Oct. 22, 1963 S. T. CARTER 3,108,033

APPARATUS FOR APPLYING WRAP-AROUND BODY LABELS TO ARTICLES

Filed May 31, 1961 4 Sheets-Sheet 1

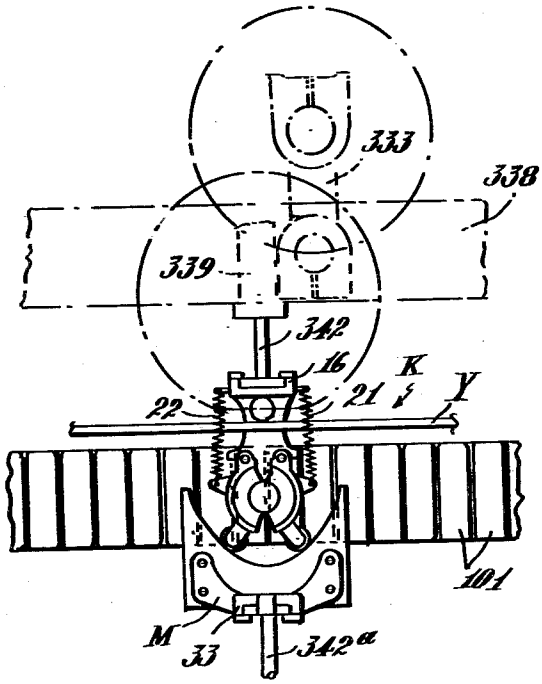


Fig. 1

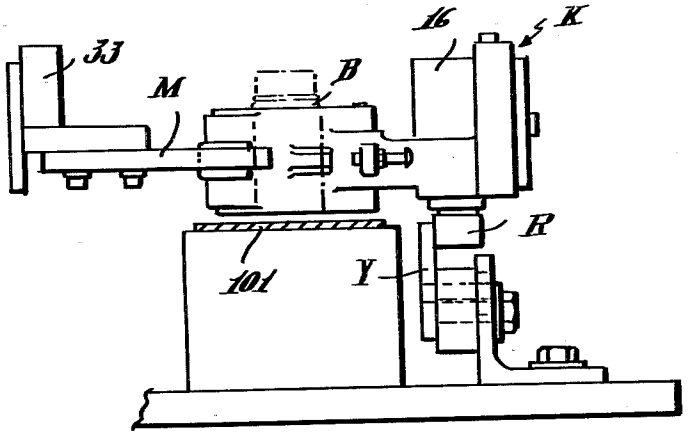


Fig. 2

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Filed May 31, 1961 4 Sheets-Sheet 2

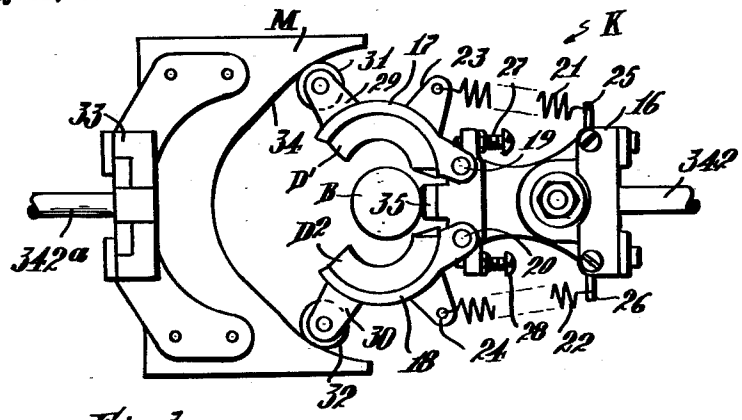


Fig. 3

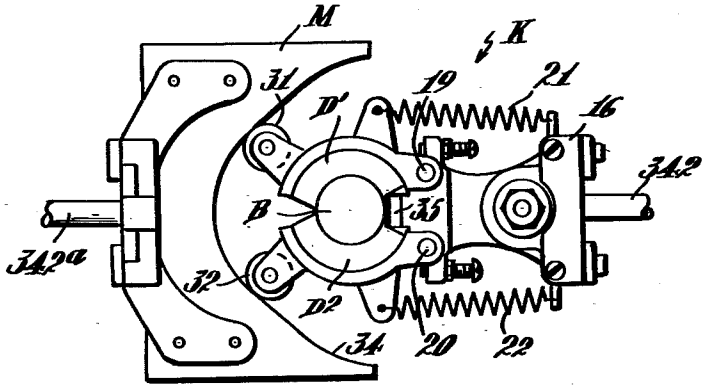


Fig. 4

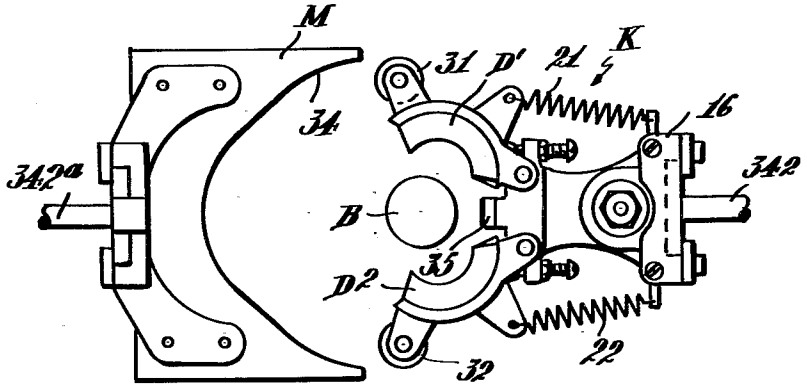


Fig. 5

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Oct. 22, 1963 S. T. CARTER 3,108,033

APPARATUS FOR APPLYING WRAP-AROUND BODY LABELS TO ARTICLES

Filed May 31, 1961 4 Sheets-Sheet 3

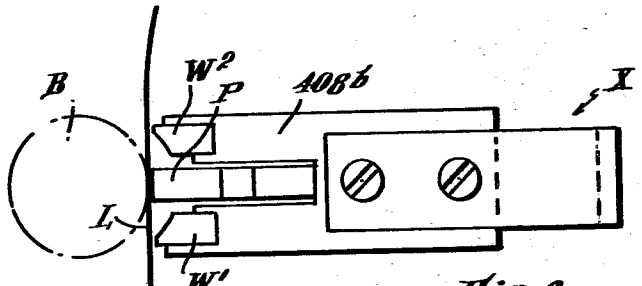


Fig. 8

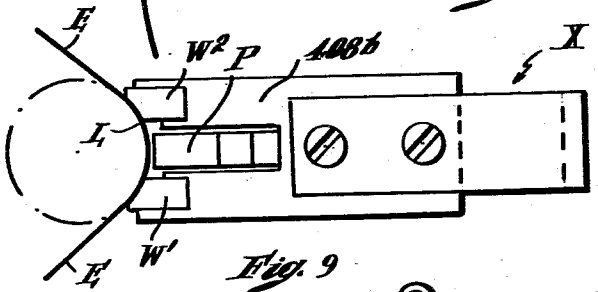


Fig. 9

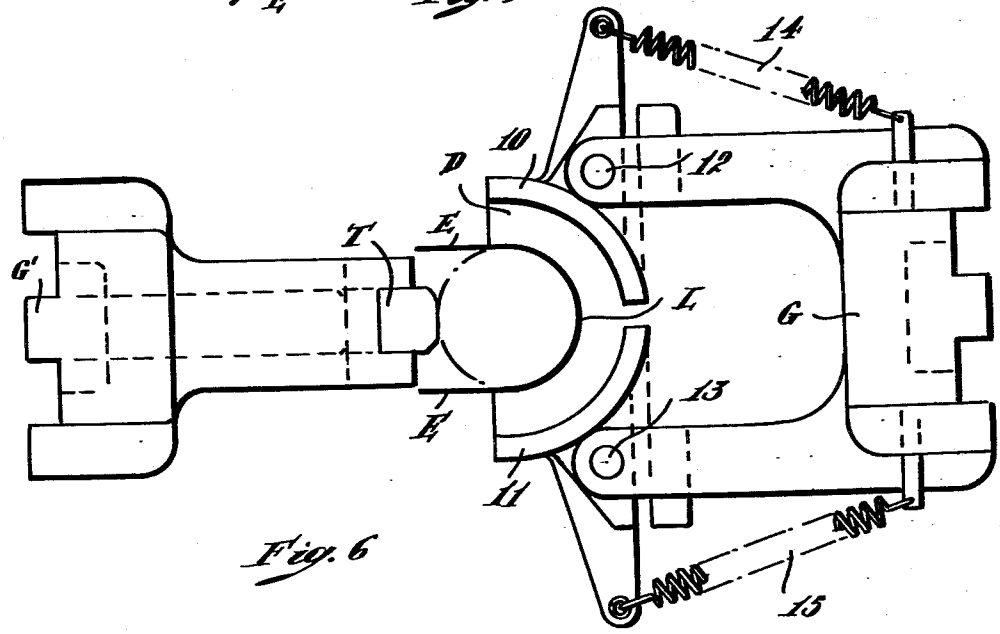


Fig. 6

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APPARATUS FOR APPLYING WRAP-AROUND BODY LABELS TO ARTICLES

Filed May 31, 1961 4 Sheets-Sheet 4

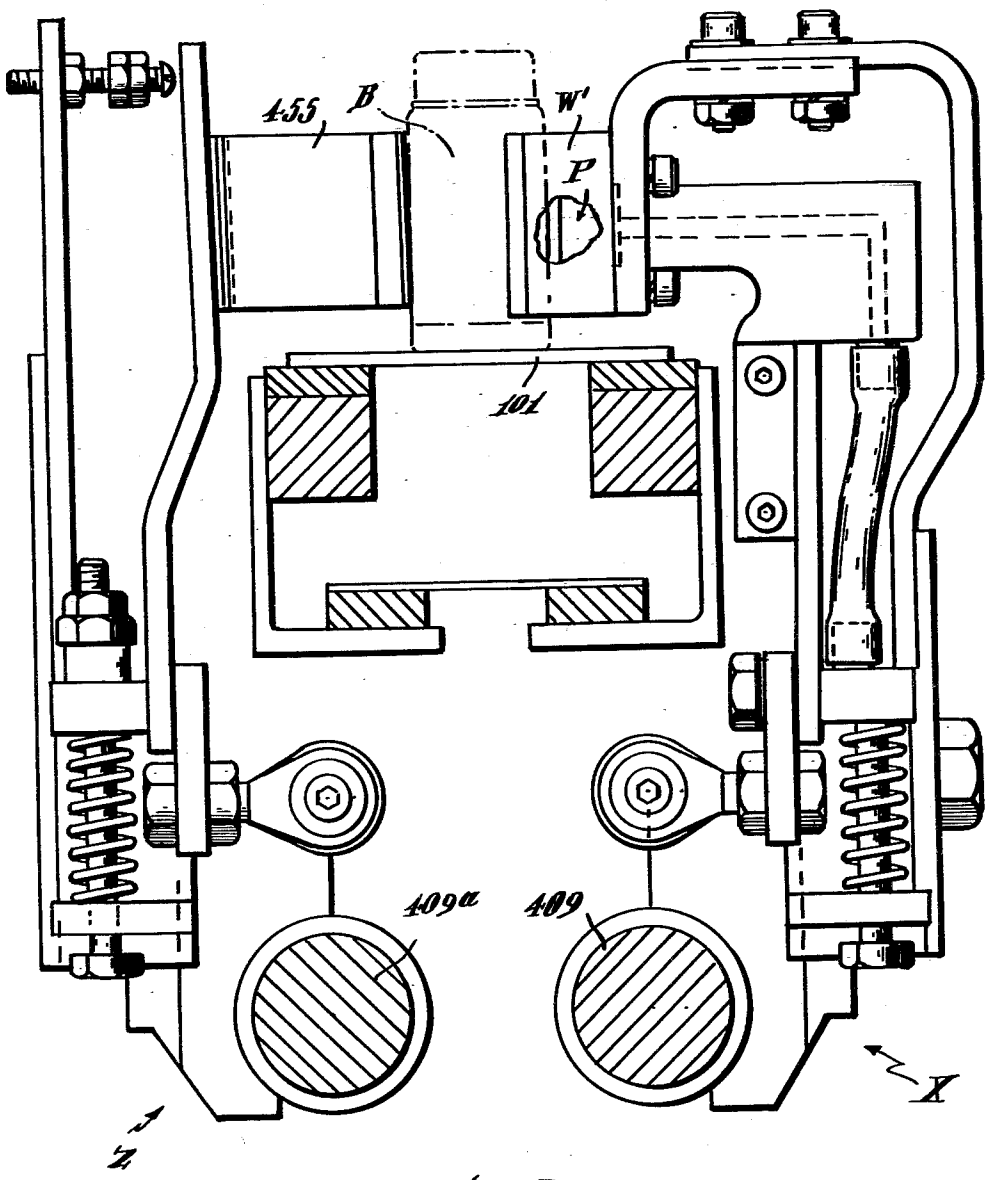


Fig. 7

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United States Patent Office 3,108,033 Patented Oct. 22, 1963

3,108,033
APPARATUS FOR APPLYING WRAP-AROUND BODY LABELS TO ARTICLES

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Filed May 31, 1961, Ser. No. 113,677
9 Claims. (Cl. 156—492)

This invention pertains to labeling machines, and more especially to apparatus designed to apply wrap-around body labels to small bottles, for example to round bottles of the order of one and one-eighth inches in diameter, and so that the label extends around the bottle through an arc as great as 295°.

Most labeling machines, capable of applying front and back labels to a round, flat, or odd-shaped bottle, can usually apply a single label which does not extend about the bottle more than 180°, but when it is desired to apply a label which extends more than 180° about a round bottle, the customary pressure-type wipers are not capable of wiping down the ends of the label. While recourse has been had to the use of rotary brush-type wipers, for wiping down the ends of a label, more particularly, a neck label, the pressure applied by brush bristles is not always sufficient to insure firm adhesion of the ends of a label of substantial width, with the result that the ends of the label become unstuck, thus destroying the intended neat appearance, and possibly resulting in a teearing or other defacement of the label. Moreover, the brush-type wiper, as most commonly employed, is specifically designed for use in a machine in which the label is arranged to be contacted by the advancing face of the bottle as the latter travels along the conveyor path.

The present invention has for its particular object the provision of an attachment, applicable to existing labeling machines of that type wherein, as the article to be labeled is advanced along a conveyor path, the central part of the label is first contacted with the side face of the article by a so-called "grip-finger," which moves transversely of the conveyor path to transfer the label to the bottle from a picker, said attachment comprising means whereby the entire length of a body label, capable of extending around the bottle through an arc as great for example, as 295°, is firmly pressed against the bottle and into adhering contact with the latter by pressure-type wipers. A further object is to provide such an attachment which is applicable to that type of machine in which the articles are labeled while moving uninterruptedly along a conveyor path and in which the label-applying and pressing elements move along the conveyor path while manipulating the label and are then retracted from the labeled article and returned, in reverse direction, along the conveyor path, for operative association with another article. A further object is to provide an attachment applicable to a labeling machine of commercial type and which does not require substantial modification of the machine, as a whole, for its installation. A further object is to provide wiping apparatus of simple, inexpensive, but durable construction, capable of pressure-wiping a label throughout an arc of more than 270°.

Other and further objects and advantages of the invention will be pointed out in the following description and by reference to the accompanying drawings wherein:

FIG. 1 is a diagrammatic plan view illustrating a wiper device, according to the present invention, designed to apply pressure for wiping in the end portions of a wrap-around label, and indicating, in a broken line, the path of motion of the carrier for said wiper device, located at one side of the conveyor path;

FIG. 2 is a fragmentary elevation, partly in vertical section, at right angles to the conveyor path, to larger scale than FIG. 5, showing the means for limiting motion of the wiper device of FIG. 1, toward the conveyor path;

FIG. 3 is a plan view, to larger scale, showing the wiper device of FIG. 1, as the wiper pads approach the conveyor path in readiness to receive the bottle between them, preparatory to wiping the ends of the label about the bottle;

FIG. 4 is a view similar to FIG. 7, but showing the parts at the completion of the operation of wiping the ends of the label about the bottle;

FIG. 5 is a view similar to FIG. 3, but showing the wiper pads as having opened out preparatory to withdrawal of the wiper device from the conveyor path, so that the labeled bottle may continue along the conveyor path;

FIG. 6 is a fragmentary plan view showing a bottle operatively related to a pressure-type wiper device, by means of which a label has been wrapped 180° about the bottle, said wiper device being of conventional hinged-type;

FIG. 7 is a vertical section, transversely of the conveyor path of a labeling machine, and omitting many parts, showing a grip-finger in operative relation to an article to be labeled and constituting an element of a labeling machine of the general type of that disclosed, for example, in the patent to Carter, No. 2,946,472, dated July 26, 1960;

FIG. 8 is a diagrammatic plan view, to smaller scale than FIG. 7, showing a grip-finger assembly as having moved from a transfer station, where it received a label, toward the conveyor path, so as to contact the central portion of the label with the side of the bottle; and

FIG. 9 is a view similar to FIG. 8, but showing the grip-finger assembly as having moved still further toward the conveyor path, so as to bring its primary pads into contact with the label, thereby partially to wrap the latter about the bottle, leaving the opposite ends of the label diverging widely toward the opposite side of the conveyor path.

The present invention constitutes an improvement upon the apparatus described in the patent to Carter, No. 2,925,931, dated February 23, 1960, wherein there is disclosed means for applying wrap-around labels to bottle necks, and wherein the bottles are advanced uninterruptedly along a rectilinear path while the labels are being applied, but in the apparatus disclosed in that patent, the wiping of the opopsite ends respectively, of the label, is accomplished by the employment of successively-acting rotating bristle brushes. Under some conditions, a pressure-type wiper is preferable to the bristle brushes, being somewhat more positive in its action, so as to insure firm adhesion of the free ends of the label to the article and, for this reason, the apparatus of the present invention, has been devised wherein the successively-acting bristle brushes of the above patent are replaced by a pressure-type wiper device which, in a single operation, wraps both ends of the label about the article, and wherein the last-named pressure-type wiper device, which wipes in the ends of the label, is disposed at the same side of the conveyor path as the pressure-type wiper which performs the initial wiping operation, whereby the label is wrapped about the bottle through an arc not exceeding 180°.

Referring to the drawings and, in particular, to FIG. 7, an article, specifically a bottle B, to be labeled, is shown as standing upon a flat plate 101 which is one of the article-supporting elements of an endless chain conveyor of conventional type, which is so guided as to provide a horizontal run for moving the articles along a

rectilinear article path through the label-applying zone. This conveyor is moved continuously and the labels are applied to the articles while they move uninterruptedly along the article path. The labels are first adhered to the articles by the employment of a grip-finger assembly, generally similar to that disclosed in FIG. 1 of the patent to Carter, No. 2,925,931, dated February 23, 1960, this assembly comprising the grip-finger device X (FIG. 7), which takes a label from a picker (not shown) at a transfer point and which, by means of a suction pad P (FIGS. 8 and 9) carries the label from the transfer point toward the article path and presses the center portion of the label into adhering contact with the bottle, as illustrated in FIGS. 7 and 8. The grip-finger assembly of FIG. 7 also includes the device Z which is, in general, similar to the device X, but which, in the present instance, acts merely to carry an abutment element 455 into engagement with the article B, so as to prevent the latter from tipping in response to the pressure exerted by the pads P. The two devices X and Z are mounted to rock back and forth upon shafts 409 and 409*a* (FIG. 7), which are rocked by suitable mechanism, such as referred to in the above patent to Carter, No. 2,925,931, and which also move back and forth axially, parallel to the article path, so that the members P and 455 may remain in contact with the bottle as the latter is advanced by the conveyor.

The grip-finger device X comprises not only the pad P (FIG. 8), which moves the center of the gum-coated label into adhering contact with the article, but also two primary pressure-type wipers W^1 and W^2, located at opposite sides of the pad P, and which continue to move toward the article path even after the resilient pad P has contacted the label with the article, so as to press those portions of the label, which are at opposite sides of its midpoint, into contact with the article as shown in FIG. 9, leaving the end portions E of the label projecting toward the opposite side of the article path in widely divergent relation. Having adhered the label to the article, the devices X and Z rock away from the article path, leaving the article free to continue its advance by the conveyor, into the field of action of the wiping means.

In accordance with the present invention, in addition to the primary wiper pads W^1 and W^2, there is a main wiping device and an end-wiping device, both of the pressure type, and each of which is mounted upon an elongate carrier 338 (FIG. 1), which is supported to move in an orbital path by parallel cranks, only one of which is indicated at 333 (FIG. 1), and which are actuated so as to revolve once for each cycle of operation of the machine and thus in accurately timed relation to the conveyor by suitable means, for example, such as is more fully described in the above patent to Carter, No. 2,925,931, but not here shown. Such a wiper device carrier is indicated by the same numeral 338 in the above patent to Carter and, likewise, as shown in said patent, such a carrier, although not here illustrated, similarly supported and actuated, is arranged at the opposite side of the article path defined by the conveyor. The first of the wiper devices to act upon the label, following the presser pads P of the grip-fingers, is of the type illustrated in FIG. 6 of the drawings, and comprises a bracket G mounted upon the carrier 338 at one side of the article path, and another bracket G^1 mounted upon the carrier at the opposite side of the article path. The bracket G carries two wiper arms 10 and 11 respectively, of arcuate shape and pivotally supported at 12 and 13 respectively, and which are urged outwardly away from each other by tension springs 14 and 15. The arms 10 and 11 have secured to their inner faces a flexible resilient presser pad D, which may be of rubber or the like, and which is of a length such that it may embrace the bottle to be labeled through an arc, at least, as great as 180°. The bracket G^1 carries an abutment member T which engages the article at the opposite side of the article path from the bracket G, so as to prevent the bottle from tipping in response to the action of the wiper.

The brackets G and G^1 are desirably mounted on their carriers 338 so that they may yield outwardly away from the conveyor path in response to excessive pressure. Thus, for example, as more fully described in the above patent to Carter, No. 2,925,931, they may be mounted upon the ends of piston rods (not shown), secured to the ends of pistons which slide in pneumatic cylinders 339 mounted on the carriers 338, the cylinders being supplied with air at suitable pressure, such that the pads D and the abutment T, after having been brought into contact with the article as the carriers 338 approach the article path, are stopped by contact with the article while the carriers complete their inward motion, and without damage to the article. As illustrated in FIG. 6, the pad D of the main wiper device has wrapped the label L about the bottle through an arc of approximately 180°, leaving the end portions E of the label extending transversely of the article path and at approximately right angles to the latter.

In accordance with the present invention, the carrier 338 carries a second or end-wiping wiper device K (FIGS. 1, 3, 4 and 5), which is operative, after the article has been disengaged from the pad D and the abutment T, to wrap the end portions E of the label into contact with the article so that the label may embrace the article through an arc as great as 360°.

As illustrated in FIGS. 1, 3, 4 and 5, the wiper device K comprises a bracket 16 which is fixed to one end of the piston rod 342 which is attached to a piston (not shown) in the cylinder 339 (FIG. 1), mounted upon the carrier 338, as more fully described and illustrated in the above patent to Carter No. 2,925,931.

Levers 17 and 18 are pivotally mounted at 19 and 20 respectively, upon the bracket 16 so as to swing toward and from each other, these levers being urged away from each other by springs 21 and 22 connected to lugs 23 and 24 respectively, projecting outwardly from the arms 17 and 18, these springs being anchored at their opposite ends to pins 25 and 26 fixed to the bracket 16. The levers 17 and 18 are arcuate in form and are provided with arcuate resilient, yieldable lining pads D^1 and D^2 respectively, for example of rubber, the inner radius of each pad being substantially equal to that of the surface to which the label is to be affixed, and which are of such arcuate extent that when the levers are at their nearest point of approach, with their free ends in contact, as illustrated in FIG. 4, these two pads D^1 and D^2 embrace the bottle through an arc of approximately 300°. Adjustable stops 27 and 28 limit the outward motion of the levers 17 and 18 in response to the action of the springs 21 and 22. Each of the lever arms 17 and 18 is provided with an outwardly projecting bracket member 29 and 30 respectively, which support cam follower elements, here shown as rotatable rolls 31 and 32, which are engageable, at times, by a cam device M. This cam device M is mounted upon a bracket 33 which is fixed to the end of a piston rod 342*a* similar to the piston rod 342 above referred to, and which is connected to a piston sliding in a cylinder (not here shown), similar to the cylinder 339 above described, and supported by the carrier 338 (not shown) at the opposite side of the conveyor path from the device K. The cam device M has a curved surface 34 which is of such a contour that when the cam device M is advanced toward the article path, by its supporting carrier, concomitantly with the advance of the wiper device K toward the article path, the engagement of the cam surface 34 with the cam follower rolls 31 and 32, causes the lever arms 17 and 18 to be swung inwardly toward each other until they occupy the position shown in FIG. 4 where the free end of the pads are in substantial contact. In so moving toward each other, the inner surfaces of the pads D^1 and D^2 contact the end portions E of the label and wrap said end portions in-

wardly about the article and apply such pressure as to insure a secure and permanent engagement of the end portions of the label with the article. In order to limit the motion of the wiper device K toward the article, so as to avoid tipping the bottle before it is embraced by the pads D^1 and D^2, the bracket **16** is provided with a roller R (FIG. 2) which, by engagement with a fixed stop plate Y (FIGS. 1 and 2), stops the advance of the bracket **16**, just as a contact element **35**, at the end of the bracket **16**, comes into engagement with the circumference of the bottle. As soon as the pads D^1 and D^2 have completed the operation of wiping-in the ends of the label, the carrier starts to move the bracket **16** and bracket **33** away from each other and, in so doing, the cam follower rolls **31** and **32** are disengaged from the cam surface **34**, permitting the springs **21** and **22** to move the levers **17** and **18** in opposite directions until they reach a position such as shown in FIG. 5, where they are separated sufficiently to permit the bracket **16** to be retracted to its outermost position, thus freeing the bottle B to continue along the article path while the carriers **338** return, in following their orbital paths, to their initial position in readiness to perform the wiping operation upon the next succeeding article advancing along the conveyor path.

While herein reference has been made to a "bottle" as the article to be labeled, it is to be understood that the wiping apparatus, of the present invention, is equally useful in wrapping labels through an arc of the order of 360°, about articles, whether cylindrical or of other shape, other than bottles, and while the apparatus, as herein disclosed, has been described as for use in a labeling machine in which the articles move continuously without interruption along the article path, it should be understood that wiping devices, such as those illustrated, for example, in FIGS. 1, 3, 4 and 5, may be employed in machines in which the label is wiped while the article is stationary at a predetermined wiping station. It is further to be noted that, whereas a particular type of wiper device has been suggested as desirable for performing the first main wiping operation, wherein the label is wrapped through an arc of approximately 180°, other types of wiper may be useful for this particular purpose and, likewise, that whereas one specific type of grip-finger assembly has been suggested as desirable for performing the initial affixing of the center of the label to the article, other and equivalent means may be provided for performing this particular function, and it is further to be observed that, whereas one specific pressure-type wiper device for completing the wiping of the ends of the label so as to wrap it through an arc of approximately 300° has herein been specifically illustrated and described, other and equivalent means for performing the same operation are to be understood as within the purview of the invention as defined in the accompanying claims.

I claim:

1. In combination, in a labeling machine of the kind wherein articles to be labeled are advanced uninterruptedly by a conveyor along a predetermined rectilinear path and wherein a wiper carrier, located at one side of said path, moves in timed relation to the conveyor in a circular orbit, said machine comprising means for adhering the central portion of a gum-coated label to that surface of the article which is at one side of said path, and wherein, a main wiper device supported by said carrier, wraps the label about the article through an arc of approximately 180°, characterized in having a pressure-type end-wiping device, said end-wiping device comprising opposed, padded, relatively movable, arcuate lever arms operative collectively to embrace the article through an arc of the order of 300° with their free ends approximately in contact, means operative to separate said arms as the carrier moves toward the conveyor path, thereby to admit the article between them, means operative to apply force to the free ends of said lever arms so as to close the arms about the article, thereby to wipe the free ends of the label into adhering contact with the article, and means operative thereafter to separate the arms at the completion of the wiping operation, thereby to permit the wiper to be withdrawn laterally from the path of the article.

2. Label-wiping apparatus according to claim 1, wherein the lever arms of the end-wiping pressure-type wiper device are mounted upon a bracket so as to turn about spaced vertical axes, spring means normally urging said arms to swing away from each other about said axes, cam means operative, at times, to move said arms toward each other, and means supporting said cam means to move toward and from arm-actuating position.

3. Apparatus according to claim 2, wherein the bracket to which the lever arms of the end-wiping device are pivoted, is so mounted upon the wiper carrier that it may slide, relatively to the latter, toward or from the article path, means yieldingly urging the bracket toward the article path, and a stop engageable by the bracket, as the latter moves toward the article path thereby so to limit its advance as to prevent tipping of the article by the action of the wiper device.

4. In combination, in a labeling machine of the kind wherein articles to be labeled are advanced uninterruptedly by a conveyor along a predetermined rectilinear path, and wherein a wiper carrier, located at one side of said path, moves in timed relation to the conveyor in a circular orbit, said machine comprising means for adhering the central portion of a gum-coated label to that surface of the article which is at one side of said path, and wherein a main wiper device, supported by said carrier, wraps the mid-portion of the label about the article through an arc of 180°, and wherein an end-wiping pressure-type wiper device, also mounted upon said carrier, comprises relatively movable, opposed, arcuate lever arms operative collectively to embrace the article through an arc of the order of 300°, characterized in having cam means, which is operative, at times, to move said arms toward each other, thereby so to close them about the article that their free ends are juxtaposed, located at the opposite side of the article path from said end-wiping device, and cam-actuating means operative to move the cam means toward and from the article path, said cam-operating means being so timed with relation to the motion of the wiper carrier, as to move the cam means toward the article path as the end-wiping device approaches the article to be labeled.

5. The combination according to claim 4, wherein the cam means which acts to close the wiper arms about the article is mounted upon a carrier similar to that which supports the wiper devices and which revolves in an orbital path like that of the wiper device carrier, but in the opposite direction.

6. A labeling machine of the kind wherein a bottle to be labeled is moved uninterruptedly along a predetermined article path, a conveyor for so moving the bottle, means for adhering the central part of a gum-coated label to the side of the bottle while the latter is so moving, a pressure-type wiper device operative to wipe the mid-portion of the label into contact with the bottle through an arc of approximately 180°, an end-wiping device for wiping the end portions of the label about the bottle, a carrier upon which both of said wiper devices are mounted, means for actuating said carrier so as to move both of said wiping devices bodily toward or from the article path, and also longitudinally of said path, characterized in that both of said wiper devices are of the pressure-type and further characterized in that the end-wiping device is so constructed and arranged that, at the completion of its wiping action, it embraces the bottle through an arc of the order of 300° and holds the free ends of the label in firm contact with the bottle.

7. Label-applying apparatus according to claim 6, wherein the pressure-type wiper device, which wipes in the end portions of the label comprises two lever arms pivotally mounted to swing about parallel axes, each arm

carrying an arcuate pressure pad, said pads collectively forming an arc of the order of 300°, spring means urging said arms to swing away from each other, and a roller mounted on each of said arms near the free end, and a cam device which, by engagement with said rollers, moves the free ends of said arms toward each other.

8. Label-applying apparatus according to claim 6, wherein the wiper device, which wipes in the ends of the label about the article, comprises two lever arms, each pivotally mounted adjacent one end, the pivotal axes of said arms being spaced and parallel, spring means urging the free ends of said arms away from each other, and a cam follower element adjacent to the free end of each respective arm, a cam device, and means for moving said cam device bodily toward or from the article path, said cam device comprising a cam surface engageable with the cam follower elements of the respective arms, the parts being so constructed and arranged that as the cam device moves toward the article path, said cam surface engages

the cam follower elements and swings the free ends of the arms toward each other.

9. Label-applying apparatus according to claim 8, wherein the wiper device, which wipes in the ends of the label, is so mounted upon the carrier which supports it that it may move relatively to the carrier toward or from the article path, yieldable means normally urging it toward the article path relatively to the carrier, and stop means operative to limit the motion of approach of the wiper toward the article path.

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