

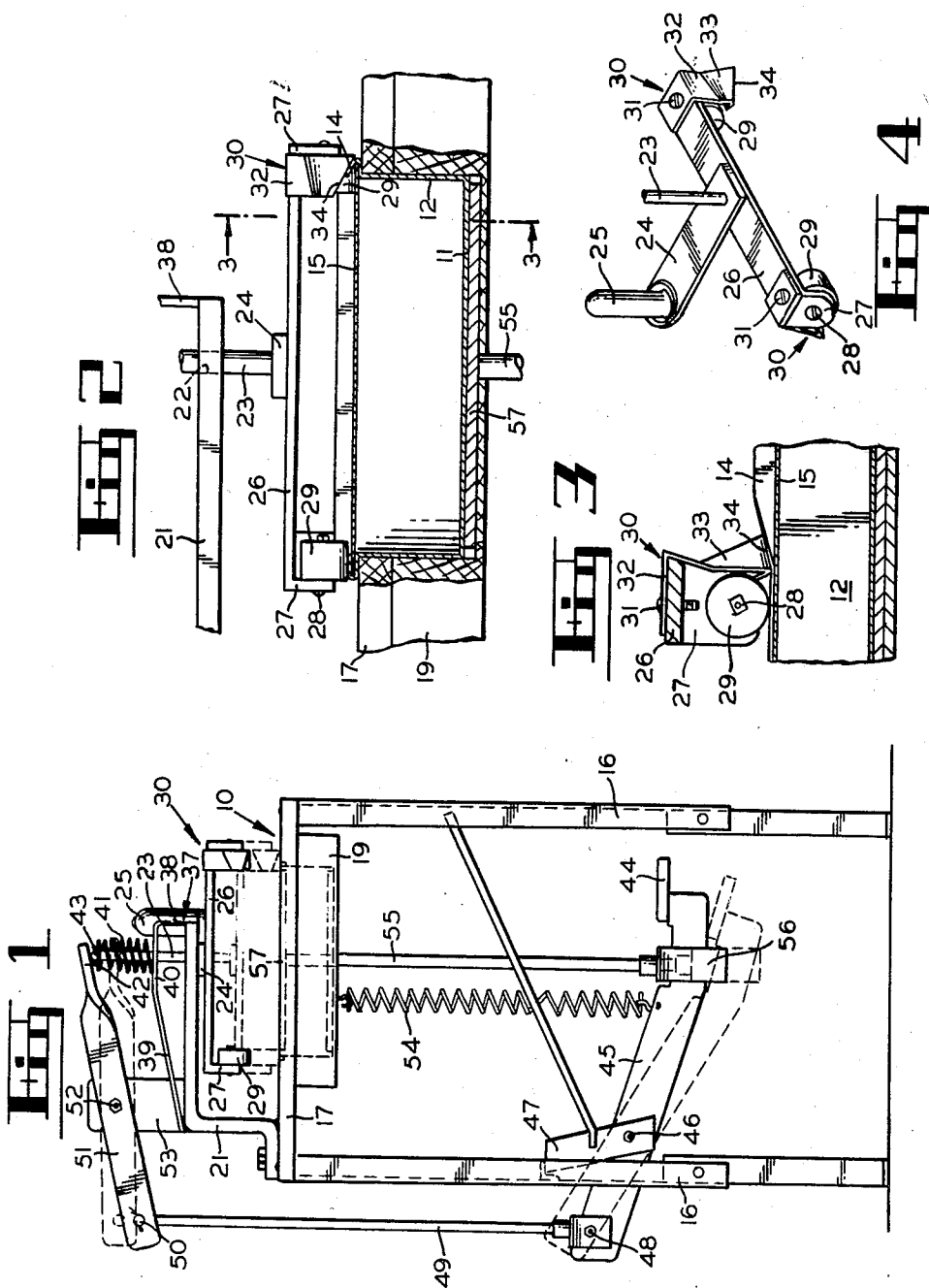
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METALLIC FOIL PACKAGING MACHINE

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METALLIC FOIL PACKAGING MACHINE

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The present invention relates to a metallic foil packaging machine and more particularly to a machine for folding the free edge of a metallic foil package to secure a cover or the like therebeneath.

In the packaging of foods and the like, metallic foil containers have recently come into use. These containers are particularly well adapted for baked goods and the like, since the container itself can be used to reheat the food, as well as forming an attractive package therefor. However, the popularity of this type of container has posed a problem for the small food producer or baker, since the only packaging machinery heretofore provided which is adaptable to the use of such containers is of relatively large size and is quite expensive. The present invention provides an extremely simple, inexpensive machine which may be utilized for the packing of bakery goods or the like within metallic foil containers. Thus, the use of a machine of the present invention makes it economically feasible for the relatively small producer of food stuffs to utilize the metallic foil packaging techniques which have proved so successful for the larger establishments of this type.

For use with the present invention, foil containers are provided in the form of shallow, open-topped, circular pans having out-turned annular ledge surfaces terminating in an upturned annular rim. To close the open container, a circular lid or top is utilized, the top being positioned on the out-turned ledge and secured thereto by deforming the rim downwardly and inwardly to smoothly overlies the ledge of the lid. The lid is thus locked to the container by the positioning of the annular edge of the lid between the ledge and the in-turned container rim.

The machine of the present invention comprises essentially a supporting surface conforming to the contour and size of the annular ledge of the container and adapted to receive the ledge thereagainst to support the same. The machine is also provided with a rotating head which carries means for contacting the upstanding container rim and for deforming the rim inwardly and downwardly to lie smoothly against the top which has been previously positioned upon the container ledge. This means for deforming the rim preferably comprises a deforming element having an inclined abutting edge adapted to contain the rim and to initially deform the same inwardly toward the center of the container, and a rotatable element positioned immediately adjacent the edge and adapted to further deform the rim into intimate contact with the cover. The rotatable element has an axis which is parallel to the plane of the container top, while the initial contacting edge is inclined with respect to this plane, so that the rim is initially deformed smoothly by the edge into the path of the rotating element.

It is, therefore, an important object of the present invention to provide an improved, simple, and inexpensive metallic foil packaging machine.

It is another object of the present invention to provide a packaging machine particularly adapted for use with metallic foil packages and having means for deforming

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an upstanding package rim into intimate retaining contact with a package top.

A further important object of this invention is the provision of an improved metallic foil packaging machine particularly adapted for use with packages having an outwardly directed annular ledge and an upstanding terminal rim, including a planar supporting surface adapted to abut the underside of the container ledge, an inclined deforming surface for initially contacting the container rim, and a rotatable element adjacent the inclined surface and moveable about an axis parallel to the container ledge for deforming the rim inwardly to overlies the edge so that the container top will be locked between the ledge and the rim.

Other and further objects of the present invention will be apparent from the disclosures in the specification and the accompanying drawings.

On the drawings:

Figure 1 is a side elevational view of a machine of the present invention, the machine being shown in its normal or non-operating condition in solid lines and in its operated condition in dotted outline;

Figure 2 is an enlarged, fragmentary view, partly in section, further illustrating the operation of a machine of the present invention;

Figure 3 is an enlarged, fragmentary sectional view taken along the plane 3—3 of Figure 2; and

Figure 4 is an enlarged, prospective view of that portion of the machine shown in Figure 2 and further illustrating the operation of the machine.

As shown on the drawings:

In Figure 1, reference numeral 10 refers generally to a metallic foil packaging machine of the present invention particularly adapted for use with a package best shown in Figure 2. The package comprises a generally cylindrical, shallow, open-topped pan or the like having a bottom 11 and a circular upstanding side wall 12 having an annular out-turned ledge 13 adjacent the open top thereof and terminating in an upstanding rim 14. The pan is preferably formed of metallic foil formed of a suitable metallic material, such as aluminum, magnesium or the like. The pan is preferably closed by a generally circular top 15 formed of a suitable material, such as cardboard or the like, and which may be provided with a transparent center portion, if desired. The top 15 is of a size to overlies the side walls 12 of the pan, the top normally being in contact with the annular ledge 13 and fitting within the circumference defined by the annular rim 14.

The machine 10, as illustrated in Figure 1 in a preferred embodiment thereof, is provided with a plurality of upstanding legs 16 joined to a supporting surface or base 17 extending between the legs 16 and provided with a central cylindrical recess 18 of a size and contour to accommodate the entry of the pan 12 therein with the ledge 13 overlying the surface 17, and in contact therewith. As shown on the drawings, the recess 18 may be provided by a dropped central portion 19 of the surface 17, although it will be appreciated that the top may be built up to provide the recess 18. In any event, the pan ledge 13 snugly abuts adjacent annular surface 20 formed on the machine base 17.

The machine base 17 supports an upstanding arm 21 having an in-turned flange 22 which overlies the stand recess 18 and which has a central opening 22 therein. Preferably, the opening 22 is concentric with the recess 18 and is vertically spaced thereabove. The recess 22 is adapted to receive therethru an actuating rod 23 guided by the recess 22 for vertical reciprocatory motion and carrying beneath the flange 21 a crank arm 24 having at its outer end an upstanding handle 25. The crank arm 24 is secured to the rod 23 on its upper surface

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and on its lower surface carries a cross head 26 ejecting laterally in a plane substantially normal to that of the crank arm 24. The cross head 26 is provided with terminal down-turned ears 27 at each end thereof. These ears 27 are apertured to receive therethrough bolts or the like 28 forming axles for rotatable rollers 29. The rollers 29 are rotatable about the axes defined by the bolts 28, the rotatable axes of the rollers 29 being parallel to the plane of the machine base 17 and also parallel to the plane of the container ledges 13 when the container is positioned within the recess 18 as heretofore described.

The crosshead 26 also carries adjacent its outer extremities a pair of deforming elements 30, which might be termed "plows." These plows 30 are secured to the crosshead 26 by suitable means, such as screws 31, and are provided with a first or upper surface 32 lying snugly against the crosshead 26 and having depending portions 32 hanging down adjacent the rollers 29 and in advance thereof in the normal direction of rotation of the crosshead 26. The depending portions 32 of the plows have their lower portions 33 deformed outwardly ahead of the rotatable elements 29 and these portions 33 are provided with terminal or deforming surfaces 34 which are inclined generally inwardly and upwardly of the container, as best shown in Figure 2. To define a smooth surface, the terminal lips 34 are preferably provided by turning back the sheet metal of which the plows are formed, so that the under surfaces 35 of the plows are directed toward the rollers 29 as best seen in Figure 4.

To aid in guiding the actuating rod 23, the flange 22 is provided with an upstanding additional element 37. This element 37 includes a vertical leg 38, a downwardly and rearwardly inclined leg 39, and an upper horizontal guide surface 40 which is centrally apertured to slidably receive the rod 29 therethru. The surface 40 also serves to bottom a compression spring 41 which is interposed between the surface 40 and a washer 42 carried by the rod and secured thereto by suitable means, as by a cotter key 43.

The rod 23 may be reciprocated vertically by means of a treadle 44 formed at the end of a lever 45 pivoted, as at 46, to a brace 47 carried by one or more of the legs 16. The lever 45 carries at its free or rear end a pivot 48 joined to the lower end of an actuating link 49. The link 49 extends vertically from the pivot point 48 and in turn is pivotally joined at its upper end, as at 50, to the rear end of an additional lever 51 centrally pivoted, as at 52, to an upstanding arm 53 carried by the flange 22. The free end of the lever 51 generally overlies the rod 23. The free end 52 of this lever may be twisted to provide an abutment surface adapted to contact the upper end of the actuating rod 23. It will be seen that depression of the treadle 44 to its dotted position of Figure 1 will depress the rod 23 against the action of the spring 41 to lower the crosshead toward the base 17 of the machine. The rod may be lowered sufficiently to bring the plows 30 and the rollers 29 into contact with the upstanding rim 14 of the container 12. The further depression of the pedal will cause the roller to lie snugly against the upstanding rim when the same has been deformed to overlie the outer marginal edges of the cover 15, as shown in Figures 2, 3, and 4. The lever 45 is urged to its upper position by a tension spring 54 joined to a medial portion of the lever 45 and to the under surface of the base 17. The lever also carries an upstanding rod 55 having a clevis 56 at its lower end straddling the lever 45 and the rod 55 carries at its upper end a generally circular plate 57 adapted to receive the bottom 11 of the container 12 thereagainst. Depression of the treadle 44 will not only push the rod 23 down, but will allow the rod 55 to drop, so that the plate 57 will assume its lowered position as shown in Figure 2. Release of the treadle will allow the plate

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57 to travel upwardly under the tension of the spring 54 to eject the completed container from the machine.

The operation of the machine shown in the drawings will be readily appreciated. To form the completed package, the open-topped cylindrical container 12 is placed upon the raised plate 57, which normally occupies its upper dotted position shown in Figure 1, at which the plate is coplanar with the base 17 of the machine. Preferably, before the container has been placed upon the plate, the cardboard or similar top 15 has been positioned upon the ledge 13 and opposing portions of the rim 14 have been deformed downwardly to lie parallel to the ledge 13 to retain the top in this position and to condition the rim 14 for clinching movement.

Next, the treadle 44 is depressed. This movement of the treadle will allow the plate 57 to assume its position as illustrated in Figure 2 with the container positioned within the recess 18 and with the ledge 13 snugly abutting the corresponding surface 20 of the machine base 17. This same movement of the treadle will cause depression of the crosshead 26 by actuation of the rod 23 against the compressive force of the spring 41. The crosshead will be lowered until the rollers 29 contact the previously deformed portion of the rim 14. The crosshead 26 is now rotated by arcuate movement of the crosshead lever 24, as by means of the handle 25.

Movement of the crosshead through an angle of 180° will completely deform the rim 14 downwardly to smoothly and snugly overlie the marginal portions of the cover 15. This action is accomplished by the co-operating action of the plows 30 and the rollers 29. As the crosshead is rotated, the inclined surface 34 of the plows first will contact the rim and move the same inwardly until it lies at an acute angle with respect to the ledge 13. This position of the rim is shown in Figure 2 of the drawings. After the rim has been inwardly deformed initially by the plows, the rollers will next contact the rim and will deform the same snugly into contact with the top to clinch the top between the U-shaped integral and continuous surfaces formed by the ledge 13 and the inwardly deformed rim 14. It will be noted that this in-folding movement of the rim 14 occurs in two distinct steps, and that the rim is first partially deformed inwardly by the inclined plow surfaces 34 and finally caused to lie flat against the top by the rotating rollers. Thus, the folding movement occurs as a result of first contacting the rim with the moving, but non-rotatable, inclined surface 34 of the plows, followed by a final closing movement by virtue of the contacting of the rim with the rotatable rollers 29.

After the crosshead has been rotated sufficiently to snugly deform the rim 14 into smooth continuous contact with the upper surface of the top 15, the foot treadle 44 is released. The tension spring 44 will return the plate 57 to its upper position of Figure 1, while at the same time the compression spring 41 will return the crosshead to its raised position of Figure 1. Thus, the crosshead is moved out of the way of the container, and the container is ejected from the recess 18. The completed container, together with the contents thereof, may now be removed from the machine.

It would be appreciated that the present invention thus provides an extremely simple, inexpensive, easily usable machine for providing a metallic foil package in which a top is securely clinched between a laterally extended, double thickness flange formed integrally with the metallic package itself. The advantages of the present machine, its simplicity of operation, and the effective closure of the package by utilization of the machine will be readily understood.

It will be understood that the invention is not to be limited to the exact construction shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention, as defined in the appended claims.

What is claimed is:

1. A packaging machine for clinching a cover upon a container having a laterally directed annular ledge receiving the cover and an upstanding integral rim encompassing the cover comprising means providing a supporting surface upon which said ledge is supportable, a rotatable crosshead positioned above said supporting surface for rotation about an axis concentric with said annular ledge, a roller carried by said crosshead and adapted for rollable contact with said rim, and a plow also carried by said crosshead and positioned adjacent said roller, said plow having an inclined surface contactable with said rim in advance of said roller to deform the same laterally from its upstanding position so that the roller will subsequently flatten the rim snugly against the cover to secure the same between the ledge and the flattened rim.

2. In a machine for securing a circular cover to a container having an annular ledge bearing the cover and a rim encompassing the cover, a fixed base having a surface adapted to receive the container ledge thereagainst, supporting means on said base superimposed over said surface, a crosshead carried by said supporting means for vertical and arcuate movement and bearing a plurality of rollers spaced about the axis of arcuate crosshead movement, said rollers being vertically aligned with the container rim, means on said crosshead providing deforming surfaces inclined both vertically and radially with respect to said axis of crosshead movement, said deforming surfaces being positioned in advance of said rollers in the direction of rotation of said crosshead, means for vertically

moving said crosshead to bring said deforming surfaces and said rollers into contact with said rim, and means on said crosshead for rotating the same about an axis concentric with said annular ledge to sequentially subject said rim to the deforming action of said deforming surfaces and said rollers.

3. In a packaging machine having a central cylindrical recess adapted to receive a foil package therein and an annular surface adjacent the recess to underlie a corresponding ledge on the package, the package ledge having a terminal upstanding rim thereabout, means for deforming the package rim into intimate contact with a cover on the ledge, comprising a roller rotatable about an axis parallel to the plane of the package ledge, a plow positioned immediately adjacent the roller and having a fixed surface inclined upwardly and inwardly toward the center of the recess, means supporting said roller and said plow for vertical movement into contact with said rim and means rotatable about an axis concentric with the recess for moving the roller and the plow about the package ledge to deform the package rim to overlie the cover by sequentially subjecting said rim to the folding action of said plow and said roller.

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