Feb. 27, 1968 M. C. BRIGMAN 3,370,397

HEAD LETTUCE PACKAGING MACHINE

Filed April 28, 1965 2 Sheets-Sheet 1

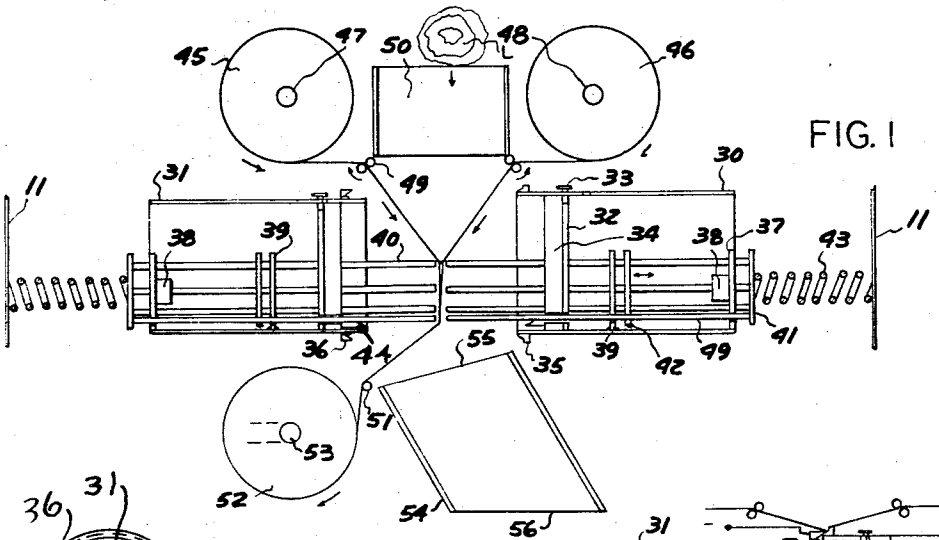


FIG. 1

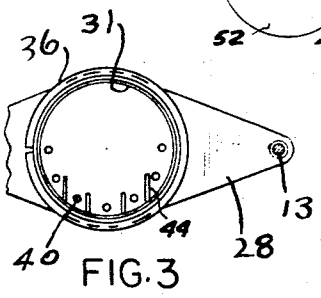


FIG. 3

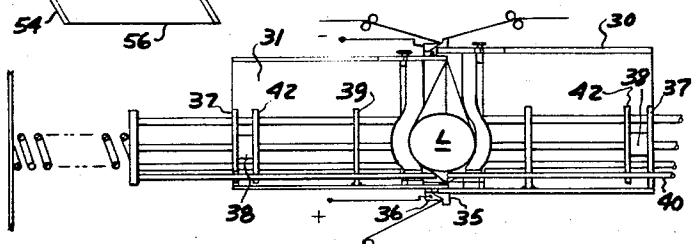


FIG. 2

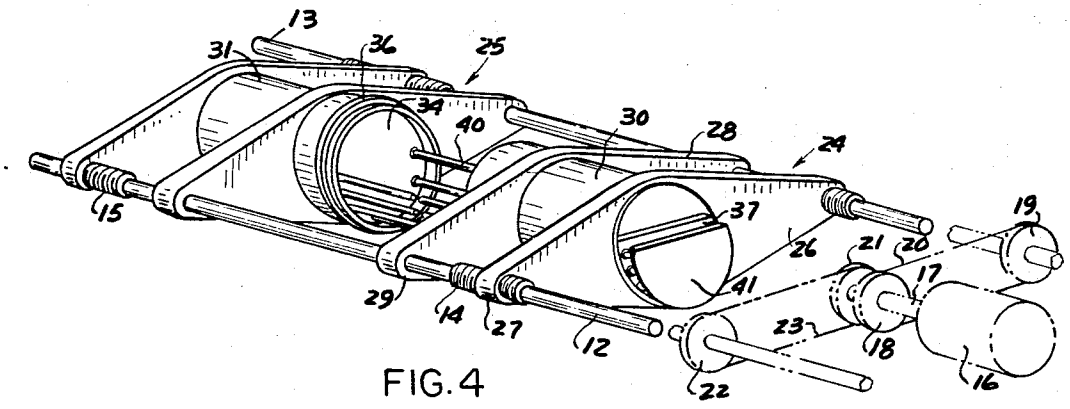


FIG. 4

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FIG. 7

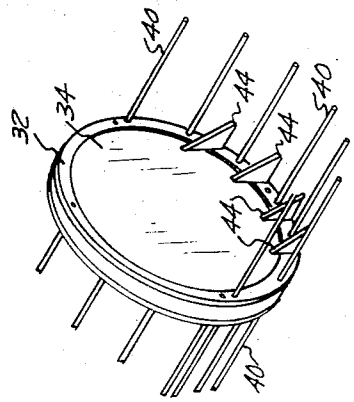


FIG. 8

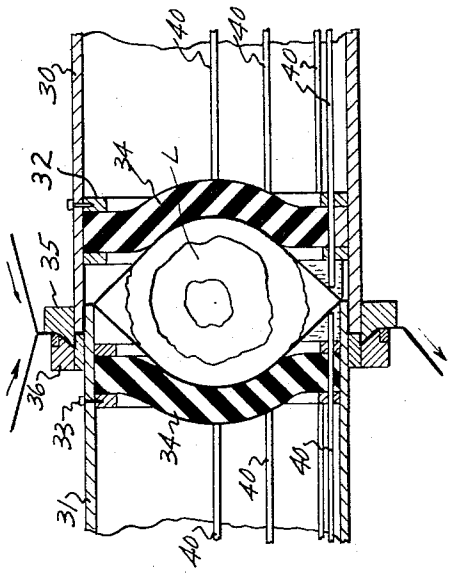


FIG. 5

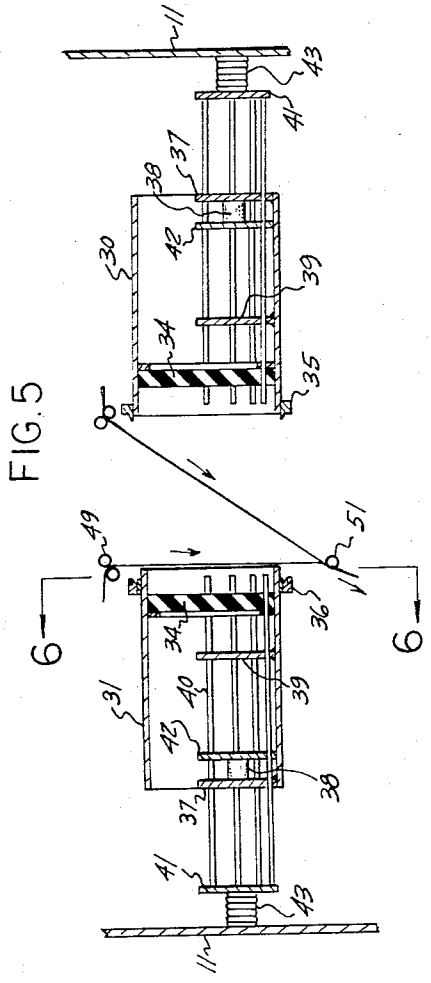
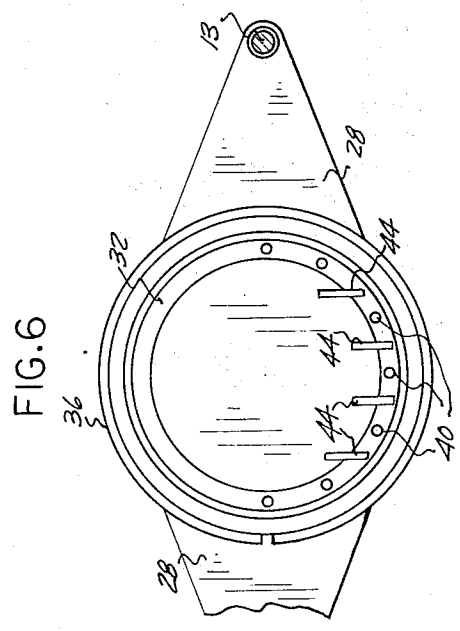


FIG. 6



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HEAD LETTUCE PACKAGING MACHINE

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7 Claims. (Cl. 53—180)

ABSTRACT OF THE DISCLOSURE

A head lettuce packaging machine by which a head of lettuce is enclosed within and between a pair of opposed strips of plastic and the strips heat sealed throughout 360° to provide a substantially air tight package.

Brief description

Heretofore, in grocery stores and supermarkets it has been the practice after cleaning up a head of lettuce of manually projecting the same into a polyethylene or similar plastic bag, which bag may be oversized to permit twisting and turning for closing thereof or which may merely be left open so that portions of the lettuce are exposed.

It is the primary object of the present invention to provide a novel machine by which head lettuce may be automatically packaged into and sealed within polyethylene or other plastic bags to minimize handling and to expedite packaging of heads of lettuce with least damage thereto.

It is another object of this invention to provide a novel method of packaging lettuce by which a head of prepared lettuce is dropped through a chute and between a pair of thin plastic strips of material together with means for enclosing the head of lettuce with the said strips and for heat sealing the strips around the head of lettuce throughout 360°.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawings in which:

FIG. 1 is a front elevational schematic view of the present head lettuce packaging machine, with the lettuce enclosing cylinders retracted.

FIG. 2 is a fragmentary side elevational view schematically showing the cylinders brought together in overlapped relation for enclosing the head of lettuce between a pair of plastic strips.

FIG. 3 is a fragmentary end elevational view looking into the open end of one of the cylinders shown in FIG. 4.

FIG. 4 is a fragmentary perspective view illustrating the mounting and support of the opposed cylinders in the lettuce packaging machine shown in FIG. 1.

FIG. 5 is similar to FIG. 1, but with the lettuce head support means retracted.

FIG. 6 is a fragmentary section taken in the direction of arrows 6—6 of FIG. 5.

FIG. 7 is a fragmentary perspective view of the lettuce head yieldable backing with assembled support means.

FIG. 8 is a fragmentary view, similar to FIG. 2, but on an increased scale for clarity.

It will be understood that the above drawings illustrate merely a preferred embodiment of the present invention and the method thereof, and that other embodiments are contemplated within the scope of the claims hereafter set forth.

Referring to the drawing, FIGS. 1 and 4 show schematically the head lettuce packaging machine which includes the spaced supports 11 fragmentarily shown between which a pair of aligned horizontally disposed coaxial cylinders of different diameter are mounted for

simultaneous movement towards and away from each other.

The power driven shafts 12 and 13 are normally interposed between and supported upon the supports 11. Each shaft includes the threaded portions 14 and 15 of opposite hand threadedly engaging the respective cylinder assemblies 24 and 25 for effecting simultaneous movement towards and away from each other.

For this purpose there is provided an electric or other type of motor 16 with drive shafe 17 driving through sprocket wheels 18 and 19 and chain 20 the shaft 13; and through sprocket wheels 21 and 22 and chain 23 the additional shaft 12. On operation of said motor and its shaft 17 in one direction, both of the shafts 12 and 13 will rotate in one direction; and by reversing the motor both shafts will rotate simultaneously in the reverse direction.

Each of the cylinder assemblies 24 and 25 include a pair of longitudinally spaced laterally extending brackets 26 and 28 which adjacent their outer ends as at 27 and 29 are slidably mounted upon shafts 12 and 13. One of the brackets, as for example the outermost brackets 26 in each cylinder assembly is threadedly engaged as at 27 with the respective threaded elements 14 and 15 of shafts 12 and 13. The other brackets 28 of each cylinder assembly are merely apertured so as to be slidably mounted upon and extend movably over the respective shafts 12 and 13. This provides a simplified and convenient construction by which the cylinder assemblies 24 and 25, including the respective cylinders 30 and 31, are reciprocally moved towards and away from each other in unison.

Each of the cylinders includes a traverse yieldable backing arranged across the inner ends of each cylinder inwardly of the inner ends and adapted to engage and yieldably support a head of lettuce therebetween as the cylinders are brought together as enclosed by strips of plastic material 45, 46, hereafter described.

Each of the said yieldable backing means includes an annular ring 32 adjustable longitudinally within the inner ends of each of the cylinders and fixedly secured in position by the fasteners 33. Spanning each of the rings 32 is a rubber or elastic or otherwise yieldable membrane or backing 34 which is adapted to cooperatively and yieldingly engage the head of lettuce L as the cylinders are brought together, FIG. 2, for conforming the respective strips 45 and 46 as they are unwound over and around opposite sides of the head of lettuce, being brought together at their peripheral edges, FIG. 2, for the sealing operation.

Cooperating heat sealing means are peripherally arranged and around the exterior inner ends of each of the said cylinders and these sealing means are brought together in cooperative sealing engagement throughout 360° to effect a continuous 360° weld in an air tight packaging.

This sealing means includes an annular tapered anvil 35 which is fixedly secured over the inner end of cylinder 30 and opposed therefrom an annular electrical resistant heated tapered die 36 fixedly secured over the inner end portion of cylinder 31 so that as the cylinders are brought together, FIG. 2, anvil and die are brought into cooperative pressing engaging registry with the cylinders overlapped at their ends for fusing together throughout 360° portions of the plastic strips 45 and 46, which had been stretched around the head of lettuce by the equipment shown in FIG. 2.

Retractable head lettuce supporting means are slidably mounted upon each cylinder and are normally biased inwardly and project forwardly of the cylinders when the cylinders are separated for supporting a head of lettuce therebetween prior to the packaging operation. For this purpose there is provided adjacent the rear portion of each cylinder a radial plate 37 fixedly secured thereto and

which mounts an electrical magnet **38** or other magnetic device. The retractable head lettuce support means includes a set of parallel spaced rods **40** which are arranged upon the interior of each cylinder in sets and movably extend through corresponding apertures in the radial support plates **37** in each cylinder, FIG. 1.

The rods in each set are arranged as a portion of a concave support adjacent the lower portions of the cylinder as shown in FIG. 3 and cooperate when brought together, FIG. 1, for supporting the head lettuce prior to the packaging operation.

Secured in each cylinder intermediate its ends is an apertured radial guideplate **39**, adapted to slidably and guidably receive rods **40**.

Radial plate **42** is fixedly secured to each of the rods **40** and is movably interposed between plate **37** and guideplate **39**.

Each set of rods **40** at their outer ends are interconnected by backing plate **41** fixedly secured thereto; and said rods are biased inwardly to the position shown in FIG. 1 by coiled springs **43** bearing against supports **11**. The rods normally assume the position shown in FIG. 1 and are adapted to support a head of lettuce L before the cylinders have been brought together.

OPERATION

On operation of motor **16** cylinders **30** and **31** move towards each other relative to the stationary sets of rods **40** until the cylinders have assumed the overlapped sealing position shown in FIG. 2. At which time, the strips of plastic, such as polyethylene, have been unrolled from their drums as at **45** and **46** and are interposed between the inner ends of cylinders **30** and **31** and enclose the head of lettuce L, FIG. 2. In such innermost position of each the cylinder plates **37** have moved to such position that the electromagnets **38** carried thereby are in operative engagement with spacer plate **42** connected with each set of rods **40**. Accordingly, after the heat sealing and fusing operation, on power retraction movements of each of the cylinders **30** and **31** in unison, the sets of rods **40** will be simultaneously withdrawn to a retracted position against the action of springs **43** for a limited period to permit the packaged head of lettuce to drop down into opening **55** of chute **54** and thence through its outlet **56**, FIG. 1. Magnets **38** are de-energized and rods return to their normal support position, FIG. 1, under action of springs **43**.

In conjunction with each of the sets of support rods **40** and arranged upon the interior of each of the cylinders towards the lower sides are the pairs of upright tapered guideplates **44**. These guide the head lettuce L to a centralized position between the cylinders as the cylinders are brought together, FIG. 2.

The respective plastic strips **45** and **46** are normally mounted upon a pair of rolls and journalled as at **47–48** with their axes parallel and directly above cylinders **30** and **31**.

Both of the drums of plastic material in strips **45** and **46** feed through the guide or drive sprockets or rollers **49** moving the plastic material down past and between the opened cylinders, FIG. 1, whence the material moves over the roller **51** and the salvage material after the welding and stripping operation winds onto a drum as at **52**, power driven as at **53**, schematically shown.

The head of lettuce L in the first instance is dropped through the chute **50** diagrammatically shown so as to position the lettuce between the two opposed strips of plastic material **45** and **46** so that the lettuce rests between the said strips, but upon the two sets of opposed support rods **40** as shown in FIG. 1.

The operation is as follows:

(1) A head of lettuce is initially dropped through the chute **50** so as to move between and to partly separate the opposed parallel strips of sheeting **45**, **46**, which may be polyethylene or any other plastic material susceptible to heat welding for effecting a seal.

(2) The lettuce head drops down and rests upon the rod supports **40** with the sheeting **45**, **46** upon its exterior.

(3) The cylinders **30** and **31** under power gradually are brought together as in FIG. 2, into a concentric overlapping relationship at which time the lettuce head is engaged by the yieldable backing means **34** which stretches the plastic sheets **45**, **46** so that they snugly extend around the lettuce head with the sheets being brought together at the same time between heat sealing means **35**, **36**.

(4) At this point, FIG. 2, the tapered die **36** is sufficiently heated that when in registry with anvil **35** will cause a fusing or heat sealing and partial destruction of the plastic material upon the exterior of the seal so that there will be provided an airtight package enclosing the lettuce and with the salvage being stripped as at **51**, **52** and wound upon power driven roll **52** for disposal.

(5) The cylinders are then retracted simultaneously and this retraction also causes a retraction and a separation of the inner ends of the rods **40** permitting the packaged lettuce head completely enclosed and sealed throughout 360° in a plastic bag to drop through the chute **54** for disposal.

Having described my invention, reference should now be had to the following claims.

I claim:

1. In a head lettuce packaging machine comprising a support;

a pair of aligned co-axial cylinders of different diameter mounted upon said support for simultaneous movements towards each other in overlapping relation at their inner ends and for movement away from each other;

power means connected to said cylinders for effecting said movements in unison;

a transverse, yieldable backing across each cylinder inwardly of its inner end adapted to engage and yieldably support a head of lettuce therebetween;

means for simultaneously feeding a pair of thin plastic strips transversely of the inner ends of said cylinders for enclosing a lettuce head as said cylinders are brought together;

means for receiving and guiding a lettuce head between said cylinders and said plastic strips;

cooperating annular heat sealing means peripherally nested around the exterior of said cylinders adjacent their inner ends for engaging and sealing said strips together throughout 360°, a retractable lettuce head support means slidably mounted upon each cylinder normally biased and projecting forwardly thereof when the cylinders are separated;

and operative means on each cylinder for withdrawing said support means on separation movements of said cylinders releasing the packaged head of lettuce, said support means being thereafter released for return to normal position to receive the succeeding head of lettuce.

2. In the lettuce packaging machine of claim **1**;

the yieldable backing for each cylinder, including a ring mounted for longitudinal adjustment within and secured to each cylinder;

and a flexible rubber backing spanning each ring, conforming to the shape of a head of lettuce as said cylinders are brought together for stretching said strips therearound.

3. In the lettuce packaging machine of claim **1**, said plastic strips being initially wound upon parallel spaced drums and arranged above said cylinders;

and means for guiding said strips past said cylinders.

4. In the lettuce packaging machine of claim **1**, said plastic strips being initially wound upon parallel spaced drums and arranged above said cylinders;

means for guiding said strips past said cylinders;

said means for feeding said strips includes a power operated stripper drum for taking up the salvage from both strips.

5. In the lettuce packaging machine of claim 1, the power means and mounting for said cylinders including a pair of horizontally disposed parallel spaced power driven rods on said support;

longitudinally spaced brackets on each cylinder apertured to receive and for movement longitudinally of said rods;

and screw means on each rod threadedly engaging one bracket for each cylinder.

6. In the lettuce packaging machine of claim 1, said heat sealing means including an annular tapered anvil on one cylinder, and an annular electrically resistant heated tapered die on the other cylinder, said anvil and die being in compressive engaging registry with the cylinders brought together and overlapped at their inner ends for fusing registry with said plastic strips.

7. In the lettuce packaging machine of claim 1, and a retractable lettuce head support means slidably mounted upon each cylinder normally biased and projecting forwardly thereof when the cylinders are separated;

and operative means on each cylinder for withdrawing said support means on separation movements of

said cylinders releasing the packaged head of lettuce;

said lettuce support means including opposed aligned sets of parallel rods guidably mounted on the cylinders respectively;

each set arranged as an arcuate supported adjacent the bottom of each cylinder on its interior;

a spacer plate interconnecting the rods in each set and movable therewith;

said operative means including a magnetic means upon the outer end of each cylinder retainingly engageable with the spacer plate of each set of rods for retracting movement of said cylinders.

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