

April 13, 1926.

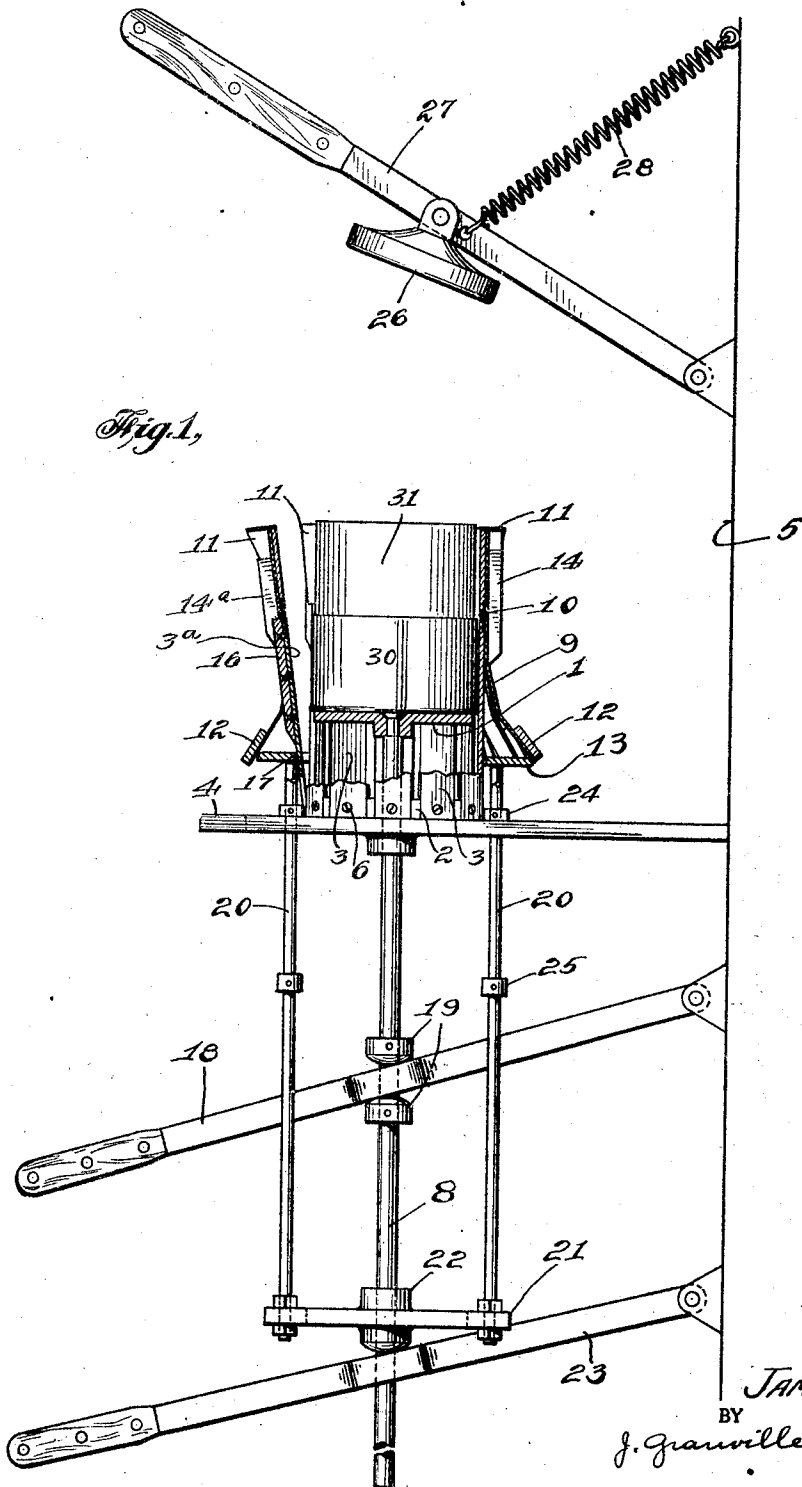
J. C. THOM

1,580,867

MACHINE FOR PACKAGING TOBACCO AND THE LIKE

Filed Jan. 2, 1925

3 Sheets-Sheet 1



INVENTOR

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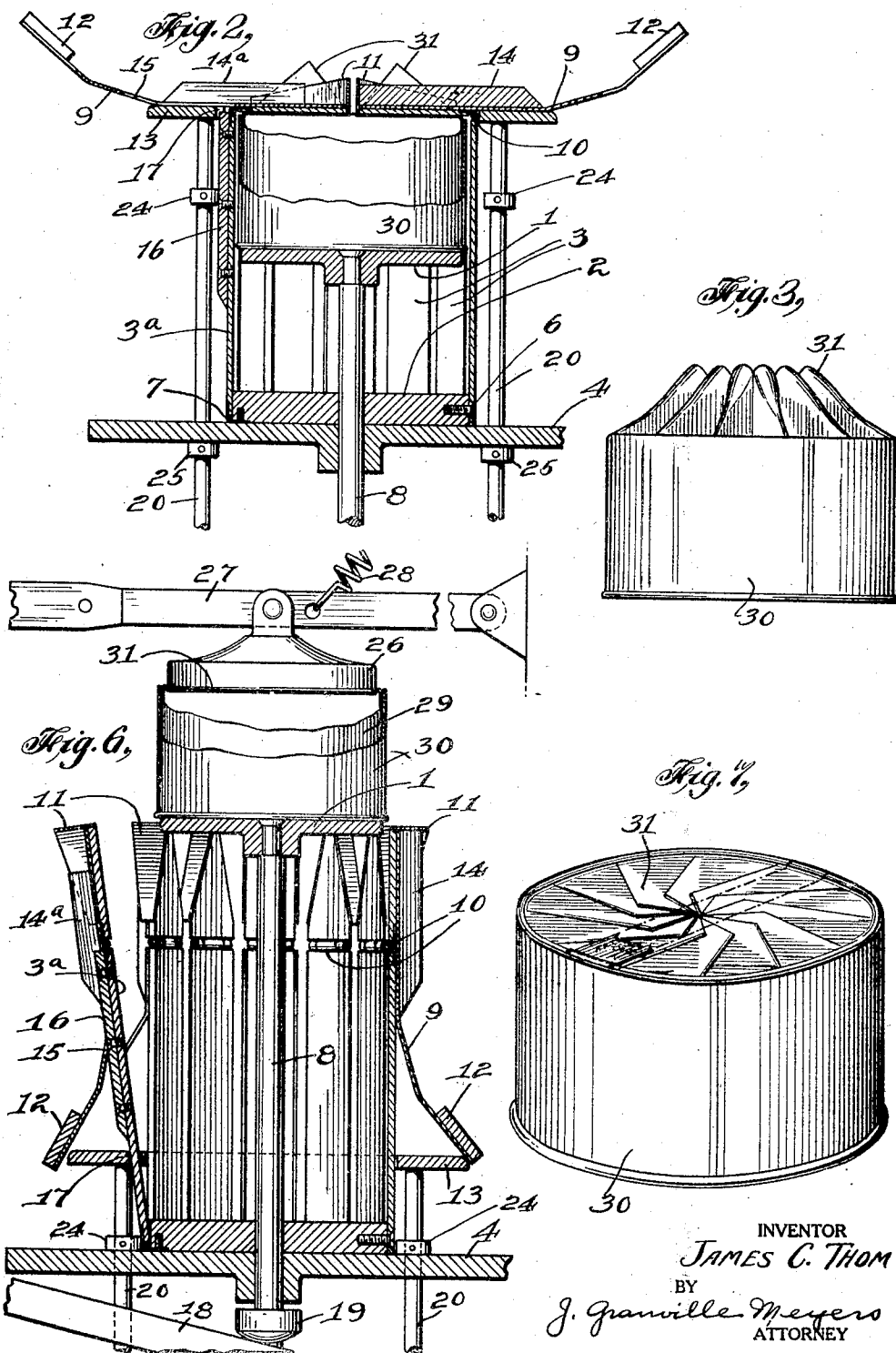
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Fig. 4,

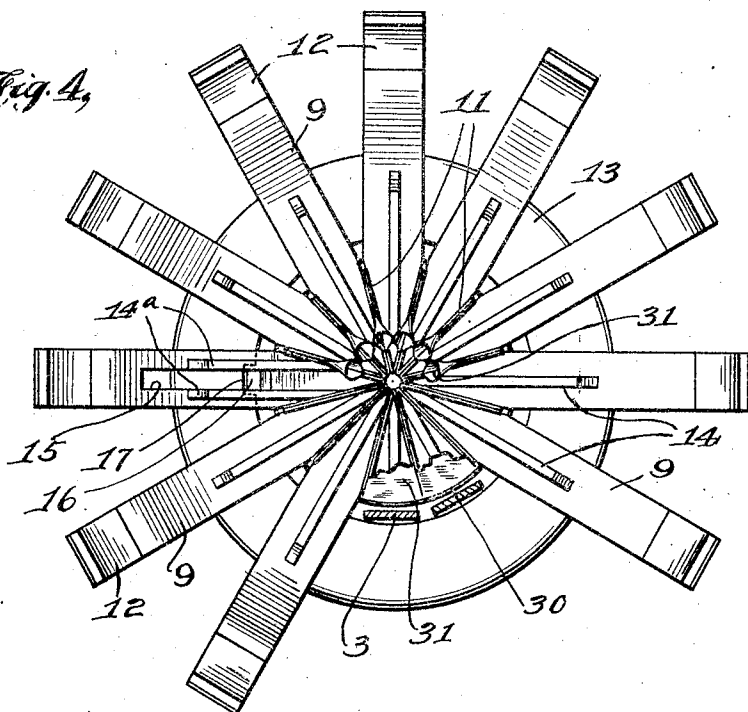
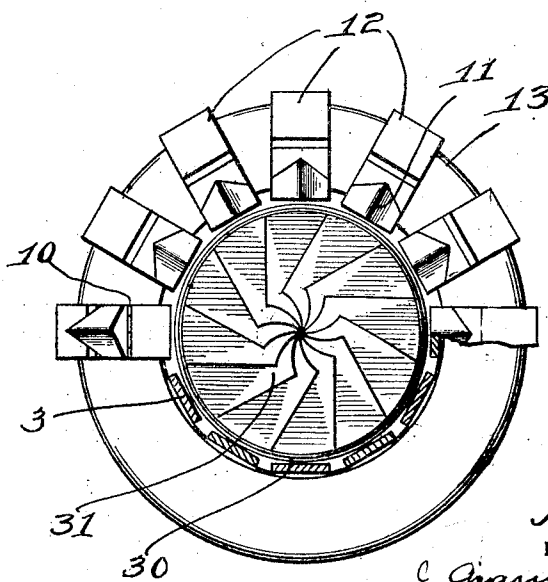


Fig. 5,



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UNITED STATES PATENT OFFICE.

JAMES C. THOM, OF CHICAGO, ILLINOIS, ASSIGNOR TO COMBINATION MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

MACHINE FOR PACKAGING TOBACCO AND THE LIKE.

Application filed January 2, 1925. Serial No. 130.

To all whom it may concern:

Be it known that I, JAMES C. THOM, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Packaging Tobacco and the like, of which the following is a specification.

This invention is an improvement in wrapping machines; and more specifically in machines for closing the ends of tubular structures.

In my copending application, Ser. No. 753,136, filed Dec. 1, 1924, a method of packaging is described and claimed; wherein the end or top of the inner wrapper of a package of tobacco, candy or the like, is closed in such manner that it may be easily opened and refolded into its original formation.

This result is obtained by forming in the end of the wrapper, which is a tubular structure, a number of pleats, each right triangular in contour with its hypotenuse radial to the axis of the package, and connected by sector shaped plane portions in a common plane and in the plane of the closed end; the pleats diverging at equal angles and pressed down into the plane of the closed end, so that each laps upon the preceding pleat.

The pleats are most easily formed by creasing the paper or other material on lines radial to the axis of the package, while doubling the material in the alternate spaces between the crease lines into the right triangular pleats above mentioned. The pleats are afterwards folded down upon the top by a pressing means, which may if desired have a slight angular movement in the direction in which it is desired the pleats will lie.

An object of the present invention is the provision of a machine for mechanically performing the several operations in sequence, thereby to turn out a finished package at each operation.

Another object is the provision of a machine wherein the pleating is done by a selected number of folding fingers simultaneously moved from a position parallel with the axis of the package to a position perpendicular thereto.

Another object is the provision of mechanism in connection with the folding fingers

for simultaneously flattening or ironing the pleats as they are formed by the folding fingers.

Another object is to provide a support for the package so arranged as to prevent damage to the revenue stamp during the folding, and to assist the proper placing thereof after folding.

With these and other objects in view, the invention consists in the construction and novel combination of parts fully described hereinafter, illustrated in the accompanying drawings, and pointed out in the claims appended hereto, it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit of the invention.

In the drawings:

Fig. 1 is a side elevation of the improved machine, with parts in section.

Fig. 2 is a vertical section through the support for the package with the folding fingers in operative position.

Fig. 3 is a side elevation of the package with the top partially folded.

Fig. 4 is a plan view of the support and folding fingers with parts in section.

Fig. 5 is a similar view with the pleats turned down.

Fig. 6 is a side elevation of the support with the parts in compressing position, and with a part in section.

Fig. 7 is a perspective view of the completed package.

In the present embodiment of the invention, a suitable support is provided for the package, the said support including in the present instance a plunger 1 upon which the package rests. This plunger is circular and of a diameter slightly less than that of the package, and it has vertical movement within a cage composed of a bottom plate or head 2 and staves 3.

The bottom plate 2 rests upon a suitable table 4, which extends laterally from a wall or other support, indicated at 5, and the staves 3 are secured to the edge of the plate 2, in any suitable manner, as for instance by screws 6, the edge of the plate being notched or recessed to receive the staves,

which are spaced apart slightly from each other, as clearly shown.

One of the staves indicated at 3^a is hinged to the plate 2 as indicated at 7 instead of being rigidly connected therewith, so that the said stave may swing away from the axis of the cage at its upper end. The plunger 1 has connected therewith a rod 8, which extends through registering openings in the plate 2 and table 4, and is engaged by operating mechanism to be described, for moving the same vertically.

A folding finger 9 is supported at the top of each stave, the fingers being hinged to the staves as indicated at 10. These fingers are arranged to swing from the position of Fig. 6 to that of Fig. 2, and they are sector shaped so that when in such last named position they will cover substantially the upper end of the cage.

That is the upper or inner ends of the fingers are beveled, so that each will fit between two adjacent fingers when in horizontal position, with a slight space between adjacent beveled walls, sufficient to receive a double thickness of paper. An upstanding fin or wing 11 is provided at the beveled edges of each finger, the wings being substantially V-shaped as shown, and decreasing in height from the point of the finger outward. The adjacent wings of adjacent fingers cooperate to form between them the pleats to be later described.

Each finger has its lower or outer end bent outward slightly as shown in Figs. 1 and 6, and the said end of each finger is counterweighted as shown at 12, so that normally the fingers occupy the position of Figs. 1 and 6. They are moved inwardly by means of a ring 13 which encircles the cage, and is moved vertically by mechanism to be described. The outward bend or angular portion of each finger is sufficient to insure that when the ring 13 moves upward, it will engage the inner face of the finger, thereby to swing the lower end outward.

Each of the fingers 9 is reinforced by a longitudinal rib 14 on its outer face and near its upper end, the ribs extending from the points of the fingers about half their length. The finger connected to the stave 3^a has two ribs 14^a, which are arranged at opposite sides of a slot 15 extending longitudinally of the finger, and the stave to which the finger is connected has a cam plate 16 on its outer face which moves in a radial notch 17 in the ring 13.

The plunger 8 is moved by means of a hand lever 18 pivoted to the fixed support 5, and having a loop or slot through which the plunger rod extends. Stop collars 19 are arranged on the rod above and below the lever, so that the rod moves with the lever. A pair of rods 20 is connected with the ring 13, and the rods extend through openings

in the table 4, to a connection with a yoke 21 at their lower ends. The rods are adjustably connected with the yoke, which has a bearing or hub 22 at its center, through which the rod 8 slides.

A hand lever 23 is pivoted to the fixed support 5 below the yoke and the lever has a loop or slot through which the rod passes. The lever engages the lower end of the hub, which may be moved vertically by means of the lever to move the ring 13. Stop collars 24 and 25 are secured on the rods 20 above and below the table 4, to limit the movement of the ring.

A pressing plunger 26 is mounted above the package support. The plunger 26 is pivoted to a hand lever 27 which in turn is pivoted to the fixed support 5, and a spring 28 is provided for holding the lever and the plunger elevated in the position shown in Fig. 1.

In operation the package to be wrapped indicated at 29, of cylindrical form, and usually held in a can 30 or other cylindrical container of sheet metal or the like, is set upon the plunger, within the cage, as clearly shown in Fig. 1. The plunger 1 is elevated so that the open end of the tube which is the inner wrapper of the package extends above the cage. That is the package should be in such a position that the top of the container 30 should be level or nearly so with the top of the cage.

The revenue stamp which is arranged to enclose the package, is placed in the container 30 before the package is inserted. The end of the stamp extends above the top of the container, and after the wrapping is complete, it is secured diametrically of the top of the package. In order to prevent injury to the end of the stamp during the folding, and to prevent folding thereof with the top of the tube the end of the stamp is bent down outside of the can 30, and the can is so placed in the cage that the depending end of the stamp registers with the stave 3^a. This stave is shown in Figs. 1 and 6, swings outward when the ring 13 is down, because of the excess weight at its upper end, and the notch 17 of the ring permits a considerable outward swing.

When the package has been properly positioned, the ring 13 is lifted by means of the hand lever 23. As the ring moves upward, the plate 16 engages the notch, and the upper end of the stave 3^a is swung into vertical position. Further upward movement of the ring swings the lower ends of the folding fingers outward, and they are moved from the position of Fig. 1 to that of Fig. 2, forming in the open end of the tube or bag a number of radial pleats 31, as shown in Figs. 2, 3 and 4.

Since the folding fingers are similar, the pleats are also similar and similarly ar-

ranged diverging from the axis of the package at equal angles. In effect the folding fingers form in the open top of the tube or bag a number of pairs of radial crease lines.

5 With the members of each pair parallel, the material between the members forms the pleat.

The fins or wings 11 cooperate to flatten or iron the pleats, and when the ring 13 is lowered and the fingers swing outward, the pleats are of the shape shown in Fig. 3.

The pleats may be flattened by imparting a slight angular movement to the package when the parts are in the position of Fig. 2, but preferably the plunger 26 is used. This plunger not only flattens the pleats and causes them to lie in the same direction, each lapping upon the succeeding, but it also slightly depresses the folded top as shown in Figs. 6 and 7, accentuating the fold line, which is the hinge between the top and the side wall of the wrapper.

In order to use the plunger 26 the package is lifted as shown in Fig. 6 to the level of the upper ends of the folding fingers, by means of the plunger 1. The revenue stamp may now be arranged on the top of the package, and the cover of the can placed. The dropping of the plunger 1 and the release of the lever 27 restores the parts to their normal position.

It will be noticed referring to Figs. 3 and 4 that the folding fingers do not entirely flatten the right triangular fold, a portion of the folds at the right angle, and opposite the hypotenuse remaining unflattened. These portions of the folds are conical, and they contact as clearly shown in the said figures. When the folds are brought into contact with the plunger, because of this contact they all fold in one direction. The folding and flattening may be aided by imparting a slight angular movement to the package as above mentioned, or to the plunger.

I claim:

1. In a machine of the class described, means to fold the open end of a tube of paper or the like into similar similarly arranged radial pleats, including a set of folding fingers, pivoted in a common plane about a common center to swing toward the center into the common plane, the engaging faces of the fingers plane, and the adjacent side edges of the adjacent fingers plane and parallel.

2. In a machine of the class described, means to fold the open end of a tube of paper or the like into similar similarly arranged radial pleats, including a set of folding fingers, pivoted in a common plane about a common center to swing toward the center into the common plane, and normally counter-weighted to a position substantially perpendicular to the common plane, the en-

gaging faces of the fingers plane, and the adjacent side edges of the adjacent fingers plane and parallel.

3. In a machine of the class described, means to fold the open end of a tube of paper or the like into similar, similarly arranged radial pleats, said means including folding fingers mounted to swing from a position substantially parallel with the axis of the tube into substantially the same plane, and a tubular cage to enclose the paper tube, the fingers pivoted to the cage.

4. In a machine of the class described, means to fold the open end of a tube of paper or the like into similar, similarly arranged radial pleats, said means including folding fingers mounted to swing from a position substantially parallel with the axis of the tube into substantially the same plane, and a tubular cage to enclose the paper tube, the fingers pivoted to the cage, the cage including vertical staves spaced apart angularly, one of said staves pivoted at the bottom of the cage to swing outwardly at its top with the folding finger pivoted thereto.

5. In a machine of the class described, means to fold the open end of a tube of paper or the like into similar, similarly arranged radial pleats, said means including folding fingers mounted to swing from a position substantially parallel with the axis of the tube into substantially the same plane, and a tubular cage to enclose the paper tube, the fingers pivoted to the cage, the cage including vertical staves spaced apart angularly, one of said staves pivoted at the bottom of the cage to swing outwardly at its top with the folding finger pivoted thereto, and means for first moving the said stave to inward position, and for afterwards simultaneously swinging the folding fingers into folding position.

6. In a machine of the class described, means to fold the open end of a tube of paper or the like into similar, similarly arranged radial pleats, said means including folding fingers mounted to swing from a position substantially parallel with the axis of the tube into substantially the same plane, and a tubular cage to enclose the paper tube, the fingers pivoted to the cage, a plunger in the cage for supporting the tube, and means to move the plunger.

7. In a machine of the class described, a holder for a substantially cylindrical package of tobacco or the like, including a cage, folding fingers to fold the open end of the package hinged to the top of the cage, a portion of the cage carrying a folding finger mounted to swing and normally urged to swing out of alinement with the remainder of the cage for the purpose specified, means for simultaneously operating the folding fingers, and means whereby said means will swing the said portion of the cage into aline-

ment prior to the operation of the folding fingers.

8. In a machine of the class described, a substantially cylindrical cage, composed of vertical staves, folding fingers hinged to the tops of the staves, and means for simultaneously moving the fingers to horizontal position thereby to fold the top of a tube within the cage, one of the staves hinged to the cage to swing outward at the top thereof and moved to normal vertical position by the folding finger operating means.

9. In a machine of the class described, a substantially cylindrical cage, composed of vertical staves, folding fingers hinged to the tops of the staves, and means for simultaneously moving the fingers to horizontal position thereby to fold the top of a tube within the cage, and a supporting plunger for the tube to be folded movable vertically in the cage.

10. In a machine of the class described, a substantially cylindrical cage, composed of vertical staves, folding fingers hinged to the tops of the staves, means for simultaneously moving the fingers to horizontal position thereby to fold the top of a tube within the cage, a supporting plunger for the tube to be folded movable vertically in the cage, and an ironing plunger supported for movement toward and from the top of the cage.

11. In a machine of the class described, a cage for enclosing a substantially cylindrical wrapper having its upper end open, folding fingers hinged to the top of the cage to fold the end of the wrapper and counter-weighted to normally swing into inoperative position, and a common means for simultaneously moving all of the fingers into folding position.

12. In a machine of the class described, a cage for enclosing a substantially cylindrical wrapper having its upper end open, folding fingers hinged to the top of the cage to fold the end of the wrapper and counter-weighted to normally swing into inoperative position, and a common means for simultaneously moving all of the fingers into folding position, the operative portions of said fingers bevelled to fit one alongside the other.

13. In a machine of the class described, a cage for enclosing a substantially cylindrical wrapper having its upper end open, folding fingers hinged to the top of the cage to fold the end of the wrapper and counter-weighted to normally swing into inoperative position, and a common means for simultaneously moving all of the fingers into folding position, the operative portions

of said fingers bevelled to fit one alongside the other, and each having vertical pressing vanes at the bevelled edges.

14. In a machine of the class described, a cage for enclosing a substantially cylindrical wrapper having its upper end open, folding fingers hinged to the top of the cage to fold the end of the wrapper and counter-weighted to normally swing into inoperative position, and a common means for simultaneously moving all of the fingers into folding position, a portion of the wall of the cage hinged and counter-weighted to normally swing outward at its upper end and carrying one of the folding fingers, and means whereby the initial movement of the finger operating means will swing said portion inward.

15. In a machine of the class described, means to fold the open end of a tubular bag, including a plurality of folding fingers, hinged in a circle with the axis of the bag as a center to swing from a plane transverse to the bag axis to a position substantially parallel therewith, the fingers having plane sector shaped paper engaging faces.

16. In a machine of the class described, means to fold the open end of a tubular bag, including a plurality of folding fingers, hinged in a circle with the axis of the bag as a center to swing from a plane transverse to the bag axis to a position substantially parallel therewith, said fingers counter-weighted to normally occupy said last named position.

17. In a machine of the class described, means to fold the open end of a tubular bag, including a plurality of folding fingers, hinged in a circle with the axis of the bag as a center to swing from a plane transverse to the bag axis to a position substantially parallel therewith, said fingers counter-weighted to normally occupy said last named position, and means to simultaneously move the said fingers to the first named position.

18. In a machine of the class described, means to fold the open end of a tubular bag, including a plurality of folding fingers, a circular support for the fingers, adapted to encircle the bag, the fingers hinged to the support to swing from a plane transverse to the axis of the support, to substantially parallel therewith, said fingers of isosceles triangular shape, and having the hinge connections at the bases thereof.

Signed at Chicago in the county of Cook and State of Illinois this 27th day of December, A. D. 1924.

JAMES C. THOM.