

Jan. 29, 1963

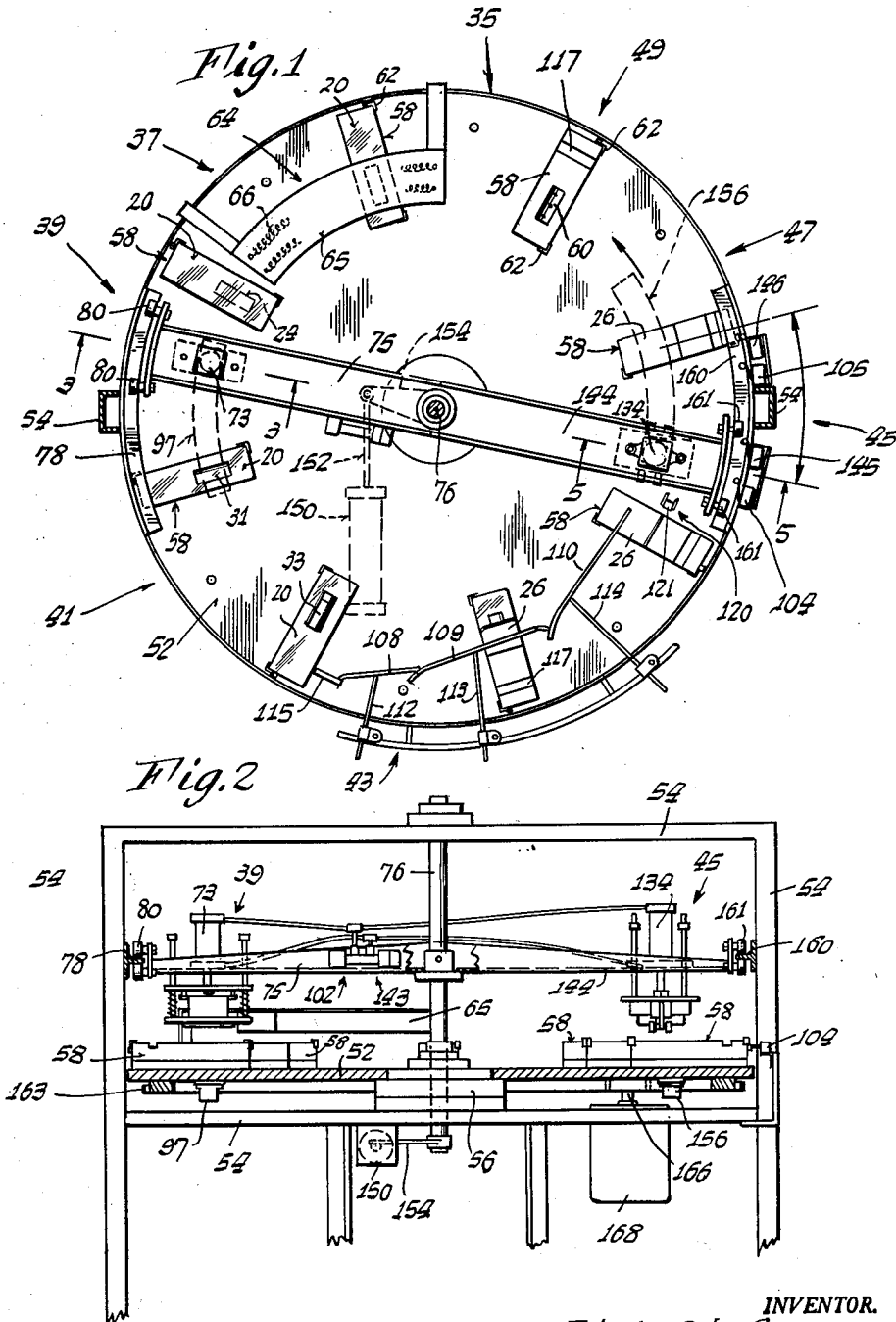
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APPARATUS FOR PACKAGING ARTICLES

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4 Sheets-Sheet 1



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Fig. 5

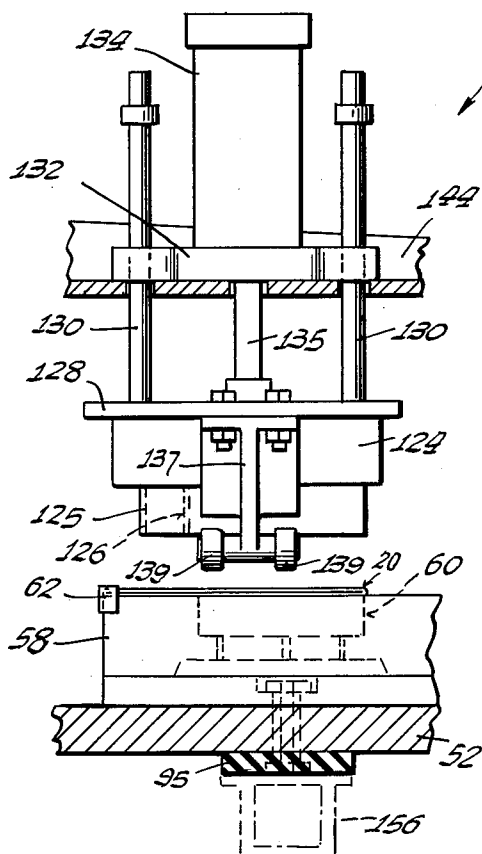


Fig. 6

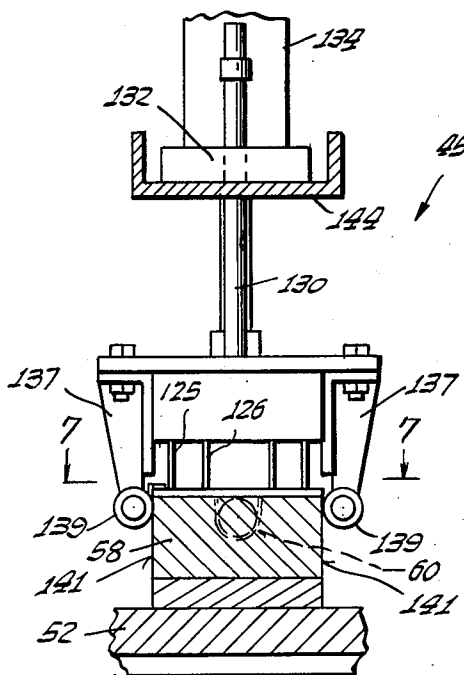
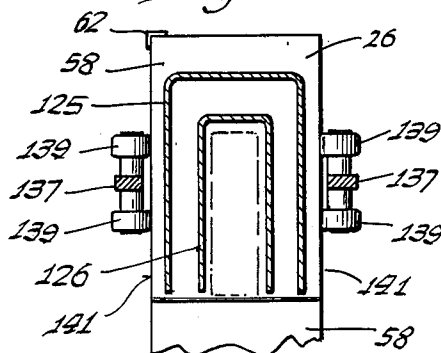


Fig. 7



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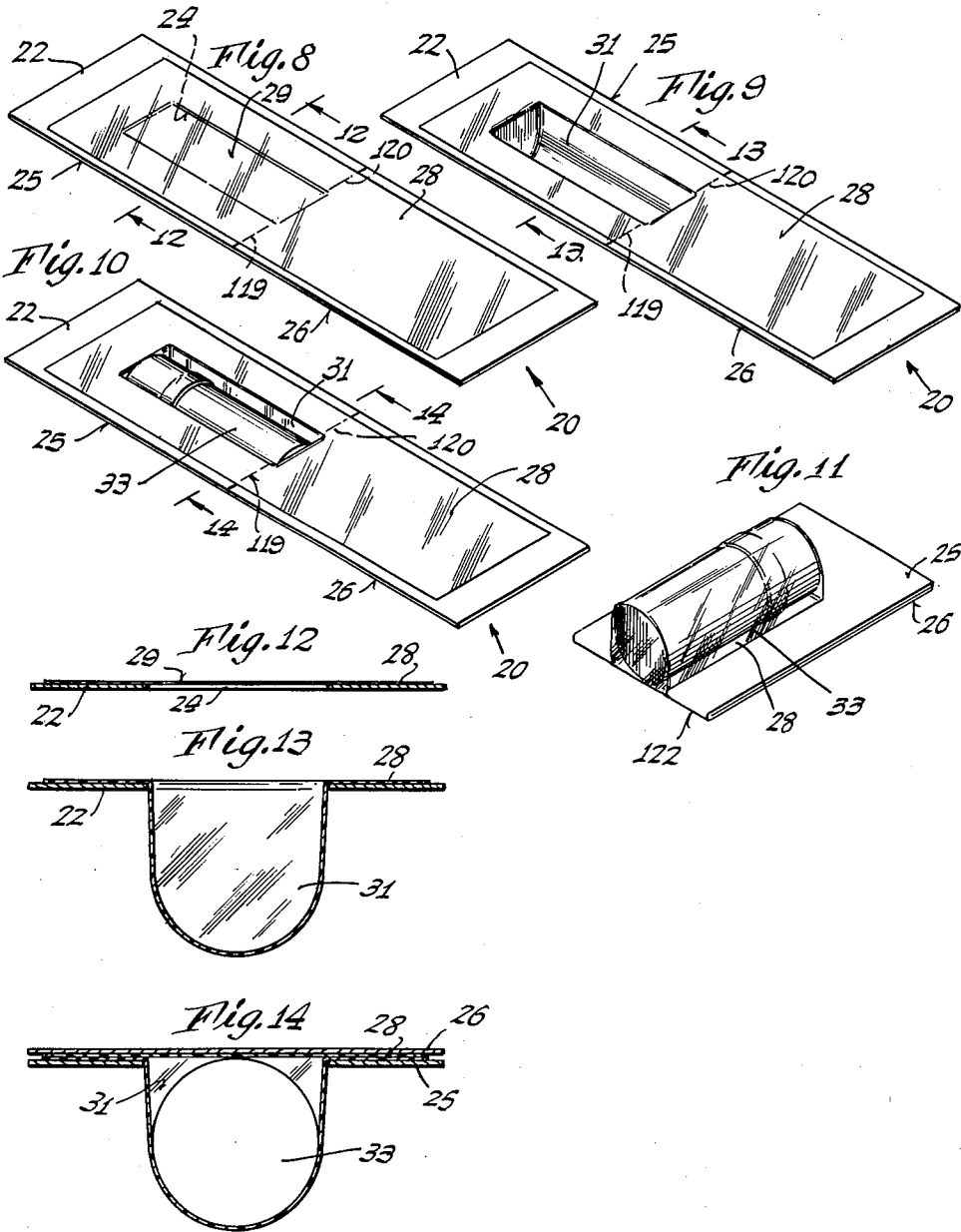
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4 Sheets-Sheet 4



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APPARATUS FOR PACKAGING ARTICLES

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This invention relates to equipment for automatically packaging articles in wrappers or packages at least portions of which are constituted of stretchable and shrinkable plastic members, and further relates to methods of packaging articles in wrappers or packages of the above type.

One object of the invention is to provide a novel and improved automatic packaging apparatus for wrapping or enclosing articles in wrapper components of the type including transparent plastic members or portions which apparatus is especially compact in its construction and requires relatively little space, especially floor space.

Another object of the invention is to provide an improved automatic packaging apparatus as above set forth, wherein the packaging of the articles is characterized by a continuous movement of the packaging material or components in a curved path thereby to effect a relatively high rate of production.

Still another object of the invention is to provide an improved automatic packaging machine in accordance with the foregoing, which is efficient in its operation, and effective and reliable in carrying out the desired packaging procedure.

A further object of the invention is to provide an improved and novel automatic packaging machine as above characterized, wherein there is required a minimum amount of hand labor, thereby to hold down the labor costs involved in the packaging.

Yet another object of the invention is to provide a novel and advantageous automatic packaging machine of the type outlined, wherein a maximum degree of accessibility is had, thereby to simplify adjustment and servicing operations when these might be required.

A still further object of the invention is to provide an improved automatic packaging apparatus in accordance with the foregoing, which utilizes for the most part components or parts which are not especially critical or intricate in construction, or costly to fabricate, thereby enabling the apparatus to be produced at a minimum cost.

A feature of the invention resides in the provision of an improved automatic packaging apparatus of the above type, which is relatively simple and straight-forward in its construction, thereby to insure a maximum degree of reliability and a minimum amount of servicing.

Yet another object of the invention is to provide a novel, simple and effective method for packaging articles, utilizing a packaging or wrapping components or pieces having transparent portions or members in order to obtain an effective display package.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference are utilized to designate like components throughout the several views, in which:

FIGURE 1 is a top plan view of the improved automatic packaging apparatus as provided by the invention, shown on a reduced scale.

FIG. 2 is a side elevational view of the apparatus of FIG. 1.

FIG. 3 is a fragmentary view of the apparatus partly in side elevation and partly in vertical section, the section being taken on the line 3-3 of FIG. 1. This figure shows the membrane forming punch in its inoperative or raised position.

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FIG. 4 is a fragmentary vertical sectional view of the components shown in FIG. 3 but taken at right angles to the section of this previous figure and showing the forming punch in its lowered, operative position.

FIG. 5 is a fragmentary view partly in elevation and partly in vertical section, of the apparatus shown in FIGS. 1 and 2, the section being taken on the line 5-5 of FIG. 1. This figure illustrates a heater iron which constitutes the heat-applying fastening means, said iron being shown in its raised position.

FIG. 6 is a view partly in elevation and partly in vertical section, of the components shown in FIG. 5, the section being taken at right angles to the section of FIG. 5 and the heater iron being shown in its lowered, operative position.

FIG. 7 is a fragmentary horizontal sectional view, taken on the line 7-7 of FIG. 6.

FIG. 8 is a perspective view of the packaging means or component which is utilized with the present improved apparatus as provided by the invention.

FIG. 9 is a perspective view of the packaging component showing the plastic membrane portion thereof after it has been formed in the apparatus of the invention.

FIG. 10 is a view like FIG. 9, showing further an article which is to be packaged, inserted in the pocket of the component.

FIG. 11 is a perspective view of the completed package and article contained therein, as adapted for display purposes.

FIG. 12 is a transverse sectional view, taken on the line 12-12 of FIG. 8.

FIG. 13 is a transverse sectional view, taken on the line 13-13 of FIG. 9.

FIG. 14 is a transverse sectional view, taken on the line 14-14 of FIG. 10.

As mentioned above, the apparatus and method of the invention are concerned with the packaging of small articles or objects of merchandise in a manner such that the packaged articles are of attractive appearance and especially suited for display purposes. The apparatus and method utilize especially formed or fabricated wrappers or packaging components of the type wherein at least a portion is constituted of a transparent plastic or equivalent member or membrane which is stretchable and shrinkable, said membrane spanning an opening, formed in a stiff, supporting portion of the component. Such a component, in various stages of its processing, is illustrated in FIGS. 8 through 14. In FIG. 8 the component, designated generally by the numeral 20, comprises a relatively stiff, foldable or bendable sheet-like member or card 22 which is provided with a through opening 24 disposed in one of two halves 25, 26, the opening 24 being shown in FIG. 8 as disposed in the upper half 25 of the member or card 22.

Overlying a large portion of the surface of the card 22 is a sheet of thin, stretchable and shrinkable plastic 28, said plastic having a portion 29 which spans and closes-over the opening 24. The material of the plastic sheet 28 may be of any suitable composition, one type of plastic which has been found to be satisfactory being that commercially known as polyvinyl chloride. Plastic sheets or membranes of this formulation may be readily stretched and formed after being heated to an extent. Also, after such forming the plastic may be heat shrunk whereby it tends to return to its smallest possible size, and in such shrinking the sheet or membrane may stretch itself taut about any enrobed object. Thus, when the membrane 24 is heated it may be formed by being displaced laterally, so as to obtain a pocket-like shape forming a recess 31, as seen in FIG. 9. Such forming of the plastic may be effected by the use of a suitable punch-

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like tool after the plastic has been heated. Or, it may be effected by subjecting the plastic to a differential in pressure, as by creating a vacuum at one side of the membrane 24, and this vacuum forming may be utilized in conjunction with the above-mentioned punch.

After the membrane 24 has been formed with the pocket 31, an article which is to be wrapped for display, as indicated at 33 in FIG. 10, may be placed in the pocket. Thereupon the packaging component 20 may be folded about a transverse center line, that is, folded in half to produce the assemblage illustrated in FIG. 11. Such assemblage may be made permanent by securing operation, and thereafter the formed membrane 24 may be heat shrunk, to cause it to closely conform to the contour of the packaged article 33.

The apparatus of the invention involves packaging wrappers or components such as the component 20 illustrated in FIG. 8, and performs operations on said components during which procedure the objects which are to be packaged are added, and completed packages containing the articles as illustrated in FIG. 11 are discharged from the final station of the machine. The machine is characterized by a continuous movement of the packaging components in a discontinuous circular path, from the time that the components are fed to the machine until they are completely processed and discharged therefrom.

In carrying out the processing of the packaging component 20 the apparatus of the invention as illustrated in FIGS. 1 and 2 has a plurality of operation-performing stations located roughly in a circle, and each packaging component 20 when fed into the machine is received and carried by a holder which travels in a predetermined circular path past the said operation-performing stations. Referring to FIG. 1 and proceeding counterclockwise the apparatus has a component-receiving station 35, a heating station 37, a membrane-forming station 39, an article-loading station 41, a component-folding station 43, a fastening station 45, a membrane-shrinking station 47, and finally a discharge station 49. From the time that the packaging component 20 is placed in the apparatus station 35 until the time that it is discharged at the discharge station 49, the packaging component is continuously in movement, and travels in a discontinuous circular path in a counterclockwise direction as viewed in FIG. 1.

In effecting such path and travel of the packaging components, the apparatus employs a rotary carrier or dial 52 disposed generally horizontally and turnably mounted on a framework 54. The rotary carrier or dial 52 as seen in FIG. 2 rests on a central bushing or shouldered bearing 56 of relatively large diameter, which not only provides a stable support for the dial but also enables access to be had to the peripheral portions thereof, as may be readily understood.

On the said peripheral portions of the dial 52 a number of holders 58 are provided, said holders being shown as of rectangular configuration and being arranged in radial positions. As seen in FIG. 1, eight holders 58 are provided on the dial 52. However, a greater or lesser number may be utilized, depending upon the required operations which are to be performed and the desired speed or productivity of the machine. Each of the holders 58, see FIGS. 3-7, has in its upper portion a recess 60 having generally the shape to which the membrane portion 29 of the packaging component 20 is to be formed. The recesses 60 are arranged to register with the openings 24 in the cards 22 of the packaging components, and the latter are placed flat upon the holders, as seen for example at the stations 37 and 39 in FIG. 1. To position the packaging components 20, and for effecting an automatic feeding of the components the holders 58 may be provided with small, angular corner projections 62, FIGS. 1 and 3-7, which are arranged to engage corresponding corner portions of the packaging components. Said components may be fed to and de-

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posited on the holders 58 by any suitable well-known means which are not shown herein for the sake of clarity of illustration.

Considering FIGS. 1 and 2, the heating station 37 has an arcuate-shaped radiant heater 64 which may comprise a suitable heat-resistant hood 65 in which heating coils 66 are disposed, said coils being connected to a suitable source of energy and being so arranged as to extend over the path of travel of the membrane portion 29 of the packaging component. Accordingly, after the components are loaded on the holders at the station 35, the first operation at the station 37 will heat the membranes 29 in readiness of forming of the same at the forming station 39.

Referring to FIGS. 1-4 at the forming station 39 there is provided a forming punch 68, which is mounted on and depends from a plunger plate 69 reciprocated vertically by a plunger rod 71 secured to a piston 72 which latter is reciprocable in a vertically disposed cylinder 73 arranged to receive fluid for actuating the piston. The cylinder 73 is rigidly mounted on a pivoted arm 75 which is carried by a vertical shaft 76 having upper and lower bearing points in the machine frame 54. The cylinder-carrying arm 75 has a limited arcuate movement, and is steadied in the horizontal plane by a track segment 78 carried by the machine frame 54, and by rollers 80 engageable with the upper and lower surfaces of the track 78 and mounted on the end of the arm.

By such organization the forming punch 68 may travel in a curved path simultaneously with the holders 58 and components 20 carried thereby during the forming of the membrane portions 29 of the components.

The plunger plate 69 may be provided with a spring pad 82, FIGS. 3 and 4, carried by vertical slide bars 84 passing through the plunger plate 69, helical compression springs 86 being provided on the bars 84 to normally urge the pressure pad 82 in a downward direction. The underside of the pad 82 may have a resilient facing member 88, as for example a sheet formed of sponge rubber or similar material. With such organization the packaging component 20 will be initially engaged first by the pressure pad 82, 88 as the punch 68 is made to descend, and thereafter engagement will take place between the punch and the membrane portion 29 of the component 20. With the membrane pre-heated, continued downward movement of the punch 68 will effect a secure clamping of the component 20 by the pressure pad 82, 88 while at the same time the membrane 29 will be stretched and formed by the punch. To supplement the forming action of the punch 68 a vacuum is created in the recesses 60 of the holders 58 as the latter traverse the forming station 39.

Referring to FIGS. 3 and 4, channels 90 are provided in the holders 58, communicating with manifold passages 91 which in turn communicates with bores 92 provided in fittings 93 utilized to secure the holders 58 to the dial. The fittings pass through the dial 52, as shown, and also secure in place a flat circular rubber sealing member 95 which is disposed at the underside of the dial 92.

At the forming station 39 an arcuate vacuum chamber 97 is provided under the dial 52 and connected by means of a suitable line 98 with a vacuum producing means such as a vacuum pump. The vacuum chamber 97 has a passage 100 arranged to communicate with the bores of the fittings 93 as the latter, dial 52 and sealing member 95 travel over the vacuum chamber 97. Thus, as the forming station 39 a vacuum is introduced into the recesses 60 of the holders 58, which supplements the forming action of the punch 68 and effectively forms a pocket shape in the membrane 29, as seen in FIG. 9.

The descending or advancing movement of the punch 68, and also the raising or retracting movement of the same is effected by the piston-and-cylinder assemblage 72, 73 as controlled by solenoid valves 102 (FIG. 2), which in turn may be under the control of electrical switches 104 and 105 mounted on the machine frame 54

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and actuated by the holders 58 as the dial 52 turns. The switches 104 and 105 are so arranged that as a holder 58 and packaging component 20 carried thereby enter the forming station 39 the punch 68 will be made to descend, and as the holder and packaging component leave the forming station after completion of the forming of the membrane portion 29 the punch 68 will be raised. It is understood that during the lowered position of the punch 68 it will travel with the holder 58 and packaging component, the carrier arm 75 pivotally moving as permitted by the shaft 76 carrying the arm. The said travelling movement of the punch 68 and arm 75 is effected in a novel manner, in accordance with the invention, as will be later brought out in detail.

Upon a holder 58 and packaging component 20 leaving the forming station 39 after forming of the membrane portion 29 they enter the article-loading station or area 41 where the articles 33 are deposited in the pockets 31 formed in the membranes. The loading of the articles 33 may be done manually by an operator, or else such loading and depositing of the articles may be effected by an automatic well-known loading device, details of which are not shown herein for purposes of clarity of illustration.

After the articles 33 have been loaded into the pockets 31 of the packaging components the folding station 43 is entered. At this station there are provided three folding rails 108, 109 and 110, which are fixedly carried by the machine frame 54 through the medium of adjustable supporting rods 112, 113 and 114 respectively. The initial or first folding rail 108 has a pilot portion 115 which is arranged to extend under the lower halves 26 (see FIG. 8) of the packaging components and into clearance slots 117 provided in the holders 58, as the latter and packaging components carried thereby advance upon the first rail. The components 20 may be provided with score lines 119, 120 to facilitate the folding of the components by the rails 108, 109 and 110. Referring to FIG. 1 the rail 108, 115 is shown as about to be received in a slot 117 of the adjacent holder 58, under the packaging component 20 carried thereby. Also, the folding bar 109 is shown as having folded a half portion 26 of the component 20 to a position beyond a 90° angle. In this figure the folding bar 110 is also illustrated as having completed the folding of the half 26 of a preceding component 20, so that the said component is folded completely in half.

After the folding station 43 there may be optionally provided a creasing station 120 in the form of a roller 121 disposed immediately over the path of the crease 122 of the folded packaging component. The roller 121 may be rotatably carried by a suitable bracket support fixedly mounted on the machine frame 54. In passing under the roller 121 the fold of the folded component 20 will be tightly creased.

After creasing, the folded components 20 pass to the fastening station 45, where the two folded halves of the components are secured together, and this is preferably accomplished by the application of heat and pressure to the folded components. It will be noted from an inspection of FIGS. 8-14 that when the packaging component 20 is folded, the plastic sheet 28 will be folded on itself with the opposed surfaces in engagement with each other. Under such circumstances, the application of heat and pressure will cause a fusion of the two folded halves of the components 20. In applying heat and pressure, the invention provides at the fastening station 45 a heater 124 from which there depend rigid U-shaped members or irons 125 and 126, this assemblage being carried by a plunger plate 128 supported by vertical slide rods 130 passing through a bearing member 132 on which there is mounted a cylinder-and-piston assemblage 134 having a piston rod 135 rigidly secured to the plunger plate 128. The said plate also mounts depending brackets 137 at the lower extremities of which rollers 139 are carried, the

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said rollers being adapted to engage oppositely facing surfaces 141 of the holders 58 when the plunger plate 128, heater 124 and irons 125, 126 are in the lowered positions illustrated in FIGS. 6 and 7. By such organization a drive is established between the turning dial 52 and the assemblage or components including the irons 125, 126 and piston-cylinder assemblage 134 shown in FIGS. 5 and 6. The piston cylinder assemblage 134 is carried by a pivotally mounted arm 141 which is secured to the vertical shaft 76. Preferably, as shown, the arm 144 extends opposite to the arm 75, and since both arms are secured to the shaft 76 the drive which is effected by the rollers 139 engaging the opposite surfaces 141 of each holder 58 as it passes through the fastening station 45, in accordance with the present invention, effects the arcuate shifting movement of the forming punch 68 described above.

The heater irons 125, 126 are lowered and raised by means of the cylinder-and-piston assemblage 134, and this is under the control of solenoid valves 143, FIG. 2, which in turn are controlled by electrical switches 145, 146 mounted on the machine frame 54 and arranged to be actuated by each of the holders 58 as it passes along the fastening station 45. Thus, upon a holder 58 entering the station 45 the heated irons 125, 126 will be lowered, engaging the folded components 20 and fastening the folded halves together by a heat-fusion process. At the same time the rollers 139 engaging the opposite surfaces 141 of the holders will effect a drive of the pivoted arms 75, 144, and during the arcuate movement of the pivoted arms the irons 125, 126 will remain in engagement with the folded component, to fasten the two halves thereof together. Simultaneously with this operation the forming punch 68 will be lowered and made to travel with the associated holder 58 and component 20, effecting a forming of the plastic membrane 29 of the component. Upon the pivoted arms 75, 144 completing their arcuate movement, the heater irons 125, 126 will be raised as well as the punch 68, and with such raising movement the arms may be returned to their starting positions by a power means comprising a cylinder and piston assemblage 150 under the control of a suitable solenoid valve and the electrical switch 146. The cylinder assemblage 150 is connected through a suitable piston rod 152 and arm 154 to the shaft 76 to effect clockwise turning movement of the shaft and the arms 75, 144, as viewed in FIG. 1.

Upon the holder 58 and folded components 20 leaving the fastening station 45 they enter the shrinking station 47, where heated air may be directed against the formed membranes 29, to heat shrink the same. Such heated air may be supplied by one or several jets or orifices directed against the bottom of the dial 52 so as to strike the fittings 93. Or, a heat chamber 156 similar to the vacuum chamber 97 may be provided under the dial 52 and connected with a suitable source of heated air under pressure. The action of the heated air on the formed membrane 29 will effect a rapid shrinking of the latter, whereby it will closely conform to the contour of the packaged article 33 as illustrated in FIG. 13.

At the ejection station 49 the package and contained article may be discharged from the holders 58 by any suitable means.

As with the pivoted arm 75, the arm 144 may be steadied by a track sector 160 mounted on the machine frame 54, and by rollers 161 carried by the arm 144 and engaging the upper and lower sides of the sector 160.

In accordance with the invention the dial 52 is driven by power applied to the peripheral portions thereof. As seen in FIG. 2, the underside of the dial is provided with gear elements or teeth 163 which may be formed on gear sectors forming a complete spur gear. The gear teeth 163 may be engaged by a suitable pinion carried on a motor shaft 166 powered by an electric gearhead motor 168, as seen in FIG. 2. With such organization a positive drive is established to the dial 52, and but little space is

required in effecting the turning movement and transmission for driving the dial.

It will now be understood from the foregoing that we have provided a simple and effective apparatus and method for wrapping or packaging small articles or objects of merchandise, utilizing a packaging component which has at least a portion in the form of a transparent plastic membrane adapted to be stretched and shrunk whereby the package and article is especially suited for display purposes. The apparatus is effective and reliable in its operation, and has a relatively high productivity, being characterized by a continuous movement of the packaging component in a circular path, during which the operations are performed on the components to package the desired articles.

In accordance with the method of the invention, the packaging components 20 are carried in a predetermined circular path, and while continuously moving are subjected to a heating operation, a membrane-forming operation, thereafter receiving the articles to be packaged, and then proceeding to a folding operation, a creasing operation and a fastening operation, and finally a heat-shrinking operation whereby the formed membrane is shrunk and stretched taut about the packaged article. The method is effective and simple to practice.

By virtue of the rotary dial and circular arrangement of the operation-performing stations the apparatus is compact and relatively small in size, and requiring a minimum amount of floor space. Moreover, the various operation-performing stations are readily accessible and may be easily adjusted as required. No special or intricate, costly components are required in the fabrication of the apparatus, and the desired packaging operations are carried out in a reliable manner.

Variations and modifications may be made within the scope of the claims, and portions of the improvements may be used without others.

I claim:

1. Apparatus for automatically packaging articles comprising a holder arranged to receive and support thereon a single unitary foldable packaging card component of the type having an opening in it and having a stretchable and shrinkable plastic membrane spanning said opening, said holder having a recess formed therein adapted to register with the said opening, a turnable dial for effecting a continuous travel of the holder in a predetermined circular path past a plurality of operation-performing stations located roughly in a circle about said dial, power means for continuously rotating said dial at a predetermined constant rate, automatic means for heating the membrane of the package component as the holder moves past a heating station in said path, automatic forming means including an arm rotatably journaled in spaced relationship with said dial, a punch means connected to one end of said arm and rendered operative for forming a pocket in said heated membrane by forcing the same into the holder recess as the holder moves past a forming station in said path, a loading station for inserting an article into the pocket formed in said membrane, automatic means comprising a stationary arm engageable with the card component for folding said component onto itself while on the holder and without tilting of the holder to close over the formed membrane so as to encase the article therein as the holder moves past a folding station in said path, automatic means for securing together the folded portion of the folded component as the latter is carried by the holder and said holder moves past a fastening station in said path, said securing means including a sealing heater operatively connected to the other end of said arm, means for coupling said arm to said dial when said punch and sealing heater are rendered operative whereby said arm is driven with said dial through a predetermined angular distance to effect the forming and securing of the card component at its respective station without interruption in the movement of said

dial, and automatic means for heating the formed membrane to heat shrink it as the holder moves past a shrinking station in said path.

2. The invention as defined in claim 1 in which there are two piston-and-cylinder assemblies carried respectively by the said arm for effecting advancing movement of the punch and sealing heater with respect to the dial, and in which there is a common control means associated with the said assemblies.

3. The invention as defined in claim 2 in which the control means includes a solenoid valve common to both said piston-and-cylinder assemblies.

4. The invention as defined in claim 1 in which the rotatably journaled arm is carried by a single common shaft, and in which there is a piston-and-cylinder assembly drivingly connected with the said shaft for effecting a return movement of the pivoted arms and the punch and heated iron carried thereby.

5. The invention as defined in claim 1 in which the powered means includes a mechanical transmission having gear elements extending around the peripheral portions of the said dial.

6. The invention as defined in claim 1 in which the means for heating the membrane includes an arcuate-shaped radiant heater disposed above the said turnable dial and over the circular path of the holder.

7. The invention as defined in claim 1 in which the means for heating the formed membrane to heat-shrink it includes an opening passing through the said dial and communicating with the recess of the holder, and includes an arcuate chamber disposed below the dial and arranged to communicate with said opening as the dial is made to turn.

8. The invention as defined in claim 1 in which there is means for effecting a tight crease in the folded component, said means comprising a turnable roller fixedly mounted above the dial and adapted to engage the fold of the folded component.

9. The invention as defined in claim 1 in which said arm is disposed above the turnable dial and has a pivotal axis substantially coinciding with the axis of the dial.

10. The invention as defined in claim 1 including apparatus for creating a suction in the recess of the said holder, to cause the membrane of the packaging component to be sucked into the recess, said apparatus including a vacuum chamber disposed below the turnable dial and including a circular sealing element arranged between the vacuum chamber and the dial to minimize leakage of fluid into the vacuum chamber.

11. An apparatus for automatically packaging an article in a card package of the type formed of a card blank having an opening to define a window therein and having a stretchable and shrinkable plastic membrane spanning said opening through which the article may be viewed in the finished package, comprising a turnable dial; a plurality of operation performing stations circumferentially spaced about said dial; a plurality of holders, each adapted for carrying the card blank, circumferentially spaced on said dial, each of said holders having a recess therein conforming in shape to the opening formed in the card carried thereby, means for continuously rotating said dial for successively passing each of said holders and card blank carried thereby through each of said stations, said stations including a station for forming a pocket in the plastic membrane adaptable for receiving therein the article to be packaged, a loading station for positioning an article in said pocket, a station for folding the card over onto itself to enclose an article placed in said pocket, and a station for fastening the folded card, said pocket forming station and fastening station being opposed on said dial, a cross arm extending between said forming station and said fastening station; means for rotatably mounting said cross arm in spaced relationship to said dial, a reciprocal punch means operatively associated with the holder in the forming sta-

tion, said punch means being connected to one end of said arm, a reciprocating sealing means operatively associated with the holder in the fastening station, said sealing means being connected to the other end of the arm, means for simultaneously actuating said punch means and sealing means to effect simultaneous forming of the pocket in the card in the forming station and sealing of the card in fastening station; and means connected to said sealing unit to engage the holder passing through said fastening station whereby said arm is coupled to said dial to move therewith through a predetermined angular distance sufficient for the punch means and sealing means connected thereto to form the pocket and make the seal in card on which they operate in their respective stations, and means for returning said arm to its start position.

12. An apparatus for automatically packaging an article in a card package of the type formed of a card blank having an opening therein to define a window therein and having a stretchable and shrinkable plastic membrane spanning said opening through which the article may be viewed in the finished package, comprising a turnable dial; a plurality of operation performing stations circumferentially spaced about said dial; a plurality of holders, each adapted for carrying the card blank, circumferentially spaced on said dial, each of said holders having a recess therein conforming in shape to the opening formed in the card carried thereby, means for continuously rotating said dial at a constant rate for successively passing each of said holders and card blank carried thereby through each of said stations, said stations including a station for forming a pocket in the plastic membrane adaptable for receiving therein the article to be packaged, a loading station for positioning an article in said pocket, a station for folding the card over onto itself to enclose an article placed in said pocket, and a station for fastening the folded card, said pocket forming station and fastening station being diametrically opposed on said dial, a cross arm extending diametrically of said dial between said forming station and said fastening station, means for rotatably mounting said arm in spaced relationship to said dial, a reciprocating punch means movable between lowered operative position and raised inoperative position operatively associated with the holder in the forming station, said punch means being connected to one end of said arm, a reciprocating sealing means movable between lowered operative position and raised inoperative position operatively associated with the holder in the fastening station, said sealing means being connected to the other end of the arm, means for simultaneously actuating said punch means and sealing means to lowered position to effect simultaneous forming of the pocket in the card in the forming station and sealing of the card in fastening station; and means for coupling said cross arm to said dial when said punch means and sealing means are lowered to operative position whereby said cross arm moves through a predetermined angular distance sufficient for the punch means and sealing means connected thereto to form the pocket and make the seal in card on which they operate in their respective stations, and means for retaining said arm to its start position.

13. Apparatus for automatically packaging articles comprising a holder arranged to receive and support thereon a single unitary foldable packaging card component of the type having an opening in it and having a stretchable and shrinkable plastic membrane spanning said opening, said holder having a recess formed therein adapted to register with the said opening, a turnable dial for effecting repetitive travel of the holder in a predetermined circular path past a plurality of operation-performing stations located roughly in a circle about said dial, power means for rotating said dial at a predetermined rate, automatic means for heating the membrane of the package component as the holder moves past a heating station in said path, automatic forming means including an arm rotatably journaled in spaced relationship with said dial, a punch means connected to one end of said arm and rendered operative for forming a pocket in said heated membrane by forcing the same into the holder recess as the holder moves past a forming station in said path, a loading station for inserting an article into the pocket formed in said membrane, automatic means comprising a stationary arm engageable with the card component for folding said component onto itself while on the holder and without tilting of the holder to close over the formed membrane so as to encase the article therein as the holder moves past a folding station in said path, automatic means for securing together the folded portion of the folded component as the latter is carried by the holder and said holder moves past a fastening station in said path, said securing means including a sealing heater operatively connected to the other end of said arm, means for coupling said arm to said dial when said punch and sealing heater are rendered operative whereby said arm is driven with said dial through a predetermined angular distance to effect the forming and securing of the card component at its respective station, and automatic means for heating the formed membrane to heat shrink it as the holder moves past a shrinking station in said path.

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OTHER REFERENCES

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