Sept. 9, 1969 N. R. HENRY ETAL 3,465,979

WEB ROLL CRADLE

Filed Aug. 21, 1967 2 Sheets-Sheet 1

FIG. 1

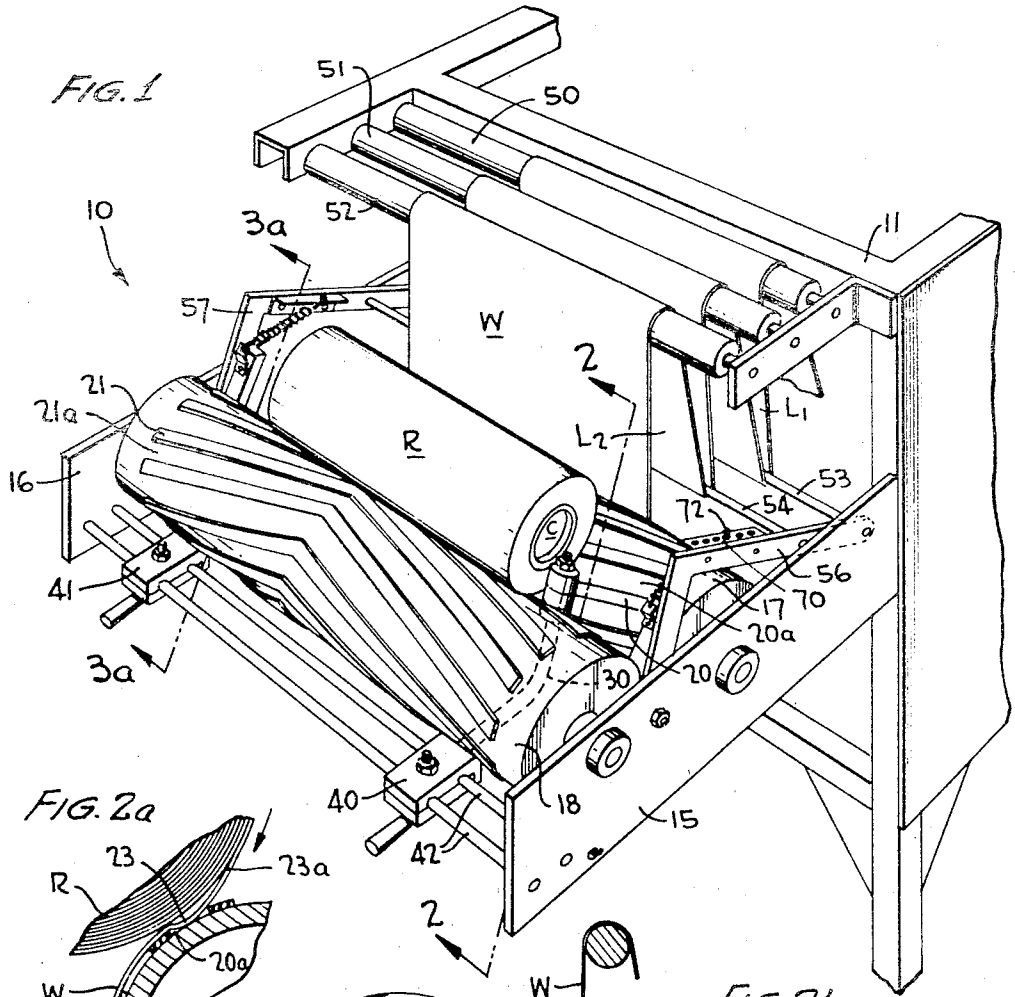

FIG. 2a

FIG. 2

FIG. 2b

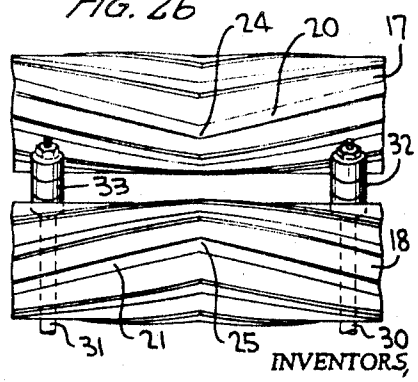

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FIG. 3

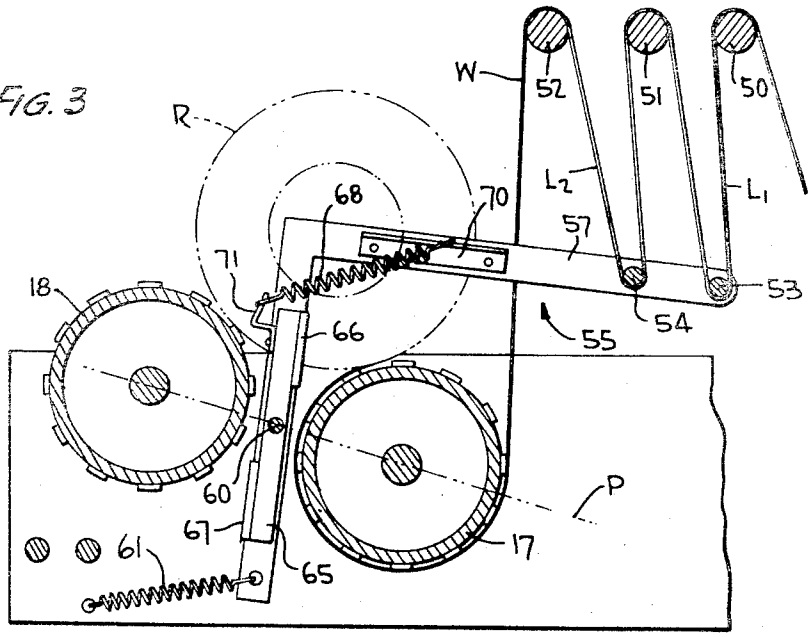
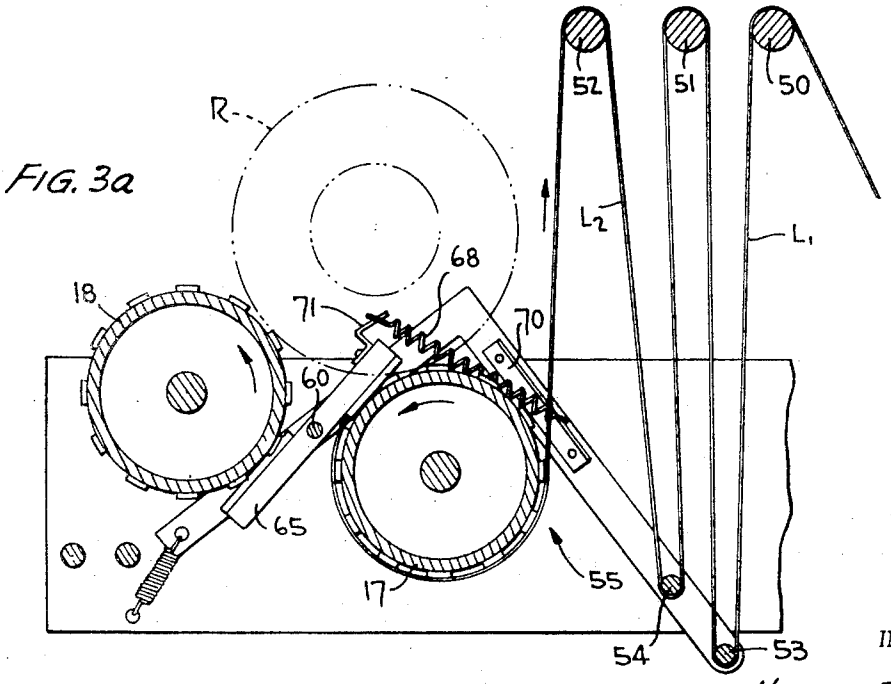


FIG. 3a



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WEB ROLL CRADLE

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U.S. Cl. 242—68.7 17 Claims

ABSTRACT OF THE DISCLOSURE

A roll cradle wherein the rollers are provided with a plurality of longitudinally extending ridges on the surface thereof forming spaced pockets to accommodate a slack loop so as to allow the same to pass from the roll. The forward one of said rollers in the direction of travel of the web is positioned below the rear roller and the web is looped around said forward roller to prevent accidental dislodgement of said roll. The ridges are of a herringbone pattern to insure smooth transitional movement across said pockets and upstanding rods are provided to maintain the roll centered in the cradle. Brake means with dancer lever provides tension control of the web.

The present invention relates to apparatus for unwinding a web roll of flexible sheet material and, more particularly, to a roll cradle for web packaging material which eliminates the need for the use of a central supporting arbor.

In the art of winding and unwinding sheet material of indefinite length, it is known to employ a cradle to support the roll of material on its periphery in lieu of using an arbor extending through the core of the roll. These coil cradles have the advantage of allowing quicker and easier removal and replacement of the coils and thus represent significant savings to the user by reducing the down time of the machine served by the cradle and by allowing an operator to service more machines. Other obvious advantages which come to mind are that the cradle can operate successfully on coils of different sizes and that the diameter of the hollow core of the coil is not critical, as in the case where an arbor is employed to support the coil. Further, with the elimination of the arbor there is no need to maintain the extra arbors to fit different coils thereby representing a savings in cost of equipment, as well as freeing valuable space around the machine and preventing accidents that might result from a spare arbor inadvertently being left on the floor.

Thus, while the use of cradles for supporting a roll of material is desirable, such cradles have found favorable acceptance in use only with certain products, such as coils of strip metal and certain other relatively stiff sheet material. That is, unexpected problems have arisen in adapting their use to more flexible material, such as polyethylene, cellophane, glassine laminates or the like used, for example, in modern form and fill packaging machines. One apparent reason for this is that these materials are more elastic or stretchable, and therefore susceptible to being wound under rather wide variations in tension. To explain, when a web roll of flexible, stretchable material is manufactured and wound into roll form, because of its elasticity and the difference and inherent variation in the tension control of different winding machines, some or all of the roll will be found to be undesirably loosely wound so as to result in the web forming a slack loop during the unwinding operation, usually in the outer turns of the web on the web roll. Due to another characteristic of this type of material, that is the tendency to stick to itself during the unwinding operation until the web is positively separated from the roll, the loop thus formed will eventually stick sufficiently at its trailing end and be

carried intact between the pressure nip formed by the support roller and the web roll thereby forming an undersirable crease or double fold transversely across the web.

Accordingly, it is one object of the present invention to provide a web roll cradle for flexible material, such as used in packaging, which corrects the foregoing problems.

It is another object of the present invention to provide a web roll cradle of the type described wherein the web roll is maintained centered upon the support rollers and the tension or slackness in the web is maintained substantially constant.

To briefly describe the apparatus of the present invention, the web roll is supported on a pair of elongated support rollers having parallel and horizontally disposed axes. On the peripheral surface of at least the forward roller where the web is withdrawn, there is provided a plurality of ridges which form spaced elongated pockets in the operative surface of the roll to accommodate any slack loop in the web as it appears due to the loose winding, as mentioned above.

In accordance with another feature of the invention, centering of the film roll is insured by a pair of upstanding alignment rods which extend through the space between the rollers and act on the opposite end faces of the roll.

The forward roller is positioned lower than the rear roller so that the cradle is in effect tilted forward whereby the roll in use is not likely to be accidentally dislodged toward the operator who loads the cradle from the rear. To compensate for the unbalance in the forward direction due to this tilt, the web is unwound from the roll by looping the same around the forward roller. Thus, the force due to the tension in the web tending to bodily move the roll maintains the same in operative engagement with the rear roll and thereby prevents the roll from riding up on the forward roller and prevents accidental displacement or removal in this direction. To supplement this action and to prevent an excess buildup of slack and runaway of the roll, the apparatus is provided with a dancer-operated brake system which is connected so as to retard the movement of the rolls upon detection of excessive slack in the free portion of the web which has already been unwound.

Still other objects and advantages of the present invention will become readily apparent to those skilled in this art from the following detailed description, wherein we have shown and described only the preferred embodiment of the invention, simply by way of illustration of the best mode contemplated by us of carrying out our invention. As will be realized, the invention is capable of other and different embodiments and its several details are capable of modification in various obvious respects, all without departing from the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not as restrictive.

In the drawings:

FIGURE 1 is an overall perspective view of a roll cradle constructed in accordance with the principles and teachings of the present invention;

FIGURE 2 is a cross-sectional view taken along line 2—2 of FIGURE 1 illustrating the path of travel of said web;

FIGURE 2*a* is a partial cross-sectional view showing the slack loop accommodating action of the pocket between the ridges on the support roller;

FIGURE 2*b* is a cutaway top view of the rollers showing the herringbone pattern of the ridges;

FIGURE 3 is a cross-sectional view like that of FIGURE 2 showing the position of the brake means in the released or no-slack condition; and

FIGURE 3*a* is a cross-sectional view showing the position of the brake means in the applied or slack condition.

With specific reference now to FIGURE 1 of the drawings, a more detailed description of the apparatus of the present invention will be given. In this figure, a roll cradle **10**, employing the principles of the present invention to support a web roll R, is attached to a frame **11** of a processing machine designed to utilize the web W. This machine could be a form and fill packaging machine wherein the web W is formed into a continuous tube and individual bags formed and filled with batches of material, such as food products. However, it should be realized that the particular roll cradle **10** could of course be used in other machines wherein a web roll supply is needed, without departing from the principles of the present invention.

The roll cradle **10** includes a pair of cantilever side frames **15, 16** which serve to carry support rollers **17, 18** in suitable bearings. As shown in the drawings, the rollers are suitably spaced apart to allow them to rotate in the same rotative direction so that their adjacent cradle forming surfaces can move linearly in the same direction, as required. The axes of the support rollers **17, 18** are parallel and extend horizontally so that the roll R of web material may be placed within the space between the rollers for support by gravity on its periphery. The rollers **17, 18** are of course close enough together to prevent core C of the roll R from falling through or wedging between said rollers **17, 18** when the web W has been completely unwound.

The path of travel of the web W from the roll R out of the cradle **10** can best be seen in FIGURE 2 by following the arrows. In the embodiment shown, it is to be understood that the web W is placed under tension and thus unwound from the roll R by a feeding means within the processing machine (not shown). Thus, the support rollers **17, 18** are rotated within their bearings in the direction shown by the arrows by the frictional engagement with said roll R. As well illustrated in this figure, the web W is trained or looped around the roller **17** through an angle of approximately 270°, and is actually separated from the roll R at the pressure nip formed between said roller **17** and the roll R, which arrangement along with its advantages will be described in detail later. Thus, since the roller **17** is forward of the roller **18** in terms of web movement, as well as positioning within the cradle **10**, they can hereinafter for further identification be referred to as forward support roller **17** and the rear support roller **18**.

Suitably affixed, such as by gluing, to the outer periphery of these rollers **17, 18** are a plurality of generally longitudinally extending strips that serve to form a plurality of ridges **20, 21** on the smooth surface of the roll, as can be seen in FIGURES 1 and 2. These ridges **20, 21** extend at an angle with respect to the axes of the respective support rollers **17, 18** for the purpose of insuring that the roll R is in engagement with two or more of said ridges **20, 21** on each of the rollers **17, 18** at all times. As will be realized, this arrangement allows the roll R to rotate within the cradle **10** with a smooth transitional movement or without a bumping or jarring motion of the same over longitudinally extending pockets **20***a*, **21***a* formed between adjacent ones of the respective ridges **20, 21**. A helix angle of approximately 15° has been found to be particularly adapted to meet the requirement of preventing bumping of the roll R while at the same time forming the pockets **20***a*, **21***a* with sufficient longitudinal extent to meet the slack accommodation function of the pockets **20***a*, **21***a* now to be described.

First, to consider the specific interaction of the rollers **17, 18** with the roll R during operation, there is formed a pressure nip **22** at the point of engagement between the roll R and the forward support roller **17**, as illustrated best in FIGURE 2. As stated above, the web W is placed under considerable tension as it is withdrawn from the roll R into the processing machine **11**, and is thus stretched to its fullest extent after it has been separated from the roll R at said pressure nip **22**. However, the pressure nip **22** does, in effect, isolate this stretching action from the final turn of the web on the roll R, so that if the web has been loosely wound on the roll R, slackness will begin to appear along this final turn in the form of a slack loop **23**, as shown in FIGURE 2*a*. The leading edge of the slack loop **23** is usually formed by the pressure nip **22**; whereas, the trailing edge of said loop **23** is usually formed by the inherent property of the packaging material to stick to the roll R, said trailing edge being indicated at **23***a* in FIGURE 2*a*. Thus, as the forward roller **17** continues to turn, the loop **23** is formed, automatically positioned within the next successive pocket **20***a* between successive ridges **20** and allowed to pass from the roll R and onto the periphery of the forward roller **17** where it may be dissipated without harm. Accordingly, with the invention any slackness which has been included on the roll R is translated into the slack loop **23** on the final turn of the roll and is automatically passed through the pressure nip **22** without the formation of any transverse creases in the web, as has heretofore been a problem.

To most efficiently perform this slack accommodating function, the ridges **20, 21** are formed of approximately quarter-inch thick neoprene rubber stock strips, three-quarters of an inch wide and spaced one to one and a half inches apart. The trailing edge of the forward operative ridge **20** forms the leading edge of the loop **23**; whereas, the leading edge of the rear operative ridge **20** forms or aids in forming the trailing edge **23***a* of said loop **23**, as shown in FIGURE 2*a*. In this respect, the formation of the ridges **20, 21** of rubber or other resilient material is of particular advantage to prevent slippage of the slack loop **23** from the pockets **20***a*, **21***a* prematurely. The selection of the width of the pockets **20***a*, **21***a* to be greater than the width of the ridges or about one and one-half times as wide has been found to be sufficient to allow all slackness in the roll due to loose winding to be released. If on any single unit of radial movement, a slack loop **23** larger than can be accommodated in the pockets **20***a*, **21***a* is formed, a portion is simply transferred rearwardly under urging of the next successive ridge **20, 21** and is harmlessly released during the next unit of movement.

The angled ridges **20, 21** are preferably formed in a symmetrical herringbone pattern as clearly shown in FIGURES 1 and 2*b* of the drawings. Such a pattern of the angled ridges **20, 21** has been found to be desirable in that the inherent side thrusts transmitted to the roll R by said ridges **20, 21** cancel each other. In other words, as shown in FIGURE 2*b*, bight **24** of the ridges **20** is positioned in the center of the roller **17** so that when the web roll R is placed in the center of the cradle, the forces tending to shift the web roll R to one side or the other by this roller alone are equal and thus the centering is not disturbed. Also of importance, is that the bight **24** is directed forward in the direction of movement of the web W so that each successive loop **23** is given a leading bow to effect a continuous, outward stretching and beneficial smoothing of the web W from the middle thereof to remove any small imperfections in the web W as it leaves the roll R.

On the other hand, as can also be seen in FIGURE 2*b*, the bight **25** of the roller **18** extends in the opposite direction or rearwardly with respect to the movement of the web, whereby to tend to offset any uneven axial force on said roll R caused by the ridges **20** on the forward roller **17** should said roll R for some reason be positioned in the off-center position. To explain further, the side thrust forces created by the ridges **20** on the roller **17** to the right or left of the bight **24** have opposite counterparts created by the ridges **21** on the roller **18** to the right or left of the bight **25**, respectively, as viewed in FIGURE 2*b*. Thus, the ridges **20, 21** perform their function without adversely affecting to any substantial degree the centering of the roll R within the cradle **10**, as desired.

As illustrated in FIGURE 2 and in accordance with another aspect of the present invention, the forward roller **17** is positioned below the rear roller **18** so that a support plane P of the cradle **10** passing through the axes of said rollers **17, 18** is tilted forwardly so as to intersect the horizontal at an acute angle θ of approximately 15°. This arrangement of tilting of the plane P forwardly or away from the rear of the cradle **10**, has proven to greatly lessen the possibility of the roll R being accidentally dislodged or allowed to fall backwardly over the rear support roller **18**, thus insuring the safety of the opeartor as he loads the cradle **10** from a position behind said rear roller **18**. Due to the web W being trained around the forward roller **17**, the tension force in said web tends to bodily move the roll R is directed in the opposite direction or so as to urge said roll R against the roller **18** so as to counteract the forward tilt and prevent the roll R from being accidentally dislodged forwardly over the roller **17**.

Of further importance relating to the positioning of the roller **17** below the roller **18** is the fact that a greater proportion of the weight of the roll R is on the roller **17** so that said roll R acts with greater force at the pressure nip **22**. This increased pressure encourages formation and isolation of the slack loop **23** in the manner described above, and increases the bite of the edges of the ridges **20** to effectively transversely smooth out the web W due to the leading herringbone pattern as it leaves the roll R.

In accordance with another feature of the present invention, there are provided alignment rods **30, 31** (FIGURES 2, 2*b*) positioned at opposite ends of the roll R so as to act on the end face of said roll R to positively insure maintenance of said roll R in the center of the cradle **10**. The upper or operative ends of the rods **30, 31** extend perpendicular to the plane P (FIGURE 2) so as to act along the radius of the roll R in the manner illustrated. Preferably, the operative ends of the bars **30, 31** are provided with respective guide rollers **32, 33** mounted by any suitable means such as lower flange **34** and upper fastening nut **35**. To insure against possible damage to the edge of the web W or the end face of the roll R, each of the rollers **32, 33** is divided into a number of independently rotatable sections, such as three, as illustrated in FIGURE 2; it being understood that the sections of the rollers **32, 33** engage and rotate with different radial portions of the end face, which are moving at different linear speeds, thus minimizing slippage and insuring against damage to the end faces of the roll R.

As best shown in FIGURE 2, the rods **30, 31** curve under the rear roller **18** for support on adjustable slides **40, 41** (note FIGURE 1) which are carried on a double bar guideway **42**. Each of the slides **40, 41** is clamped in a selected position along the guideway **42** by means of clamp plates **43**, which are operated by a locking screw **44** having a handle **45** in combination with a nut **46**, as best shown in FIGURE 2. As can be seen in FIGURE 1, with this arrangement the slides **40, 41** are positioned for easy access and the cradle **10** may be easily reloaded with a new roll R and indeed may be used with any width roll R by a simple loosening opeartion of the clamp plates **43**, repositioning of the slides **40, 41** and subsequently tightening of said plates **43** in the new position.

The rotation of the rollers **17, 18** is preferably retarded so as to maintain the proper tension in the web W to prevent excess slack and runaway of the roll R. This is accomplished by a novel brake and control means shown compositely in FIGURES 1, 3 and 3*a*. As can be seen from these figures, the web W is looped over stationary reversing rollers **50, 51, 52** so as to provide a pair of depending control loops L_1, L_2. These loops are formed at the bottom by cross bars **53, 54**, respectively, of a dancer lever, generally designated by the reference numeral **55**. The dancer lever **55** comprises a pair of spaced L-shaped members **56, 57** connected by said cross bars **53, 54**; the members **56, 57** being pivotally mounted midway along their vertical leg on the adjacent side frames **15, 16** by stub shafts **60**.

The lever **55** is urged about the stub shafts **60** by combined force of a tension spring **61** and gravity so as to maintain the web W under tension at all times through the action of the bars **53, 54** in the control loops L_1, L_2. Also mounted on each of the stub shafts **60** for independent pivotal movement is a brake block **65** having friction pads **66, 67** at opposite ends thereof and facing the respective rollers **17, 18**. When the tension in the web W slackens and the control loops L_1, L_2 are thereby enlarged, it will be realized that the dancer lever **55** will be lowered or, more specifically, rotated in the clockwise direction as indicated in FIGURE 3*a*, with the slack being taken up in the control loops L_1, L_2. This brings the blocks **65** into frictional engagement with the rotating rollers **17, 18** thereby retarding the same and increasing the tension in the web W, thus resulting in the control loops L_1, L_2 being returned to their normal size of FIGURE 3 and the tension in the web W returned to normal. Preferably, the connection between the dancer lever **55** and the block **65** is by means of a spring **68** so as to provide a resilient engagement and thus nonbinding action of the brake pads **66, 67** against the face of the roller. As can be seen in these figures, the spring **68** is suitably attached to the dancer lever **55** and the block **65** by respective brackets **70, 71**; the bracket **70** having a plurality of holes **72** for receipt of the end of the spring **68** to allow adjustment of the resilient engagement for more or less braking effect, as desired.

Having thus described the invention in detail, it will now be realized that a roll cradle **10** has been provided which is capable of efficiently operating on rolls of flexible and somewhat stretchable packaging material without slack being formed in the final turn of the roll to thereby prevent the formation of harmful creases and wrinkles in the web. With the feature of providing the forward roller **17** below the rear roller **18**, the roll cradle **10** is provided with a safety feature, and in cooperation with this feature, the web W is advantageously trained around the forward roller **17** to insure that the roll R is maintained in snug engagement with the rear roller **18**. Furthermore, the efficiency of opeartion of the roll cradle **10** is greatly enhanced by provision of novel upstanding centering rods **30, 31** for maintaining the roll in the proper transverse position and dancer lever controlled brake means to maintain a relatively constant tension in the web W over a varying range of demand.

In this disclosure, there is shown and descirbed only the preferred embodiment of the invention, but, as aforementioned it is to be understood that the invention is capable of various changes or modifications within the scope of the inventive concept as expressed by the accompanying claims.

We claim:

1. An arborless roll cradle for supporting a web roll during intermittent unwinding operation comprising a pair of elongated support rollers having parallel and horizontally disposed axes, said rollers being spaced to allow said roll to rest between the same so that the center of said roll is above a plane passing through said axes, a plurality of ridges extending generally longitudinally along both of said rollers forming spaced elongated pockets having sufficient width to accommodate a slack loop formed in the final turn of said web and thereby allow the same to pass from said roll without formation of a crease between said surfaces and said roll, said ridges being at an angle to the axis of the respective rollers so that at least two adjacent ones of each of said rollers are in engagement with said roll at all times for smooth transitional movement of said roll over said pockets, said web being trained around and under the for-

ward roller and passing between said rollers for withdrawal whereby said slack loop is formed at the pressure nip between said forward roller and said roll to allow immediate dispersal of said loop upon leaving said roll.

2. The combination of claim 1 wherein each of said rollers has a smooth, outer peripheral surface and said ridges are provided by strips of resilient material fixed to said smooth surfaces so as to extend above the same, whereby to aid in formation and restriction of said loop to be passed by said pockets.

3. The combination of claim 2 wherein said ridges are V-shaped, the bight of said ridges being positioned in the center of said rollers, said bight of said ridges on the forward one of said rollers in the direction of travel of said web extending in said direction of travel so that said ridges produce outward and opposite axail forces on said web whereby said web is given a leading bow and stretched outwardly from the center.

4. The combination of claim 3 wherein the bight of said ridges on the rear one of said rollers extends in the direction opposite to the direction of travel of said web so as to offset any uneven axial force on said roll caused by said ridges on said forward roller.

5. The combination of claim 1 wherein said ridges are resilient to aid in formation and restriction of said loop to be passed by said pockets.

6. The combination of claim 5 wherein is further provided brake means for said rollers, and control means for actuation of said brake means in response to slackness in said web to retard said rollers and prevent an excess buildup of said slackness.

7. The combination of claim 6 wherein said control means includes a pivotal dancer lever forming at least one control loop in said web, said brake means including a pivotal block connected to said dancer lever for frictionally engaging said rollers in response to enlargement of said control loops.

8. The combination of claim 1 wherein the forward one of the support rollers in the direction of travel of said web is positioned below the rear one of said rollers whereby said forward roller receives the majority of the weight of said roll to encourage trapping and formation of said slack loop and so as to prevent accidental removal of said roll over said rear roller.

9. An arborless roll cradle for supporting a web roll during intermittent unwinding operation comprising a pair of elongated smooth surfaced support rollers having parallel and horizontally disposed axes, said rollers being spaced to allow said roll to rest between the same so that the center of said roll is above a plane passing through said axes, and a plurality of ridges extending generally longitudinally along and above the smooth surface of the forward one of said rollers in the direction of travel of said web, said ridges forming spaced elongated pockets having sufficient width to accommodate a slack loop formed in the final turn of said web and thereby allow the same to pass from said roll without formation of a crease between said surface and said roll, said web being looped around said forward roller and passing between said rollers so as to form said slack loop by the pressure nip between said forward roller and said roll immediately prior to separation of said web from said roll.

10. The combination of claim 9 wherein said pockets are approximately one and one-half times as wide as said ridges whereby said accommodated slack loop can be sufficiently wide to prevent excess buildup of slackness.

11. An arborless roll cradle for supporting a web roll during intermittent unwinding operation comprising a pair of elongated support rollers having parallel and horizontally disposed axes, said rollers being spaced to allow said roll to rest between the same so that the center of said roll is above a plane passing through said axes, and a plurality of ridges extending generally longitudinally along the forward one of said rollers in the direction of travel of said web, said ridges forming spaced elongated pockets having sufficient width to accommodate a slack loop formed in the final turn of said web and thereby allow the same to pass from said roll without formation of a crease between said surfaces and said roll, said ridges being at an angle to the axis of the respective rollers so that at least two adjacent ones on each of said rollers are in engagement with said roll at all times for smooth transitional movement of said roll over said pockets, said web being looped around said forward roller and passing between said rollers so as to form said slack loop by the pressure nip between said forward roller and said roll immediately prior to separation of said web from said roll.

12. The combination of claim 11 wherein the forward one of the support rollers in the direction of travel of said web is positioned below the rear one of said rollers whereby said forward roller receives the majority of the weight of said roll to encourage trapping and formation of said slack loop and so as to prevent accidental removal of said roll over said rear roller.

13. The combination of claim 11 wherein said ridges are V-shaped, the bight of said ridges being positioned in the center of said roller, said bight of said forward one of said rollers in the direction of travel of said web extending in said direction of travel so that said ridges produce outward and opposite axial forces on said web whereby said web is given a leading bow and stretched outwardly from the center.

14. An arborless roll cradle for supporting a web roll during intermittent unwinding operation comprising a pair of elongated support rollers having parallel and horizontally disposed axes, said rollers being spaced to allow said roll to rest on the peripheral surfaces of said rollers so that the center of said roll is above a plane passing through said axes, the forward one of the support rollers in the direction of travel of said web being positioned below the rear one of said rollers whereby said plane is tilted forward at an acute angle to prevent accidental removal of said roll over said rear roller, said web being first directed rearwardly toward said rear roller and then trained around said forward roller and between said rollers so as to reverse its direction of travel as it moves forwardly whereby the tension force in said web tending to bodily move said roll is toward said rear roller to prevent accidental removal of said roll over said forward roller, brake means for said rollers, and control means for actuation of said brake means in response to slackness in said web to retard said roller and prevent said roll from climbing up on said forward roller to thus further insure against accidental removal of said roll over said forward roller.

15. The combination of claim 14 wherein said brake means includes a pivotal block symmetrically mounted between said rollers about a pivotal axis lying in said plane, friction pads mounted on opposite sides of said block at the ends thereof to frictionally engage the surface of the roller adjacent the respective end, and wherein said control means comprises a dancer lever forming at least one control loop in said web and mounted for pivotal movement about said pivot axis and spring means to resiliently urge said friction pads toward the respective rollers upon enlargement of said control loops.

16. An arborless roll cradle for supporting a web roll during unwinding operation comprising a pair of elongated support rollers having parallel and horizontally disposed axes, said rollers being spaced to allow said roll to rest on the peripheral surfaces of said rollers so that the center of said roll is above a plane passing through said axes, a pair of upstanding alignment rods extending through the space between said rollers perpendicular to said plane and means on the end of said rods to engage the respective end faces of said roll to insure that said roll is maintained centered on said support rollers.

17. The combination of claim 16 wherein said engaging means includes a plurality of guide rollers mounted for rotation about the longitudinal axis of each rod, each of

said guide rollers being mounted for independent rotation in accordance with the radial portion of the roll engaged.

References Cited

UNITED STATES PATENTS

370,321	9/1887	Cox	242—75.43
425,011	4/1890	Talbert	242—68.7
595,669	12/1897	Chadwick.	
667,893	2/1901	Savery	242—66
817,026	4/1906	White	242—66
1,792,690	2/1931	Hamer et al.	242—76
2,012,118	8/1935	Cameron	242—66
2,850,853	9/1958	Simendinger.	
3,164,332	1/1965	Walker et al.	242—66

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U.S. Cl. X.R.

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