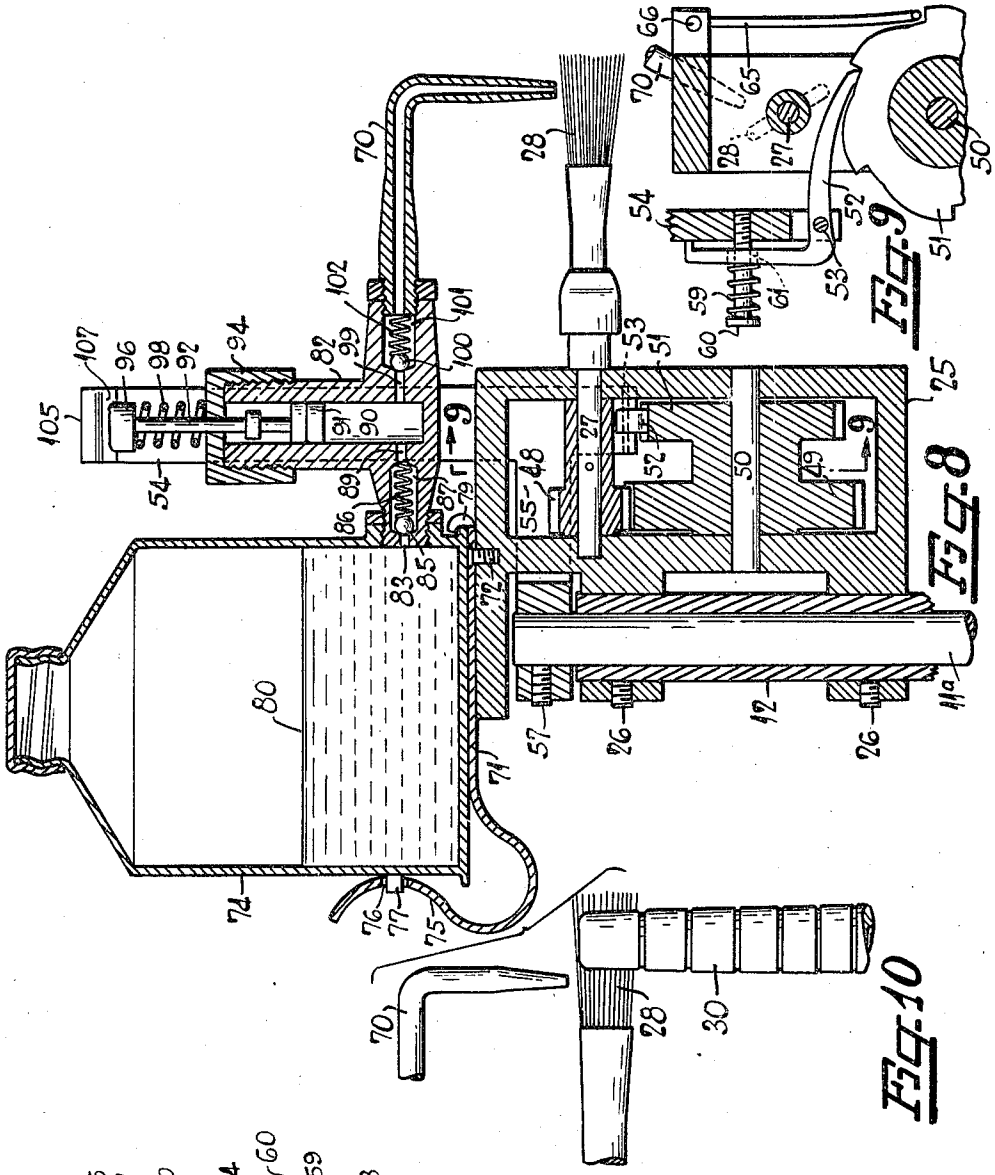


Fig. 8

Fig. 9

Fig. 10

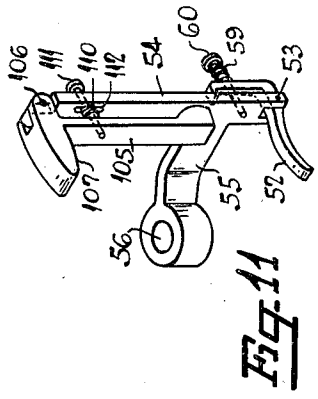


Fig. 11

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2,330,494

COATING APPARATUS FOR YARN HOLDERS

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Application November 24, 1941, Serial No. 420,196

12 Claims. (Cl. 91—39)

This invention relates to a marking apparatus and more especially to a machine for painting identification marks on yarn holders such as bobbins, spools and the like. The present invention forms a continuation in part of my copending patent application Serial Number 354,652, filed August 29, 1940, Patent No. 2,281,358 of April 28, 1942.

It is an object of this invention to provide a yarn carrier painting apparatus in which an improved mechanism is employed for moving a marking brush into contact with a carrier, and also in which an improved means is provided for holding the brush in contact with the carrier for a predetermined length of time.

Specifically, the improved structure, in part, comprises a rotating spindle for supporting a yarn holder, in combination with a cam for positively moving a paint brush toward and away from the holder, and a clutch for connecting and disconnecting the cam with a suitable driving means.

The improved structure insures that each carrier will be engaged by the brush for the same length of time and thereby will receive a coat of marking material substantially the same as the coat applied to each of the preceding carriers.

It is another object of this invention to provide a marking apparatus of the class described in which manually operable means are provided for connecting the brush advancing cam with its driving means, and automatic means for disconnecting said cam from its driving means after a coating of marking material has been applied.

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 an elevation of my improved coating apparatus for yarn carriers and the like;

Figure 2 is a plan view of Figure 1;

Figure 3 is an elevation looking at the right-hand side of Figure 1, showing the coating brush moved away from a yarn carrier to be coated;

Figure 3A is a detail view of the upper portion of Figure 3, showing the parts in a different position, in which the coating brush is shown in contact with the yarn carrier;

Figure 4 is a sectional detail view taken along the line 4—4 in Figure 2, illustrating the clutch mechanism associated with the brush advancing structure;

Figure 5 is a vertical sectional view taken along the line 5—5 in Figure 4;

Figure 6 is a vertical sectional view taken along the line 6—6 in Figure 4;

Figure 7 is a sectional plan view taken along the line 7—7 in Figure 4;

Figure 8 is an enlarged sectional detail view taken along the line 8—8 in Figure 2, illustrating the paint or marking material dispensing mechanism;

Figure 9 is a sectional view taken along the line 9—9 in Figure 8;

Figure 10 is an enlarged detail view showing the upper portion of a yarn carrier while being contacted by a marking means such as a brush, and also showing a portion of the conduit for supplying marking material to the brush;

Figure 11 is an isometric view showing the cam means for pumping predetermined quantities of marking material upon the brush, and also showing means for turning the brush a partial revolution each time a yarn carrier is marked.

Brush support and advancing structure

Referring more specifically to the drawings, the numeral 10 denotes a suitable base member which has extending upwardly from the central portion thereof a suitable shaft 11. This shaft has integral with its upper portion a restricted shaft portion 11*a* around which a sleeve or pipe 12 is rotatably mounted, said sleeve having one end of a lever 14 secured thereto. This lever extends downwardly and then laterally, and has a suitable slot 15 in the outstanding leg thereof, which is penetrated by an upstanding arm 16. The arm 16 extends upwardly from a horizontally disposed shaft 17, said shaft 17 being rotatably mounted in a suitable bearing such as counter casing 18. Shaft 17 has another arm 19 extending laterally therefrom, and the free end of this arm 19 rests upon the upper end of a vertically disposed plunger 20, which plunger is mounted for vertical sliding movement in a suitable collar 21 secured in base member 10, previously described. A suitable cam 22 is provided in such a position that the lower end of the plunger will rest upon the periphery thereof. Therefore, as the cam 22 rotates the sleeve 12 will be oscillated back and forth around portion 11*a* by means of members 14 to 20. The purpose of providing the oscillating sleeve 12 is to have means whereby a suitable paint brush or other marking means 28 can be moved into and out of contact with

a portion of a rotating yarn carrier 30 to thereby cause the yarn carrier to be painted or marked.

With the parts in bold line position as shown in Figure 2, the brush or marking means 28 is removed from contact with the yarn carrier, and therefore is not in position for marking the same; however, when the parts are moved to dotted line position in this same Figure by cam 22, the brush will contact the upper end of the yarn carrier to coat the same.

This brush and associated mechanism is mounted upon a suitable bracket 25, said bracket being secured to sleeve 12 by any suitable means such as screws 26. Rotatably mounted in the bracket 25 is a brush shaft 27 (Figure 8) said brush shaft having secured on the projecting end thereof brush 28. As the brush 28 swings laterally through an arc whose center is shaft 11*a* (Figures 2 and 3) the end of the brush contacts the upper end of yarn carrier 30. The carrier 30 is removably mounted on a suitable spindle 31.

Yarn carrier support and rotating means

The spindle 31 has a whorl 32 integral with the intermediate portion thereof, and the lower portion of spindle 31 is rotatably mounted in a bolster 33 which, in turn, is secured to supporting member 10. As a means for constantly driving the whorl 32, spindle 31 and the yarn carrier 30, a suitable belt 34 is provided which belt 34 is also mounted upon a pulley 35 secured on the end of a motor shaft 36. This motor shaft is driven by a conventional motor 37 mounted on the support 10.

Since the yarn carrier is constantly rotated by the motor 37, a supply of coating material which is on the brush will be applied to the yarn carrier each time the brush 28 is advanced to contacting position. The brush 28, however, is moved into engagement with the tip of the yarn carrier 30 by means of the cam 22 previously described. As a means for normally rotating the brush 28 away from the yarn carrier 30 and for holding plunger 30 in engagement with cam 22 at all times, a suitable torsion spring 40 is provided (Figure 2), one end of said torsion spring being secured to shaft 17 and the other end of the torsion spring being secured to counter housing 18.

This torsion spring normally rotates the shaft 17 and its associated arms 16 and 19 in a counterclockwise manner in Figure 1 to thereby cause the brush 28 to be normally forced away from the observer. It is only when the positive force exerted by the rotation of cam 22 is applied that the force of the spring 40 is overcome and the brush 28 is moved to dotted line contacting position as shown in Figure 2.

Brush rotating means

It is preferable that the brush 28 be intermittently rotated about its axis so that all portions thereof will contact an object to be marked in a continuous operation. If only one side of the brush were to contact the yarn carriers, the bristles would become set in one position and would not apply a uniform coating of paint to the yarn carriers after a short period of use. By providing means for rotating the brush to different positions, all sides of the brush are permitted to contact carriers and therefore a much more satisfactory marking operation is effected. This rotation of the brush 28 is produced by a structure that will be presently described.

By referring to Figure 8, it will be seen that the shaft 27 has fixedly secured therearound, a pinion 48, said pinion meshing with a larger pinion 49, which, in turn, is rotatably mounted upon another shaft 50. This shaft 50 is secured in bracket 25. Integral with the pinion 49 is a ratchet wheel 51, the teeth of which are engaged by a suitable pawl 52.

By referring to Figures 3, 4, 8 and 11 the details of pawl 52 and associated structure can be seen. This pawl is L-shaped and is pivoted intermediate its ends as at 53, to the lower end of a bracket 54, said bracket having a laterally disposed leg 55 in which a vertically disposed bore 56 is provided (Figure 11). This bore fits over the upper end of shaft 11*a* and is rigidly secured thereto by any suitable means such as a set screw 57. In order to normally urge the pawl 52 in a counter-clockwise manner in Figures 3 and 11, at all times, a suitable compression spring 59 is provided, one end of which is firmly pressed against the vertical leg of the pawl by any suitable means such as a headed screw 60. This screw penetrates a suitable slot 61 (Figure 9) in the vertical leg and has the small end thereof threadably mounted in the lower end of bracket member 54.

Especial attention is called to the fact that the parts 52 to 60 inclusive remain substantially in a stationary position except for the limited amount of rotation permitted pawl 52. On the other hand, the bracket 25 together with its associated members 26, 27, 28, 48, 49, 50, and 51 are mounted for rotation as a unit around shaft 11*a*. In other words, the brush 28 moves laterally from the position shown in Figure 3 to the position shown in Figure 3A, during a marking operation. This lateral movement of the brush 28 along with the ratchet wheel 51 is sufficient to cause the free end of the dog 52 to engage an adjacent tooth in the ratchet wheel 51, and therefore when the ratchet wheel returns to the normal position as shown in Figure 3, it will be rotated a distance of one tooth to thereby cause pinions 48 and 49, shaft 27 and brush 28 to rotate a corresponding amount. The teeth of the ratchet wheel 51 are also engaged by a locking dog 65, said dog having its upper end rotatably mounted in bracket 25 as at 66, and having its free end normally engaging one of the notches in the ratchet wheel. Member 65 prevents reverse rotation of the ratchet wheel 51 and its associated parts and thereby insures that the brush 28 will remain in the position to which it has been rotated while the dog 52 is moving reversely over the ratchet teeth.

It will also be noted that by observing Figures 3 and 9 that the bristles of the brush 28 are flattened into a compact mass, the flattened side of which is disposed at an acute angle to a vertical position. By placing the flattened brush 28 at this angle, it is in a better position to receive the contents such as paint and the like from a dispensing pipe 70 thereabove.

Dispensing mechanism for the marking material

It is very desirable that a predetermined quantity of marking material may be applied to the brush 28 each time a yarn holder is painted or marked. Unless such a mechanism is provided, the amount of paint or marking material which is present on the brush 28 will vary from time to time, and of course the amount of material placed on the holders will vary. As a means for providing this dispensing mechanism a suitable plate

71 is secured to the upper portion of bracket 25 by any suitable means such as a screw 72. This plate member 71 forms a base upon which a container 74 is adapted to removably fit. In order to hold the container 74 upon the platform 71 a suitable spring lip 75 is provided, which spring lip forms an integral portion of plate member 71. The lip 75 has a hole 76 in the vertical leg thereof which hole fits over a pin or projection 77 extending from one side of container 74. When the lip 75 is in the position shown in Figure 8, the opposite side of the cam 74 is pressed into hooked portions 79 to thereby hold the container in clamped position. This container is adapted to have suitable marking fluid 80 such as paint or the like therein.

Leading from the bottom of the can 74 is an inverted T-shaped fitting 82, said fitting 82 having a small bore 83 in the left hand end thereof (Figure 8) over which a ball 85 is adapted to fit. This ball 85 is normally pressed over bore 83 by any suitable means such as compression spring 86 disposed in an alined bore 87. Another bore 88 is provided in alinement with bores 83 and 87. This last-named bore 89 communicates with a vertically disposed cylinder 90 in which is slidably mounted a piston 91. Leading from the upper side of piston 91 is a rod 92 which slidably penetrates a cap member 94 which cap covers cylinder 90. On the upper end of rod 92 an enlarged head 96 is provided for confining a spring 98 around rod 92.

It will be noted that the spring 98 normally tends to force piston 91, shaft 92, and head 96 upwardly at all times. Of course, when members 91, 92 and 96 move upwardly, a charge of paint or marking fluid 80 is drawn inwardly through bores 83, 87 and 89 and into cylinder 90.

Leading from the lower portion of the cylinder 90 is another bore 99 over which a ball 100 is adapted to fit, which ball is disposed inside of an enlarged bore 101. This enlarged bore 101 has a compression spring 102 therein for normally pressing the ball 100 over the opening or bore 99. As a means for confining spring 102 within the bore 101, one end of a suitable L-shaped dispensing pipe 70, previously described, is threadably secured in the end of bore 101. Ball 85 serves as a check valve as piston 91 moves downwardly to discharge the contents from cylinder 90; whereas ball 100 serves as a check valve while piston 91 moves upwardly to draw a supply of marking material into the cylinder 90.

When the brush 28, together with container 74, fitting 82, and dispensing pipe 70, is moved from the position shown in Figure 3 to the position shown in Figure 3A, the upper end of head portion 96 is not depressed by any mechanism, and therefore, is moved upwardly the maximum amount by spring 98, where a full charge of marking material will be drawn into cylinder 90. When the parts just named return to normal position as shown in Figure 3, the head portion 96 is automatically depressed to lower the piston 91 and to discharge a predetermined portion of marking material from the cylinder 90 through bores 99 and 101 and through pipe 70 onto brush 28.

This means for engaging and depressing the head portion 96 comprises a suitable T-shaped bar 105, the upper portion of said bar being pivoted as at 106 to the bracket member 54. One of the laterally disposed legs of this bar 105 has a cam surface 107 formed on the lower side thereof which serves as a base against which the head portion 96 slidably contacts when it moves from the position shown in Figure 3A to the position shown in Figure 3.

In order to insure that the lower portion of the lower cam surface 107 will properly engage the head portion 96, a suitable spring 110 is provided. This spring is disposed between the vertical legs of the T-shaped member 105 and the face of bracket 54. A pin or screw 111 has one one thereof threadably secured in the vertical leg of T-shaped bar 105, said pin penetrating a slot 112 in the bracket 54, and supporting the compression spring 110 therearound. This compression normally tends to rotate the T-shaped bar 105 in a clockwise manner to the position shown in Figure 3A, when the brush 28 is in contacting position with holder 30. As the brush returns to normal position as shown in Figure 3 along with the container 74 and fitting 82, the head portion 96 will move beneath the cam surface 107 and the farther it moves to the right in Figure 3, the more the head portion 96, together with cylinder 91 will be depressed. In other words, the piston 91 is depressed by cam surface 107 as a result of the rotation of member 105 when its vertical leg is engaged by the moving bracket 25 during the return of the parts to normal position as shown in Figure 3.

Clutch mechanism

From the foregoing description, it is seen that as cam 22 (Figures 4, 5 and 6) rotates, the brush 28 is moved to painting position. Also as the brush moves from painting position back to normal position, a predetermined amount of marking material is discharged upon the brush for the next succeeding marking operation. It is desirable to provide a suitable clutch mechanism whereby the movement of the cam 22 can be properly controlled to produce the marking and dispensing operations heretofore described. The cam 22 is freely rotatably mounted upon a suitable shaft 115 (Figures 2, 4, and 5), said shaft 115, in turn, being rotatably mounted in a suitable bracket 116, secured to the lower portion of support 10. The shaft 115 has a worm gear 117 secured on the end remote from the cam 22, and meshing with this worm gear is a suitable worm 118 which is fixedly secured upon motor shaft 36.

When the motor 37 is in operation, the spindle 31 and the associated yarn carrier 30 will be constantly rotated. At the same time, the shaft 115 will be rotated but since the cam 22 is loosely mounted therearound, the cam will normally remain stationary. As a means for connecting a shaft 115 to the cam 22, a suitable disk 125 is fixedly secured around the shaft 115. Said disk has a plurality of radially disposed spokes or prongs 126 which are adapted to engage a suitable plunger 127 extending from plunger 130 in the cam 22. Especial attention is called to the fact that each of the spokes 123 has a beveled face 126*a* adjacent the plunger 127 to thereby insure that the plunger 127 will move between the spokes when it is desired to connect the cam 22 to the shaft 115. This cam surface 126*a* is disposed on the back side of the spokes from the side which engages the plunger 127, and serves to permit the plunger to move laterally inward between the spokes instead of being stopped before entering. When the plunger 127 is disposed between two adjacent spokes 126, it forms a tie between member 125 and cam member 22 and

therefore causes the cam 22 to rotate along with shaft 115.

By observing Figure 7, it will be seen that the plunger 127 is slidably mounted in a second plunger 130, said plunger 130 in turn, being slidably mounted in the cam 22. A suitable compression spring 131 normally forces the plunger 127 laterally from the plunger 130 at all times; but when the plunger 127 is in extended position it will not normally project into the path of the spokes 126 unless the plunger 130 has been moved laterally from its normal position as shown in Figure 7. The plungers 127 and 130 are held in normal position, that is in the position where the end of plunger 127 will not contact spokes 126, by any suitable means such as compression spring 135 disposed around the plunger 130.

The plungers 127 and 130 are pushed to the left in Figures 4 and 7 by means of a suitable L-shaped lever 136. This lever 136 has its upper end pivotally mounted as at 137 in a bracket 138, said bracket 138 being secured to the lower portion of support 10. Fixedly secured to lever 136 as at 137 is an L-shaped rod 139, said rod 139 having its free end pivotally secured as at 140 to a lower end of vertically disposed shaft 141. This shaft 141 is slidably mounted in the supporting stand 10 and projects vertically upwardly therethrough. On the upper end of shaft 141 is a button or hand rest 144 upon which downward pressure is applied when it is desired to rotate the lower end of lever 136 to the left in Figure 4 and thereby push the plunger 127 between two adjacent spokes 126, thereby connecting the cam 22 to the driving shaft 115. A compression spring 146 is disposed around rod 141 whereby the hand rest 144 is held in normal uppermost position and whereby the lower end of lever 136 is held in retracted position to permit the plunger 127 to remain out of the path of spokes 126.

When the hand rest 144 is depressed, however, the lower end of lever 136 (Figure 4) will be pushed inwardly to push plungers 127 and 130 farther into the cam 22. If the spoke 126 happens to be disposed in the path of the plunger 127 when such pressure is applied to the hand rest, the spring 127*a* will be depressed while the plunger 130 continues to move inwardly. Since the rotation of the wheel 125 is relatively fast, it is only necessary for pressure to be applied to the hand rest 144 for a very short period of time until the spoke 126 will pass by the engaging plunger 127 sufficiently to permit spring 127*a* to force the same to dotted line position between the spokes.

Upon the engagement of the plunger 127 by one of the spokes 126, the cam 22 together with the plungers 127 and 130 will be bodily rotated about shaft 115. As this plunger 130 rotates a sligiht amount from the position shown in Figures 4, 5 and 7, the head of said plunger will engage a suitable cam surface 150 which surface is cut on the face of bracket 138. In other words, by exerting manual pressure on the hand rest for a very short interval of time, the plunger 130 will be bodily rotated about shaft 115 until the head of the plunger moves into engagement with the cam surface 150, and this cam surface will positively hold the plunger in advanced position for almost a complete revolution of shaft 115.

When a complete revolution of cam 22 has been made, the head of plunger 130 will again slide into a notch 151 cut in the vertical face of bracket 138. The hand pressure will have been relieved from the hand rest during the rotation of the cam and therefore the lower end of the lever 136 will be retracted to normal position by the force of spring 135; consequently plunger 127 will be disposed in a non-obstructing position relative to wheel 125 when the plunger 130 completes this revolution and again enters the notch 151.

It is therefore seen that this improved clutch mechanism makes it possible for a very slight pressure on the hand rest to connect the cam 22 to its driving shaft 115. The hand rest may be almost immediately released because the cam surface 150 will maintain the plungers 127 and 130 in an extended position for the remainder of the revolution. Upon completion of a revolution the plungers will automatically free themselves from spokes 126 by virtue of the spring 135 which forces the head of plunger 130 back to normal position within notch 151 when a revolution has been completed, and thereby disconnect cam 22 from its driving shaft 115.

In the drawings and specification, there has been set forth a preferred embodiment 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 is described in the claims.

We claim:

1. Apparatus for applying a coating to objects such as yarn carriers comprising a rotary holder for the object, a swingable brush adapted to engage an object on said holder, a cam for swinging said brush into engagement with said object, spring means for moving the brush out of engagement with said object, and means for rotating the brush along its longitudinal axis upon each swinging movement.

2. Apparatus for applying a coating to objects such as yarn carriers, comprising a rotary holder for the object, a swingable brush adapted to engage an object on said holder, positive means for swinging said brush into engagement with said object and for holding the same in engaging position for a predetermined time interval, means for swinging the brush out of engagement with said object, and means for rotating the brush along its longitudinal axis upon each swinging movement.

3. Apparatus for applying a coating to objects such as yarn carriers, comprising a rotary holder for the object, a swingable brush adapted to engage an object on said holder, a cam for swinging said brush into engagement with said object, a driving means for said cam, a clutch between said cam and said driving means, means for moving said clutch to engaging position to thereby cause said cam to be driven by said driving means, whereby the brush is moved into engagement with said object, and means for rotating the brush along its longitudinal axis upon each swinging movement.

4. Apparatus for applying coating to objects such as yarn carriers, comprising a rotary holder for the object, a movable brush adapted to engage an object on said holder, a cam for moving said brush into engagement with said object, a driving means for said cam, a clutch between said cam and said driving means, means for moving said clutch to engaging position to thereby cause said cam to be driven by said driving means, whereby the brush is moved into engagement with said object, means for moving said brush out of engagement with said object, and

means for automatically disengaging said clutch after said brush has been moved away from the object.

5. Apparatus for applying a coating to objects such as yarn carriers, comprising a rotary holder for the object, a movable brush adapted to engage an object on said holder, a clutch, positive means controlled by the clutch for moving said brush into engagement with said object and for holding the same in engaging position for a predetermined time interval, means for moving the brush out of engagement with said object, and means for automatically disengaging said clutch after said brush has been moved away from the object.

6. Apparatus for marking yarn holders and the like, comprising means for supporting said holder, a marking element mounted for swinging movement in a plane disposed at right angles to the longitudinal axis of said holder supporting means, cam means for positively moving said marking means against said holder, and means for rotating the brush along its longitudinal axis upon each swinging movement.

7. Apparatus for marking yarn holders and the like, comprising means for supporting said holder, a marking element mounted for swinging movement in a plane disposed at right angles to the longitudinal axis of said holder supporting means, cam means for positively moving said marking means against said holder, spring means for moving the brush out of engagement with said holder, and means for rotating the brush along its longitudinal axis upon each swinging movement.

8. Apparatus for marking yarn holders and the like, comprising means for supporting said holder, a marking element mounted for swinging movement in a plane disposed at right angles to the longitudinal axis of said holder supporting means, a cam for moving said marking means into engagement with said holder, a driving means for said cam, a clutch between said cam and said driving means, means for moving said clutch to engaging position to thereby cause said cam to be driven by said driving means whereby the marking means is moved into engagement with said holder, and means for rotating the brush along its longitudinal axis upon each swinging movement.

9. Apparatus for marking yarn holders and the like, comprising means for supporting said holder, a marking element mounted for swinging movement in a plane disposed at right angles to the longitudinal axis of said holder supporting means, a cam for moving said marking means into engagement with said holder, a driving means for said cam, a clutch between said cam and said driving means, means for moving said clutch to engaging position to thereby cause said cam to be driven by said driving means whereby the marking means is moved into engagement with said holder, and means for automatically disengaging said clutch after said marking means has been moved away from said holder.

10. Apparatus for marking yarn holders and the like comprising means for supporting said holder, a marking element mounted for swinging movement in a plane disposed at right angles to the longitudinal axis of said holder supporting means, a cam for moving said marking means into engagement with said holder, a driving means for said cam, a clutch between said cam and said driving means, manually operated means for moving said clutch to engaging position to thereby cause said cam to be driven by said driving means, whereby the marking means is moved into engagement with said holder, and a second cam for holding said clutch in an engaged position.

11. Apparatus for marking yarn holders and the like comprising means for supporting said holder, a marking element mounted for swinging movement in a plane disposed at right angles to the longitudinal axis of said holder supporting means, a cam for moving said marking means into engagement with said holder, a driving means for said cam, a clutch between said cam and said driving means, manually operated means for moving said clutch to engaging position to thereby cause said cam to be driven by said driving means, whereby the marking means is moved into engagement with said holder, a second cam for holding said clutch in an engaged position, and means for automatically disengaging said clutch after said marking means has been moved away from said holder.

12. Apparatus for marking yarn holders comprising a rotating spindle around which said holder is adapted to removably fit, a brush, means for moving said brush towards said holder, means for moving said brush away from said holder, a marking material dispensing means and a lever operable upon said reverse movement for operating said dispensing means to cause a measured quantity of marking material to be applied to said brush.

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