Dec. 12, 1967 C. T. WALTER 3,357,554

CAN END PACKAGE

Original Filed March 28, 1963 4 Sheets-Sheet 1

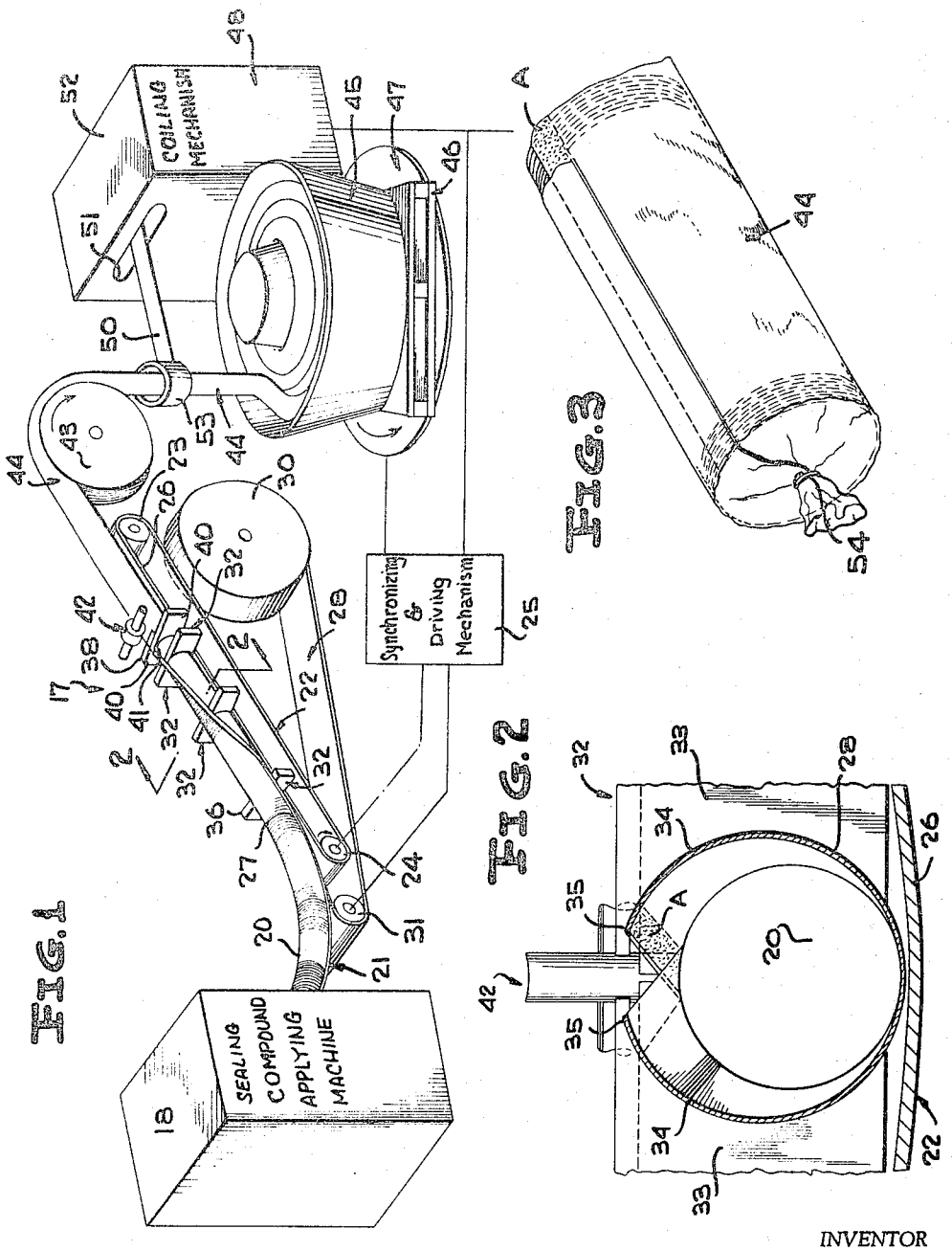


FIG. 1

FIG. 2

FIG. 3

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Fig. 4

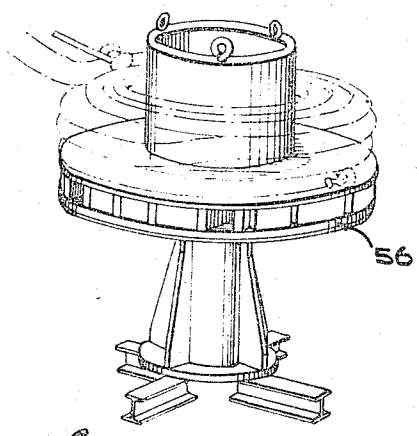


Fig. 5

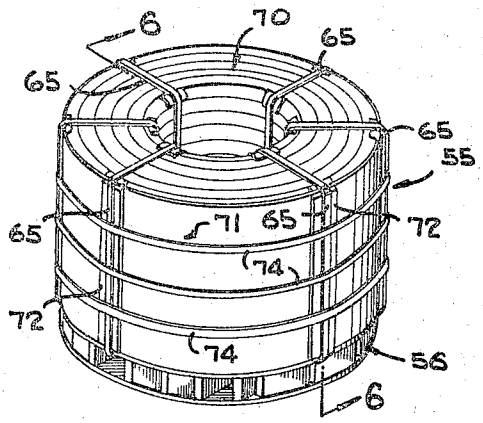


Fig. 6

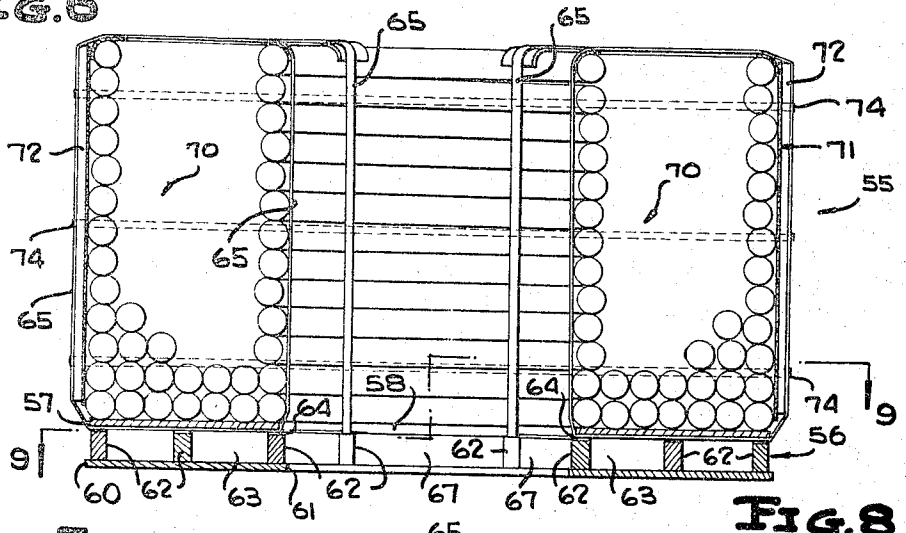


Fig. 7

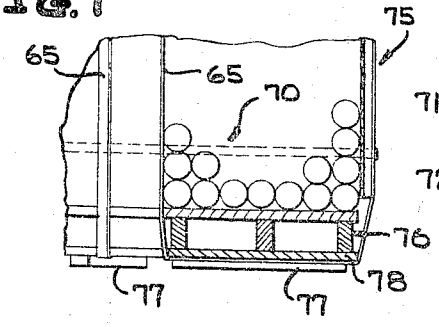
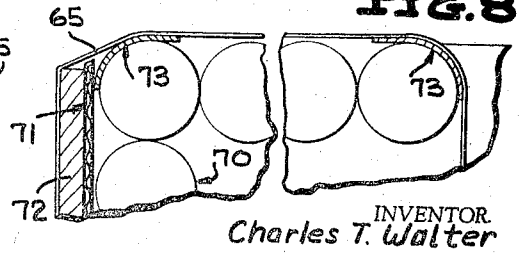


Fig. 8



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Fig. 9

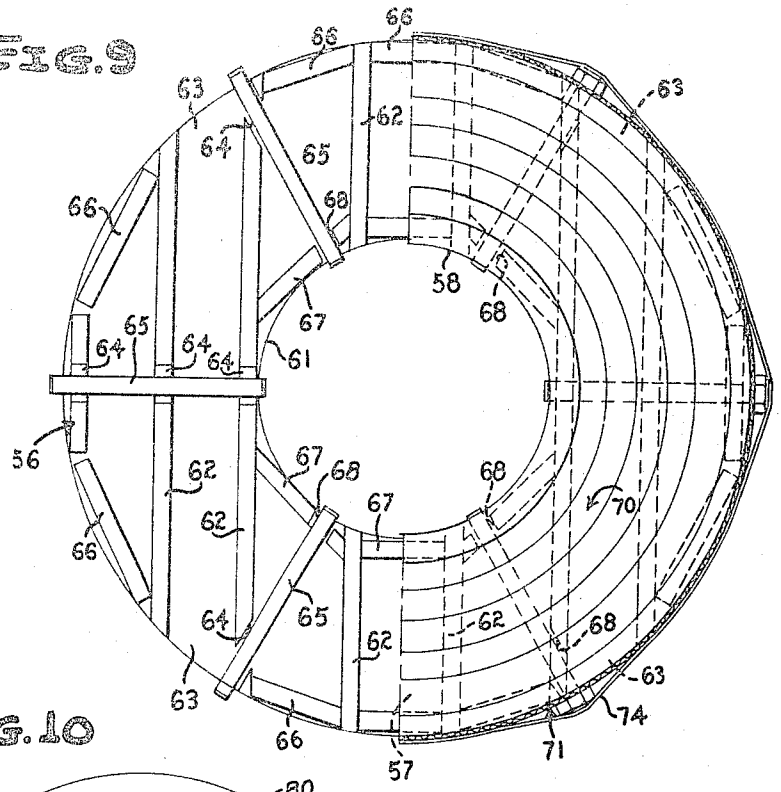


Fig. 10

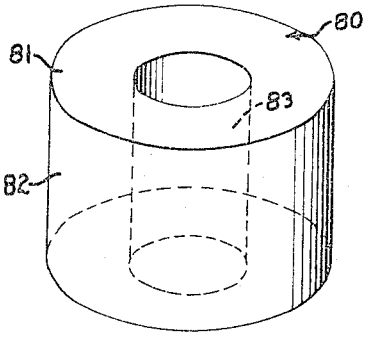
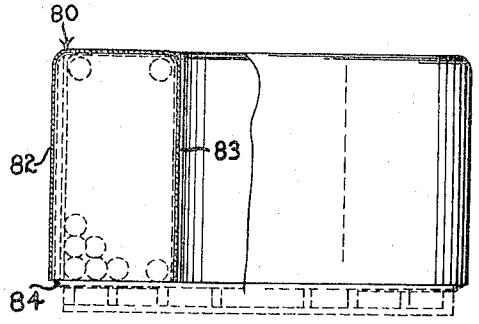


Fig. 11



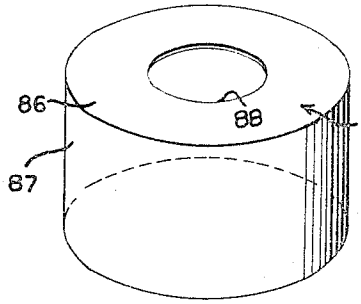


Fig. 12

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Fig. 13

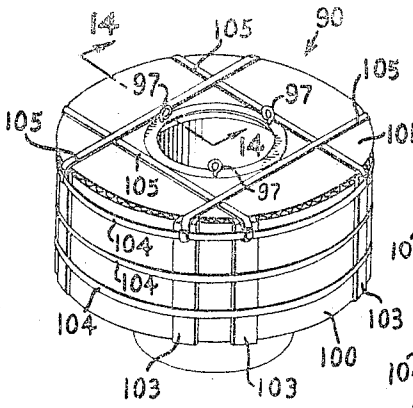


Fig. 14

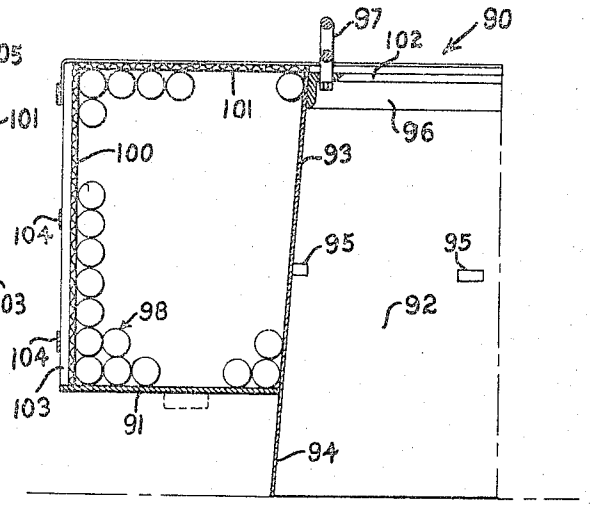


Fig. 15

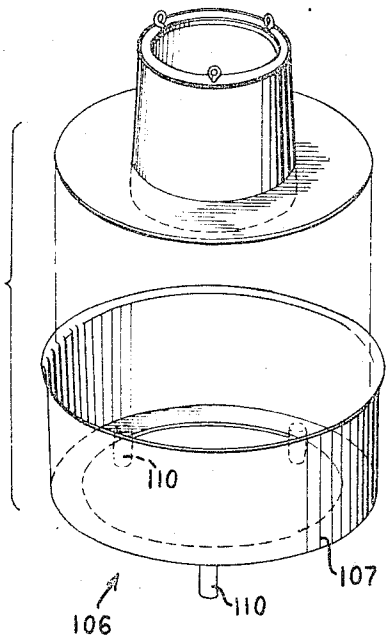
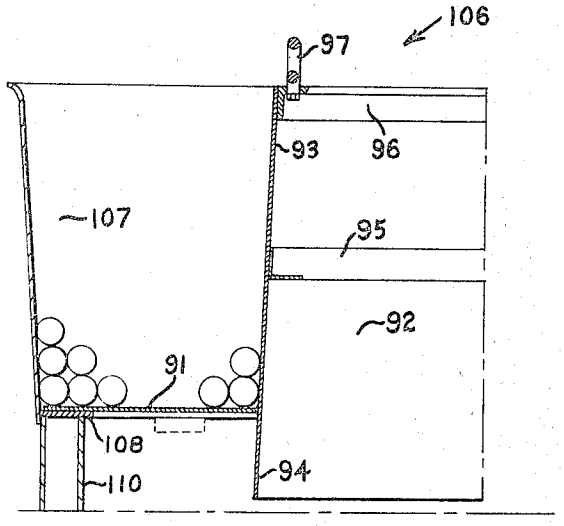


Fig. 16



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United States Patent Office 3,357,554 Patented Dec. 12, 1967

3,357,554

CAN END PACKAGE

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Original application Mar. 28, 1963, Ser. No. 268,633, now Patent No. 3,266,215, dated Aug. 16, 1966. Divided and this application June 3, 1966, Ser. No. 555,080

19 Claims. (Cl. 206—65)

ABSTRACT OF THE DISCLOSURE

This invention relates to a flexible can end package formed from a tubular strip of material in which can ends are packaged in end-to-end relationship. The can end package is coiled, and means are provided for maintaining the coiled configuration thereof. The package thus formed may be palletized or otherwise packaged for storage and/or shipment.

This is a division of my copending, commonly assigned application Ser. No. 268,633, filed Mar. 28, 1963, issued Aug. 16, 1966 and now Patent No. 3,266,215.

At the present time can ends are packaged in paper bags of a length of about two to three feet. As the can ends come out of a sealing compound applying machine, they are formed into a stack at about a rate of one inch per second. When the stack of can ends has a length of about two to three feet, an operator removes a predetermined length of the can ends from the stack. The removed can ends are then placed in a jig for insertion into a bag, after which the bag is sealed.

The bags of can ends are placed into a large carton for shipment to a customer's plant. At the customer's plant the carton is placed close to a can end seaming machine for unloading the individual bags of can ends into a can end feed chute of the seaming machine. Since a can end seaming machine will use up stacked can ends at a rate of about one inch per second, it will be appreciated that the feeding of can ends is a laborious and time consuming operation.

It is therefore an object of this invention to provide a novel can end packaging system which substantially eliminates the labor in a can plant of loading a plurality of can ends into individual bags and loading the individual bags into cartons.

A further object of this invention is the provision of a novel can end packaging system which substantially eliminates the labor involved at a customer's plant in unloading a plurality of individual bags of can ends from a carton and subsequently unloading the can ends from the individual paper bags.

Still another object of this invention is to provide a novel can end package formed from a flexible strip of paper stock material having overlapped longitudinal edges adhesively secured together and opposite end portions of the flexible tubular strip of paper stock material being gathered and secured, whereby the flexible tubular package can be deformed or bent without rupture of the strip of paper stock material during the feeding of the can ends to applicable can making apparatus.

A further object of this invention is to provide a novel package of coiled can ends including a circular pallet having an upper support member with a central circular opening therein, a coiled tubular member formed from flexible material and encasing a plurality of can ends in face-to-face relationship supported upon the uppermost support member between a peripheral edge thereof and the central circular opening, a cylindrical member telescopically surrounding the coiled tubular member, a

plurality of protecting pieces overlying portions of the coiled member, and a plurality of straps securing the coiled member upon the pallet.

Still another object of this invention is to provide a novel package of coiled can ends comprising a support member, a coiled tubular flexible member encasing a plurality of can ends in face-to-face relationship resting upon the support member, and particularly characterized in that the minimum coil diameter of the tubular flexible member is proportional to the diameter of the can ends encased by the tubular flexible member.

Yet another object of this invention is to provide a novel package of coiled can ends wherein a circular support member is provided with an upstanding frustoconical member, a flexible tubular member encasing a plurality of can ends in face-to-face relationship coiled about the frusto-conical member, a substantially cylindrical member telescopically surrounding the coiled tubular member, a cover having a central aperture in axial alignment with the frusto-conical member overlying the coiled tubular member and a plurality of straps securing the cover and the cylindrical member to the coiled tubular member.

Another object of this invention is the provision of a novel package of coiled can ends of the character immediately above described wherein the cylindrical member includes an inwardly directed peripheral flange underlying the support member, a plurality of legs being circumferentially spaced around said flange and depending therefrom whereby the package of the coiled can ends is entirely supported by the legs thereof.

With the above, and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a schematic perspective view of a can end packaging system constructed in accordance with this invention, and illustrates a plurality of can ends in face-to-face relationship being wrapped and coiled in a sheet of flexible material.

FIGURE 2 is an enlarged fragmentary sectional view taken along line 2—2 of FIGURE 1, and illustrates a pair of cooperative forming means guiding the strip of flexible material about the plurality of can ends prior to complete encasement thereof.

FIGURE 3 is a fragmentary perspective end view ot a tubular can end package constructed in accordance with this invention and shows a plurality of can ends in face-to-face relationship encased in a flexible strip of paper stock material which has been wrapped about the plurality of can ends with the longitudinal edges thereof adhesively secured together, and an end portion of the tubular package being closed by a clamp.

FIGURE 4 is a top perspective view of a can end package unloading turntable located at a customer's canning plant, and illustrates a pallet resting atop the turntable, a container supported by the pallet and, in phantom lines, a flexible tubular package of can ends partially coiled about and seated upon the container.

FIGURE 5 is a top perspective view of a coiled can end package, and illustrates a flexible, tubular member coiled upon itself and supported by a pallet, a cylindrical member telescopically surrounding the coiled tubular member and a plurality of straps overlying, protecting and reinforcing elements, and securing the coiled tubular member upon the pallet.

FIGURE 6 is an enlarged sectional view taken along line 6—6 of FIGURE 5, and shows a pair of axially aligned central openings in upper and lower support members of the pallet and a slot in each one of a plurality of spacing members between the support members

of the pallet for threadably receiving the plurality of straps therethrough.

FIGURE 7 is a fragmentary vertical sectional view of a package similar to the package of FIGURES 5 and 6 but differing therefrom in that a plurality of straps securing a coiled, tubular, can end encasing member upon a pallet underlies a bottom support member thereof.

FIGURE 8 is an enlarged fragmentary vertical sectional view of the package of coiled can ends of FIGURES 5 through 7, and illustrates a pair of protecting pieces overlying portions of the tubular can end encasing member to protect the same from rupture by the securing straps.

FIGURE 9 is a transverse jump sectional view taken along line 9—9 of FIGURE 6, and more clearly illustrates the construction of the coiled can end package.

FIGURE 10 is a top perspective view of a cover for a package of coiled can ends, and shows an outer skirt depending from an end portion of the cover and a coaxial depending inner skirt.

FIGURE 11 is a side elevational view, with parts broken away and shown in section, of the cover of FIGURE 10, and illustrates the cover completely telescoped about a package of coiled can ends.

FIGURE 12 is a top perspective view of a cover for a package of coiled can ends, similar to the cover of FIGURE 10, but lacking an inner coaxial skirt portion.

FIGURE 13 is a top perspective view of another package of coiled can ends, and illustrates a cylindrical member and a centrally apertured cover secured by a plurality of straps and enclosing a coiled, tubular, can end encasing member therein.

FIGURE 14 is an enlarged fragmentary sectional view taken along line 14—14 of FIGURE 13 and shows the tubular can end encasing member coiled about an upstanding centrally located frusto-conical member.

FIGURE 15 is an exploded top perspective view of a container for coilably receiving a plurality of can ends packaged in accordance with this invention, and shows a substantially cylindrical top having an inwardly directed peripheral flange and a plurality of depending legs, the cylindrical top having a diameter slightly larger than the diameter of an annular supporting member secured to a frusto-conical central portion about which a plurality of encased can ends may be coiled.

FIGURE 16 is an enlarged fragmentary vertical sectional view of the container of FIGURE 15, and shows the annular support member resting upon the inwardly directed peripheral flange of the cylindrical tub.

An apparatus constructed in accordance with this invention for packaging a plurality of can ends in face-to-face relationship is best illustrated in FIGURE 1 of the drawings and is generally designated by the reference numeral **17**. The can end packaging apparatus **17** is located near the discharge end of a sealing compound applying machine **18**. The sealing compound applying machine **18** guidably discharges finished can ends **20** along an inclined conveyor **21** to a first end of a driven conveyor belt **22**. The conveyor belt **22** is entrained over an idler pulley **23** at a discharge end of the conveyor belt **22**, and similarly entrained over a driven pulley **24** adjacent the inclined conveyor **21**. The pulley **24** is driven by a drive shaft (not shown) of the synchronizing and driving mechanism **25**. An upper conveyor belt run **26** of the conveyor belt **22** transports the plurality of can ends **20** in the direction of the arrow **27**.

A strip of flexible paper stock material **28** is continuously drawn off a freely rotatable supply roll **30** by a feed roll **31**. The feed roll **31** is driven in the same direction and at the same speed as the drive pulley **24** of the conveyor belt **22** by the synchronizing and guiding mechanism **25**. As is clearly shown in FIGURE 2 of the drawings, the strip of flexible paper stock material is fed by the feed roll **31** between the upper conveyor belt run **26** and the plurality of can ends **20**. A plurality of forming means **32** are spaced along the upper conveyor belt run **26** between the drive pulley **24** and the idler pulley **23**. Since the plurality of forming means **32** are substantially identical, a description of one of the plurality of forming means **32** is considered sufficient for a complete understanding of this invention.

The forming means **32** shown in FIGURE 2 of the drawings includes a pair of identical, opposed forming guide blocks **33**. Each of the forming guide blocks **33** of the forming means **32** includes a concave forming surface **34** terminating at an upper end thereof in a shoulder **35**. Each of the shoulders **35** of guide blocks **33** confiningly guide an associated longitudinal edge of the flexible strip of paper stock **28**.

Each of a first pair of forming guide blocks **36** of the plurality of forming means **32** is provided with an arcuate forming surface **37** and is devoid of a guiding and retaining shoulder, such as the shoulder **35** of FIGURE 2. Because the flexible strip of paper stock material **28** is gradually and progressively wrapped about the plurality of can ends **20**, the initial forming guide blocks **36** need not be provided with guiding shoulders.

A last forming guide **38** of the plurality of forming means **32** includes a pair of identical guiding and forming blocks **40** provided with identical opposed concave forming surfaces **41** terminating at an associated guiding shoulder (not shown) identical to the guiding shoulders **35** of FIGURE 2. However, the guiding and forming blocks **40** of the forming guide **38** are in side-to-side abutment and the guiding shoulder of each of the bodies **40** extends beyond the axial center of the plurality of can ends **20** whereby the longitudinal edges of the flexible strip of paper stock material are overlapped.

Adjacent the last forming guide **38** of the plurality of forming means **32** and in overlying relationship to the upper conveyor belt run **26** is a freely rotatable sealing roller **42**. As shown in FIGURE 2 of the drawings, a longitudinal edge of the flexible strip of paper stock material **28** is provided with a marginal coating of thermoplastic adhesive A. The sealing roll **42** is heated in a manner well known in the prior art and as the longitudinal overlapped edges of the flexible strip of paper stock material are brought into tight overlapping relationship by the last forming guide **38**, the heated sealing roll **42** seals the overlapped edges to form a longitudinal seam.

The encased plurailty of can ends **20** is transported to a freely rotatable support roll **43** which is mounted adjacent the discharge end of the conveyor belt **22**. The diameter of the support roll **42** is at least as large as the minimum diameter that the plurality of can ends **20** encased in the flexible strip of paper stock material **28** can be subsequently coiled into without rupturing the paper stock material or damaging the can ends. That is, the diameter of the support roll **43** is directly dependent upon the minimum diameter into which the encased can ends **20** may be coiled without rupturing the paper stock material **28**. As will be more clearly described hereafter, the minimum diameter of the support roll **43** and the minimum diameter that the can ends **20** can be coiled into without breaking the paper stock material **28** depends upon the diameter of the can ends **20**.

The plurality of can ends **20** encased by the paper stock material **28** forms a flexible, tubular can end package **44** that extends downwardly from the support roll **43** into a cake pan shaped container **45** seated upon a pallet **46** which in turn is supported by a rotatable turntable **47**. The turntable **47** is driven and synchronized by the synchronizing and driving mechanism **25** to insure a proper rotational speed of the turntable **47** relative to the speed at which the flexible tubular can end package **44** is being formed and fed into the container **45**.

A coiling mechanism **48** includes a movable coiling arm **50** passing through a slot **51** in a housing **52** of the coiling mechanism **48**, the end of the coiling arm **50** in the coiling mechanism **48** is provided with a cam fol-

lower (not shown) which is actuated by a cam (also not shown) in the coiling mechanism 48, journalled, driven and synchronized by the synchronizing and driving mechanism 25. A guiding sleeve 53 integral with the coiling arm 50 slidably receives therethrough the flexible tubular can end package 44. Due to the synchronism between the speed of rotation of the turntable 47 and the movement of the coiling arm 50 of the coiling mechanism 48, the flexible tubular can end package 44 is coiled in the container 45 in an orderly fashion.

Upon completion of the filling of the container 45, the can end packaging apparatus 17 is shut down and the flexible tubular can end package 44 is broken above the container 45. The flexible material at the broken end of the tubular can end package 44 in the container 45 is gathered, as shown in FIGURE 3, and clamped by a resilient piece of wire 54 to form a completely enclosed and encased can end package. A portion of the tubular can end package 44 which is vertically dangling from the support roll 43 is closed in a manner identical to that shown in FIGURE 3.

The pallet 46 and container 45 are then removed by means of a fork lift truck from atop the turntable 47. An empty container is then set in place on the turntable 47 and the machinery is again started to begin the operation of the can end package apparatus 17.

A coiled can end package 55 is shown in FIGURES 5, 6, 8, and 9 of the drawings and includes a pallet 56. The pallet 56 includes an upper circular support member 57 having a central opening 58 and a lower identical support member 60 having a central opening 61 axially aligned with the central opening 58 of the upper support member 57. A plurality of identical, parallel, elongated spacers 62 are secured between the support members 57 and 60 and maintain the same in spaced relationship. A pair of access openings 63 open peripherally outwardly of the pallet 56 between two pairs of adjacent spacers 62, as is clearly illustrated in FIGURE 9 of the drawings. The distance between adjacent access openings 63 corresponds to the distance between the tines of a fork lift truck in order that the coiled can end package 55 may be readily and easily manipulated. Each of the plurality of spacers 62 is slotted identically at 64 for the package therethrough of a respective one of a plurality of securing straps 65. A plurality of spacers 66 are secured between the support members 57 and 60 along the outer periphery of the pallet 56. A plurality of inner spacer members 67 are secured between the support members 57 and 60 immediately adjacent the axially aligned central openings 58 and 61. A plurality of notches 68 in the innermost spacers 67 are aligned with a respective notch 64 in an adjacent elongated spacer 62. Each pair of aligned, cooperative notches 64 and 68 threadedly receive therethrough one of the plurality of securing straps 65.

A flexible, tubular, can end encasing package is coiled about itself and rests upon the upper support member 57 of the pallet 56. A substantially cylindrical member 71 constructed preferably of corrugated paper board is telescoped about the periphery of the tubular can end package 70. A plurality of elongated wooden reinforcing strips 72 are arranged in spaced relationship about the periphery of the cylindrical member 71. As is best illustrated in FIGURE 8 of the drawings, a pair of protecting pieces 73, constructed from heavy paper overlie upper portions of the coiled, tubular can end package. Each of the pair of protecting members 73 is associated with one of the plurality of wooden reinforcing strips 72 in a manner clearly shown in FIGURE 8. Each of the supporting straps 65 is preferably formed of steel or other similar metal which would rupture the tubular can end encasing package 70. However, due to the protector pieces 73 between those portions of the tubular can end encasing package which would contact the securing straps 65, rupturing of the tubular can encasing package 70 is precluded.

A plurality of axially spaced metallic straps 74 are secured about the periphery of the coiled can end package 55 in overlying relationship to the securing straps 65 and the wooden reinforcing strips 72.

In this manner, should any one of the plurality of securing straps 65 break, the axially spaced securing straps 74 maintain the coiled can end package 55 adequately secured.

Illustrated in FIGURE 7 of the drawings is a coiled can end package identical to the coiled can end package 55. However, a pallet 76 of the coiled can end package 75 is devoid of strap receiving grooves or notches. Rather, a plurality of shallow legs 77 project radially outwardly from the axial center of the pallet 76 and are peripherally arranged and secured to a lower support member 78 of the pallet 76. Thus, the securing straps 65 may be passed between the lower support member 78 and a surface upon which the coiled can end package 75 is resting in order that the tubular can end encasing package 70 may be easily and efficiently secured to the pallet 76.

A coiled can end package cover 80 is illustrated in FIGURE 10 of the drawings and includes an end portion 81 and an integral and depending peripheral outer skirt 82. A depending inner skirt 83 is coaxilly arranged with respect to the outer skirt 82 of the cover 80. The diameter of the outer skirt 82 is slightly larger than the outer diameter of a coiled can end package, such as the coiled can end package illustrated in phantom outline in FIGURE 11, whereby the cover 80 may be easily telescoped thereover. Similarly, the coaxial inner skirt 83 of the cover 80 has a diameter slightly smaller than the minimum coiled diameter of the coiled can end package to facilitate the insertion of the inner skirt 83 between the coils of minimum diameter.

The cover 80 is preferably constructed from metal, and is slightly shallower than the total height of a coiled can end package with which it is associated. In this manner, a lower peripheral edge 84 terminates above the pallet of the coiled can end package and permits the tines of a fork lift truck to be inserted into access openings in the pallet.

A metallic coiled can end package cover 85 illustrated in FIGURE 12 of the drawings includes a centrally apertured end portion 86 and an integral depending peripheral skirt 87. The aperture 88 in the cover 85 is formed therein for a purpose to be more fully explained hereafter. The cover 85 functions in a manner identical to that performed by the cover 80 of FIGURES 10 and 11.

It has been previously mentioned that the diameters of the can ends 20 of FIGURE 1 directly influence the diameter of the support roll 43, as well as the minimum diameter into which the tubular flexible can end package 44 may be coiled. The diameters of the axially aligned central openings 58 and 61 in the pallet 56, the diameter of the inner skirt 83 of the cover 80 and the diameter of the aperture 88 in the cover 85 are also dependent upon the diameter of the encased can ends.

Based on the fact that the flexible crepe paper stock material now used to encase a plurality of can ends in accordance with this invention will stretch about 25%, Table I, immediately below, shows that a minimum coiled diameter is approximately eight times greater than the diameter of the can ends being encased by the flexible paper stock material. For example, a size 211 can end has a three inch diameter and can be coiled to a minimum coil diameter of twenty-four inches. An attempt to reduce the minimum coil diameter below twenty-four inches when the flexible crepe paper stock material will only stretch to a maximum of about 25% would result in the rupture of a tubular can end package encasing the size 211 can ends.

Similarly, if the plurality of can ends 20 of FIGURE 1 were size 211 can ends, the diameter of the support roll

43 must be twenty-four inches or greater, otherwise the tubular can end package 44 would rupture as it bends about the periphery of the support roll 43.

Assuming that the coiled can end package 55 of FIGURE 6 is constructed for packaging size 211 can ends, the preferred diameters of the axial aligned central openings 58 and 61 in the pallet 56 should be twenty-four inches or greater. Furthermore, if it is again assumed that the cover 80 of FIGURE 10 is to be telescoped about the coiled can end package 55 of FIGURE 6, the inner coaxial skirt 83 of the cover 80 must be somewhat less than the minimum coil diameter in order to be easily received by the coiled can end package 55.

TABLE I.—MINIMUM COIL DIAMETERS FOR VARIOUS DIAMETER CAN ENDS

Can End, Size	Can End, Diameter	Minimum Coil, Diameter
202	2.40	19.2
211	3.00	24.0
300	3.25	26.2
303	3.43	27.4
307	3.68	29.4
401	4.31	34.4
404	4.53	36.2

In FIGURES 13 and 14 is illustrated a coiled can end package 90 having a circular support member 91 provided with a central frusto-conical member 92. The frusto-conical member 92 includes an upper portion 93 extending above the support member 91 and a lower portion 94 depending below the support member 91. The interior of the frusto-conical member 92 is provided with a plurality of peripherally arranged stops 95 which determine the position of a plurality of the coiled can end packages 90 when emptied and internested. A circular L-shaped bar 96 is secured at the upper portion 93 of the frusto-conical member 92 and is provided with a plurality of peripherally spaced eye-bolts 97. The support member 91 and the frusto-conical member 92 form a container adapted to be seated directly upon the rotatable turntable 47 of the can end packaging apparatus 17 of FIGURE 1.

A tubular, flexible can end encasing package 98 is coiled about the frusto-conical member 92 in a manner similar to the coiling of the tubular can encasing package 44 into the container 45 of FIGURE 1. It should be noted that the uppermost end portion of the frusto-conical member 92 must have a diameter corresponding to the minimum diameter into which the can end package 98 may be coiled. That is, if size 211 can ends are encased in the can end package 98, the minimum diameter of the frusto-conical member at an uppermost portion thereof must be not less than twenty-four inches.

After the can end package 98 is coiled about the frusto-conical member 92, the same is removed from the rotatable turntable 47 by a lift truck, the tines of which can underlie the support member 91 on opposite sides of the frusto-conical member 92, as shown in phantom lines in FIGURE 14.

A substantially cylindrical member 100 constructed of corrugated paper board is telescoped about the coiled can end package 90. A cover 101 having a central aperture 102 is positioned atop the encased can end package 98. It is to be noted that the diameter of the aperture 102 in the cover 101 corresponds to the minimum diameter of the frusto-conical member 92 and the minimum diameter of the coiled, encased can ends 98. By thus dimensioning the aperture 102 in the cover 101, the eye-bolts 97 extend upwardly beyond the cover 101 and the encased can ends 98 are completely covered. Thus, the diameter of the aperture 102 in the cover 101 again depends directly upon the size of the can ends encased by the coiled tubular encasing member 98.

A plurality of wooden reinforcing strips 103 are arranged about the periphery of the cylindrical member 100. A plurality of axially spaced peripheral straps 104, preferably constructed of metal, secure the vertical reinforcing strips 103 to the cylindrical member 100. Four metallic securing straps 105 each extend across the cover 101 and have opposite ends thereof secured to an uppermost one of the peripheral straps 104. The coiled can end package 90 is now ready for shipment and may be moved from the area at which it was packaged by means of a lift truck in the manner previously discussed or, the coiled can end package 90 may be lifted by an overhead hoist by means of the plurality of peripherally arranged eye-bolts 97.

Illustrated in FIGURES 15 and 16 of the drawings is a container 106 adapted to receive therein a plurality of encased, coiled can ends. The container 106 includes a substantially circular support member 91 provided with a central frusto-conical member 92 having an upper portion 93 extending above the support member 91 and a lower portion 94 depending below the support member 91. A circuit L-shaped spacing member 95, performing the function of the spacing members 95 of FIGURE 14, is secured internally of the frusto-conical member 92. A circular L-shaped member 96 is provided with a plurality of peripherally spaced eye-bolts 97 and secured to an uppermost edge portion of the frusto-conical member 92.

The frusto-conical member 92 and the support member 91 thereof is telescopically received in a substantially cylindrical tub member 107 having an inwardly directed peripheral flange 108 at a lowermost end portion thereof. A plurality of support legs 110 are secured to a lowermost surface of the inwardly directed flange 108 of the cylindrical tub 107. The length of each of the support legs 110 is slightly longer than the length of the lowermost portion 94 of the frusto-conical member 92 depending below the support member 91. As is clearly illustrated in FIGURE 16 of the drawings, the plurality of legs 110 support the frusto-conical member in spaced relation to a support surface. In this manner, the plurality of support legs 110 provide ample height for the tines of a fork truck (shown in phantom lines) to be inserted beneath the inwardly directed flange 108 on opposite sides of the frusto-conical member 92.

A cover, (not shown) similar to the cover 101 of FIGURE 13 is secured atop the container 106 after a plurality of encased can ends have been coiled into the tub 107.

Each of the coiled can end packages heretofore described are shipped to a product canning plant, at which time the coiled can end package is placed upon a turntable, such as the turntable of FIGURE 4. The turntable of FIGURE 4 is adjacent an end seaming machine (not shown) which is to be fed a plurality of can ends from the coiled package. The feeding of the encased can ends to an end seaming machine forms no part of this invention, and it is only necessary to point out that the encased can ends are uncoiled from the coiled can end package and fed by suitable means to an end seaming machine.

While a plurality of can end packages and an apparatus for forming the same have been disclosed herein, it is to be understood that various modifications will be apparent to one skilled in the art and are intended to be included in this invention. For example, it is within the scope of this invention to form the can end package by coiling the flexible, tubular can end encasing member about a spool-shaped member, similar to the conventional spools.

It is also to be understood that while example disclosures of can end packages and an apparatus for forming the same are shown herein, changes in the can end package or the can end packaging apparatus and the components thereof may be made without departing from the

spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. The combination of a plurality of can ends and a flexible package therefor, said can ends being in face-to-face relationship to each other and forming an elongated radially shiftable column, an elongated flexible tubular member confiningly encasing said can ends and limiting the radial shifting thereof, said flexible tubular member having means at opposite end portions thereof for closing the latter whereby the can ends are maintained in face-to-face relationship while arcuate bending of the flexible tubular member is permitted in the absence of rupture thereof, said flexible tubular member being bent beyond 360 degrees to form a coiled package, and means are provided for maintaining the coiled configuration of said coiled package.

2. The combination as defined in claim 1 wherein said can ends each include inner and outer surface portions, each of the latter being adapted to define an exterior surface portion of a can body and each of the former being adapted to define an interior surface portion of an associated can body, and said can ends being disposed in said column with the inner and outer surface portions of adjacent ones of the can ends in opposed relationship whereby, upon the opening of one of said end portions, said can ends can be directly fed into selected can making apparatus with all of one of the inner and outer surface portions facing in the same direction.

3. The combination, as defined in claim 2, wherein said flexible tubular member is an elongated strip of flexible material having longitudinal edge portions, means securing together said longitudinal edge portions, and said closing means are defined by separate securing means securing closed said opposite end portions.

4. The combination as defined in claim 1 wherein said flexible tubular member is an elongated strip of flexible material having longitudinal edge portions, means securing together said longitudinal edge portions, and said closing means are defined by separate securing means securing closed said opposite end portions.

5. The combination as defined in claim 1 wherein said flexible tubular member is an elongated strip of flexible material having longitudinal edge portions, means securing together said longitudinal edge portions, said opposite end portions being formed by gathered portions of said flexible material, and said closing means being effective for securing said gather portions and preventing the unravelling thereof.

6. The combination as defined in claim 1 wherein said can ends are of a diameter of at least 2 inches and the minimum diameter of the coiled package is approximately 19 inches.

7. The combination as defined in claim 1 wherein said can ends range in diameter approximately between 2 to 5 inches and the minimum diameter of the coiled package ranges approximately between 19 to 40 inches.

8. The combination as defined in claim 1 wherein said can ends range in diameter approximately between 2 to 4½ inches and the diameter of the coiled package ranges approximately between 19 to 36 inches.

9. A coiled article package comprising a support member, a control opening in said support member, means secured to and depending from an underside of the support member for maintaining the support member in spaced relation to a supporting surface, a plurality of generally flat disc-like articles housed in a coiled tubular member, said coiled member being supported by said support member, and means securing coiled tubular member upon said support member.

10. The package as defined in claim 9 wherein said securing means include at least one elongated tie-down member, and said tie-down member passes through said central opening and at least partially surrounds said coiled tubular member.

11. The package as defined in claim 9 wherein the minimum diameter of said coiled tubular member is proportional to the diameter of the disc-like articles housed in the coiled member.

12. A coiled article package comprising a support member, a plurality of generally flat disc-like articles housed in face-to-face relationship in a coiled tubular member, said coiled member being supported by said support member, a cover completely covering said coiled member, and said cover being defined by a generally annular housing which is substantially inverted U-shaped in configuration.

13. The coiled article package as defined in claim 12 wherein said cover is defined by a generally annular bight portion and a pair of depending peripheral skirt portions in generally spaced parallel relationship to each other.

14. A coiled article package comprising a support member, an upstanding member secured to said support member, a plurality of generally flat disc-like articles housed in face-to-face relationship in a coiled tubular member, and said coiled tubular member being supported by said support member in external telescopic relationship to said upstanding member.

15. The coiled article package as defined in claim 14 including means for supporting said support member in spaced relationship to a supporting surface.

16. The coiled article package as defined in claim 15 wherein said last-mentioned means is an extension of said upstanding member projecting beneath said support member.

17. The coiled article package as defined in claim 15 wherein said last-mentioned means is a generally annular wall portion, said support member being seated upon said annular wall portion, and means for supporting the annular wall portion in spaced relationship to a supporting surface.

18. The coiled article package as defined in claim 17 wherein a said annular wall portion terminates at an upstanding peripheral wall portion, and said upstanding peripheral wall portion is in external telescopic relationship to said coiled tubular member.

19. The coiled article package as defined in claim 14 including a tubular housing in exterior telescopic relationship to said upstanding member, and a cover overlying said coiled tubular member.

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