

May 12, 1959

D. P. SMITH

2,885,850

COMMODITY PACKAGING MACHINE

Filed Dec. 10, 1956

3 Sheets-Sheet 1

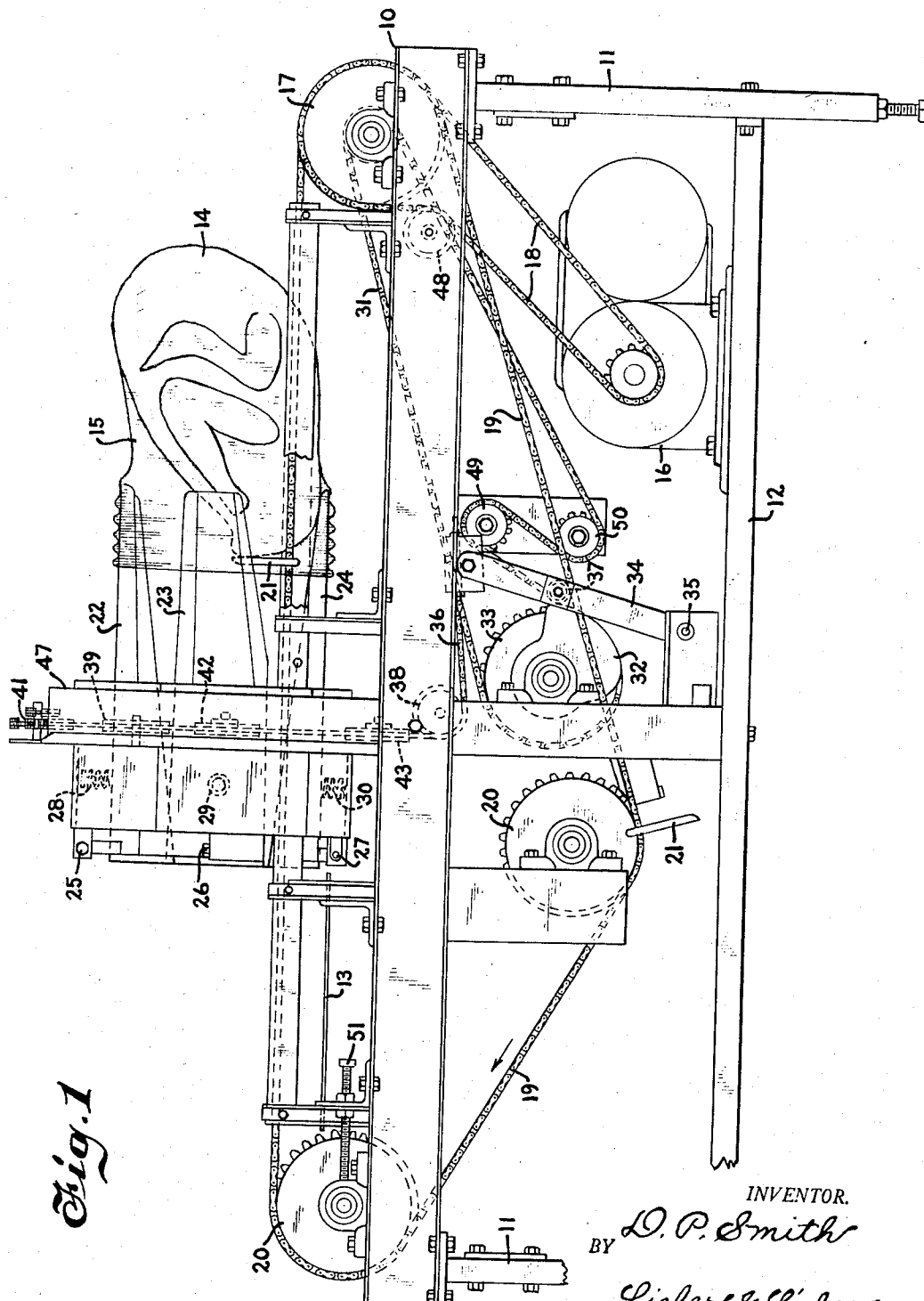


Fig. 1

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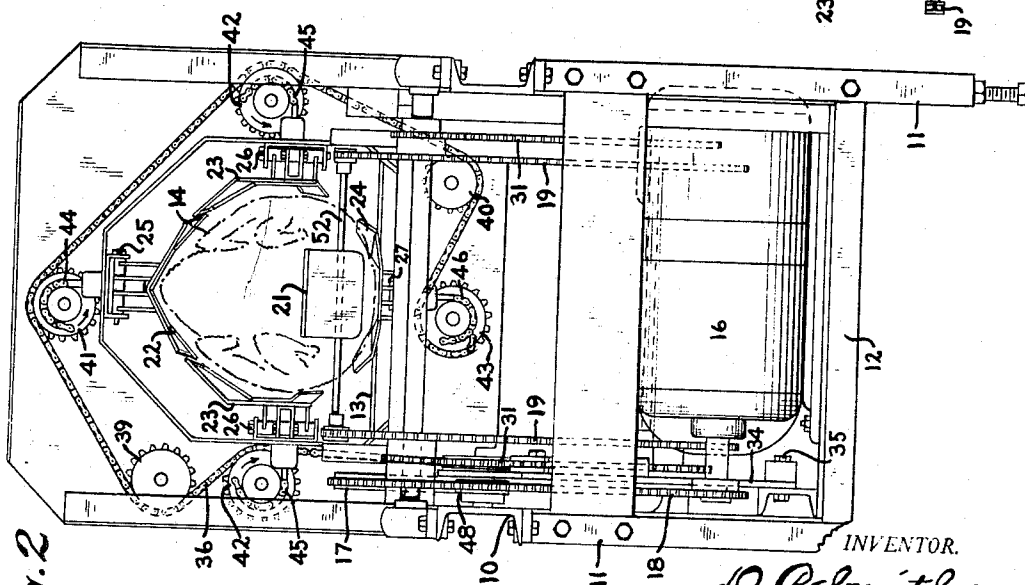
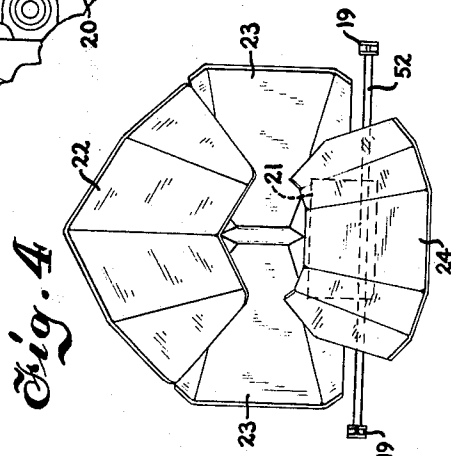
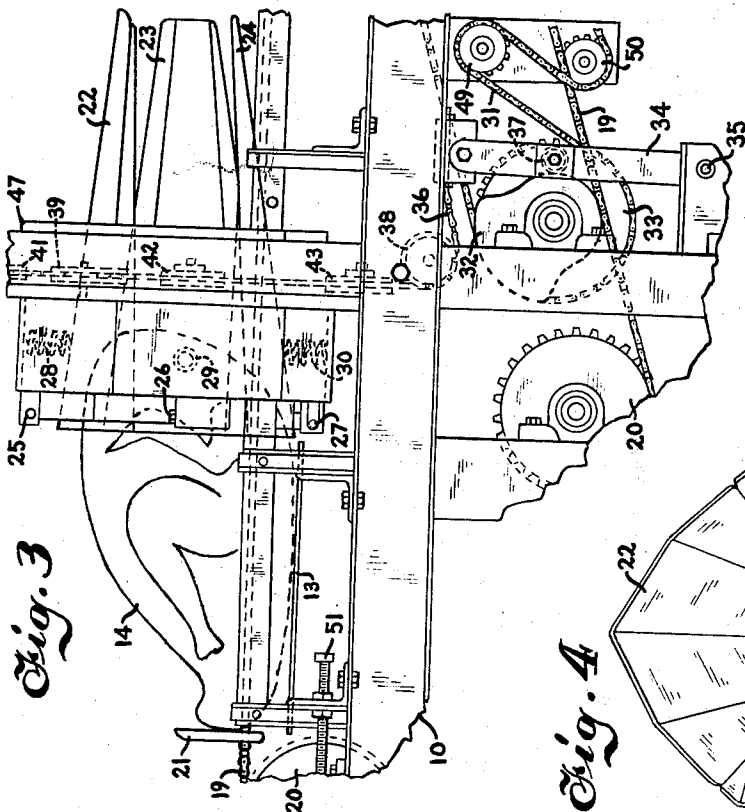
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3 Sheets-Sheet 2



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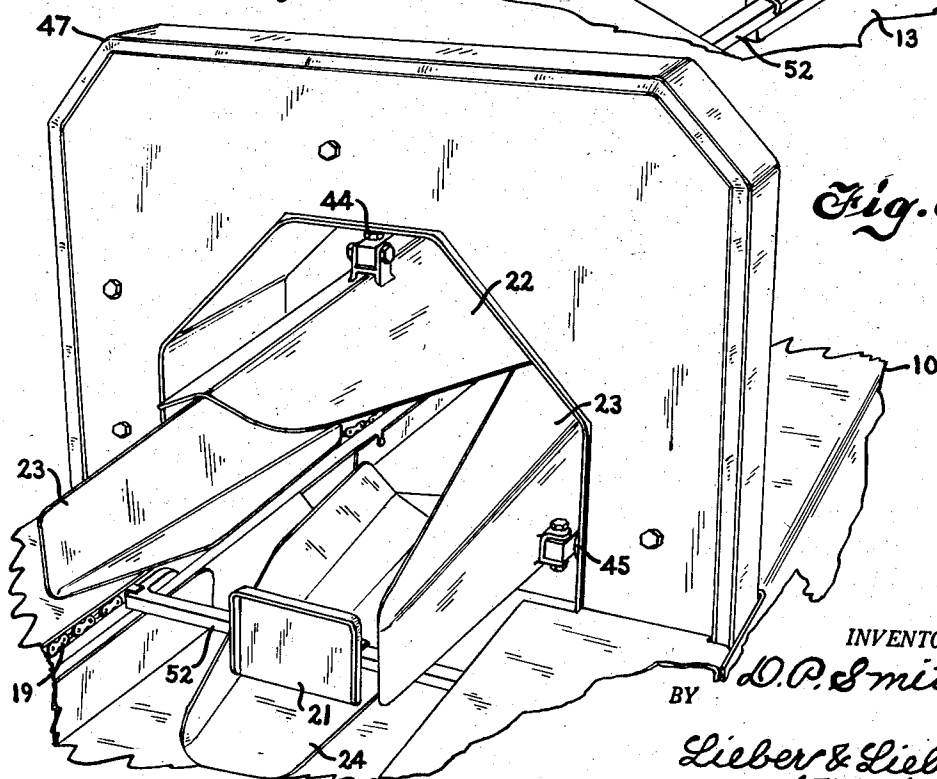
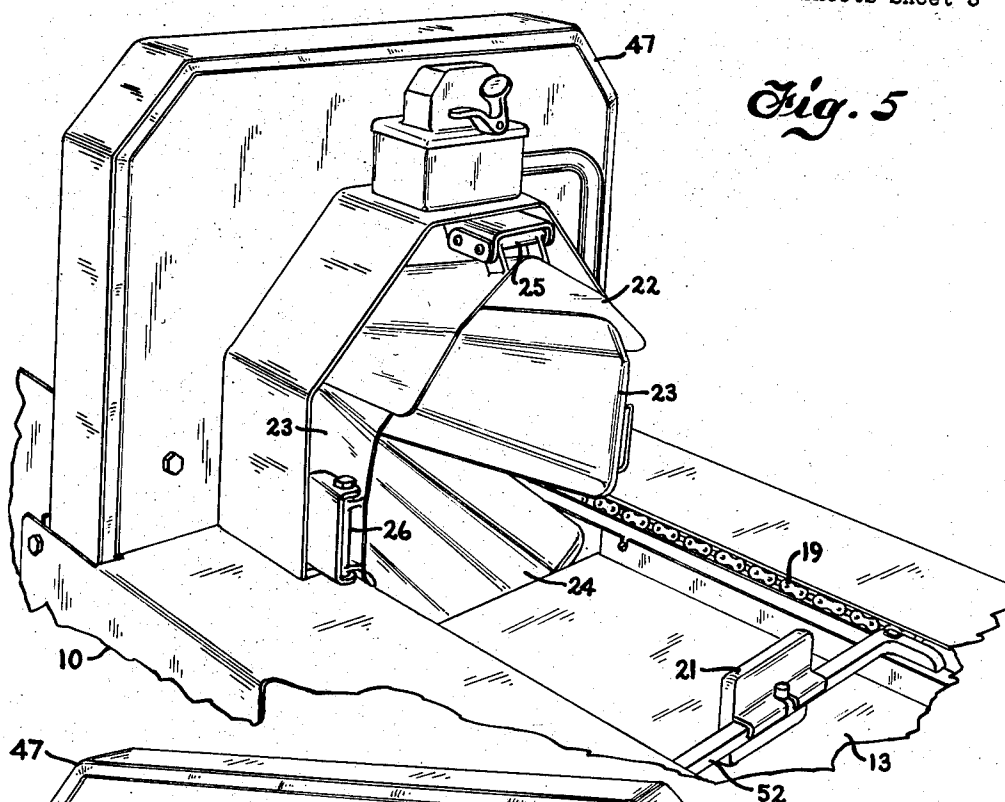
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COMMODITY PACKAGING MACHINE

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3 Sheets-Sheet 3



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COMMODITY PACKAGING MACHINE

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Application December 10, 1956, Serial No. 627,422

7 Claims. (Cl. 53-258)

The present invention relates generally to improvements in the art of packaging commodities, and relates more particularly to improvements in the construction and operation of machines for packaging individual articles such as fowl in bag-like containers formed of flexible and relatively elastic sheet materials.

A primary object of this invention is to provide an improved apparatus for packaging relatively pliant bodies in snug fitting and shape conforming flexible wrappers which is relatively simple in construction and highly efficient and economical in use.

In the packaging of fresh dressed poultry, it has heretofore been customary practice to first subject the body to a so-called squatting operation to thereby shorten the bird and broaden its girth for merchandising purposes, and to thereafter package the previously squatted and medially expanded body in a relatively large and loose fitting bag-like container in a separate operation. In order to impart a somewhat more attractive appearance to the final commodity package and to aid in obtaining a snug fitting wrapper as well as to minimize possible deterioration of the commodity, these prior wrappers were frequently formed of a film adapted to be contracted or shrunk by certain heat treatments or the like, and the stuffing or packaging operations were often performed in the presence of a vacuum. However, these prior poultry packaging methods were quite objectionable for a number of reasons, particularly in the excessive number of separate operations required and the resultant costly equipment and time necessary to perform such operations as well as the excessive handling of the commodity occasioned by the squatting, stuffing or filling, and subsequent shrinking operations. Furthermore, the particular film utilized in these methods required careful selection and handling, and when supplied with printed matter, the printing frequently became objectionably distorted upon shrinking the film to conform to the irregular confined body.

In the co-pending United States patent application of Paul B. Hultkrans, Milton E. Griem and Donald W. Davis, Serial No. 488,806, filed February 17, 1955, now abandoned, for Method of Packaging Commodities, a new method for packaging fowl in elastic bag-like wrappers is disclosed which eliminates the afore-mentioned objections and greatly facilitates the packaging of such commodities. In the method disclosed in this co-pending application, an inherently elastic bag-like wrapper of somewhat smaller normal capacity than the article to be packaged is initially stretched to accommodate the commodity, and after insertion of the commodity within the stretched wrapper, the stretching pressure is released to thereby permit the wrapper to contract snugly about the commodity by reason of its elastic qualities alone. This method has proven exceedingly advantageous because of its simplicity, economy, minimum number of operations or steps, and reduction in the amount of handling necessary to carry out the method, and the resultant final packages are of greatly enhanced appearance due to the uniform snugness

of the wrapper and elimination of surface irregularities therein.

It is therefore an important and more specific object of the present invention to provide an improved simple, novel and relatively automatically operable apparatus for commercially exploiting the method disclosed in the co-pending application of Paul B. Hultkrans et al., Serial No. 488,806, now abandoned.

Another specific object of the invention is to provide an improved commodity packaging apparatus which is adapted to receive and automatically circumferentially stretch bag-like wrappers formed of relatively elastic sheet material to a desired predetermined extent in properly timed relation to the commodity as it is advanced toward the wrapper.

Still another specific object of my invention is to provide a new and improved commodity packaging apparatus which is adapted to receive successive articles to be wrapped and to automatically deliver the same in properly timed succession directly into individual circumferentially expanded flexible bag-like containers.

A further specific object of this invention is to provide an improved poultry packaging apparatus embodying means for conveying the article to be packaged along a predetermined path, means located within the path for loosely receiving and internally engaging a flexible bag-like container, and means operable in timed relation to the conveying means for expanding the bag receiving means and circumferentially stretching the bag as the article is conveyed along the path toward and into the stretched bag.

A further specific object of the present invention is to provide simple, safe and economically operable poultry packaging apparatus which is adapted to automatically protectively enwrap successive bodies of fowl in snug fitting and attractive merchandising wrappers while simultaneously effectively squatting or longitudinally compressing and laterally expanding the body.

These and other specific objects and advantages of the present invention will become apparent from the following detailed description.

A clear conception of the several features constituting the present improvement and of the details of construction and mode of operation of typical apparatus embodying the invention may be had by referring to the drawings accompanying this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a fragmentary side view of a typical poultry packaging machine embodying the invention and showing the body of a fowl being injected into a circumferentially stretched bag-like wrapper;

Fig. 2 is a fragmentary end view of the machine with the wrapper expander and commodity guide likewise in extended condition;

Fig. 3 is another fragmentary side view of the machine but showing the fowl being conveyed toward the receiving or entry end of the wrapper expanding and commodity guide horn which is shown in collapsed condition;

Fig. 4 is a somewhat enlarged end view of the wrapper expanding and commodity guide horn taken from the wrapper receiving and final delivery end and showing the same in collapsed condition;

Fig. 5 is an enlarged fragmentary perspective view of the commodity delivery portion of the machine showing the commodity conveying member approaching the entry end of the collapsed guide and wrapper expander; and

Fig. 6 is a similarly enlarged fragmentary perspective view taken from the final delivery end of the guide and wrapper expander showing the same distended and with

the commodity conveying member proceeding there-through.

While the invention has been shown and described herein as being especially applicable to the packaging of poultry or fowl in transparent bags and as embodying a particular number of commodity conveying and pusher plates successively movable through a guide and wrapper stretching member having a given number of distensible arms, it is not desired or intended to unnecessarily restrict or limit the invention by reason of such specific embodiment; and it is also contemplated that certain specific descriptive terms used herein shall be given the broadest possible interpretation consistent with the disclosure.

Referring to the drawings, the improved poultry packaging apparatus shown therein, comprises, in general a main frame 10 having supporting legs 11, a lower shelf 12 and a table 13 for receiving successive bodies of freshly dressed fowl 14 or the like to be packaged individually within a flexible bag-like wrapper 15 formed of elastic sheet material. Mounted upon the lower shelf 12 is a motive power source such as a suitable electric motor 16 driving a sprocket 17 through the chain 18. A pair of chains 19 are driven by the motor 16 through the chain 18 and sprocket 17 about sprockets 20 and these chains 19 have secured thereto at spaced points therealong one or more pusher plates or conveying flights 21 driven along a definite path in the direction of the arrow as shown in Fig. 1. Located within and surrounding the path of the pushing members 21 is a tapered guide conduit formed by an annular series of pivotally supported plates 22, 23, 24, the plates being constantly resiliently urged about their pivots 25, 26, 27 respectively to tapered condition as shown in Fig. 3 by means of suitable springs 28, 29, 30 or the like so that the smaller outlet end of the tapered conduit formed by the plates can loosely receive a bag-like wrapper placed thereon. Also driven by the motor 16 through chain 18 and sprocket 17 by means of a chain 31 is a cam 32 keyed to the sprocket 33 so that the cam is driven in timed relation with the conveying means 19, 20, 21, and co-acting with the cam 32 is a lever 34 swingable about a lower pivot 35 and linked at its upper end through a chain 36 with the plates or arms 22, 23, 24 as will hereinafter more fully appear, the lever having a medial roller 37 coacting with the surface of the cam 32 to swing the lever periodically and thereby also swing the plates about their respective pivots 25, 26, 27 to distend the conduit outlet and circumferentially expand a wrapper 15 supported thereon as shown in Fig. 1 when the pusher plate 21 and the body 14 carried thereby is conveyed to the wrapper.

As shown, the actuating mechanism for expanding or distending the plates 22, 23, 24 may consist of the lever 34 periodically actuable by the cam 32 and the chain 36 attached to the upper swinging end of the lever, and this chain 36 is guided about sprockets 38, 39, 40 and coacts with sprockets 41, 42, 43 respectively linked by means of chains 44, 45, 46 to the swinging tapered ends of the respective guide plates 22, 23, 24, to swing these plates outwardly about their respective pivots whenever the cam 32 forces the lever 34 to the right. The frame 10 may be formed of suitable angle iron or channel bar stock, and this frame may be enclosed in a suitable housing if desired. Likewise, the actuating mechanism for the plates 22, 23, 24 forming the tapered guide conduit for the body 14 may be protectively enclosed in a suitable housing 47, and it should be noted that in their normal positions the plates 22, 23, 24 form a conduit having a sufficiently large inlet to receive a large poultry body and an outlet sufficiently small to loosely internally engage a bag 15 placed thereover. In expanded or distended condition, the actuating mechanism for the plates should be such as to distend or expand the outlet ends of the plates 22, 23, 24 sufficiently not only to expand

the wrapper to an extent necessary to accommodate the body 14 but also to an extent whereby sufficient internal pressure is exerted on the wrapper to retard displacement thereof from the plates as the body is advanced into the expanded wrapper by the pushing member 21 thereby causing sufficient longitudinal pressure to be exerted upon the body 14 during the packaging operation to squat the bird and longitudinally compress the same as shown. To maintain the chain 18 under sufficient tension, an adjustable idler sprocket 48 may be provided in a customary manner, and idler sprockets 49, 50 may also be provided for the chain 31 while the sprocket 20 may be adjusted as by means of an adjustment bolt 51 as shown. The pusher plates 21 may be suitably secured to the laterally spaced chains 19 as by means of a cross bar 52 secured at the opposite ends thereof to the chains, and the members 21 should be sufficiently large to effectively convey relatively large bodies of fowl placed on the table 13 but sufficiently small to readily pass through the conduit formed by the plates 22, 23, 24 when expanded.

In operation, the motor 16 is initially started to thereby drive the chains 19 about the sprockets 20 and advance the pusher plates 21 toward the large inlet of the tapered conduit formed by the plates 22, 23, 24. When a selected bag-like container 15 of elastic sheet material is loosely placed upon the smaller outlet end of the conduit formed by the plates 22, 23, 24 and a pliant body of fowl is placed on the table 13, the next successive pusher plate 21 advances the fowl toward the larger inlet end of the conduit formed by the plates 22, 23, 24 and as the body progresses into the conduit, the cam 32 which is driven in timed relation to the conveyor and pushing members 21, coacts with the roller 37 of the lever 34 to swing the lever to the right about its fixed pivot 35. As the lever 34 is thus actuated by the cam, its motion is transmitted through the chain 36 to the sprockets 42, 41, 43 causing these sprockets to swing in the direction of arrows in Fig. 2 to thereby swing the respective plates 22, 23, 24 outwardly to distended condition through the respective links 44, 45, 46. As the conduit forming plates are thus distended, the bag-like container supported thereon is likewise circumferentially expanded, and the body 14 is advanced through the distended conduit and into the expanded wrapper. Because of the internal pressure exerted on the wrapper 15, it takes considerable pressure to displace the wrapper from the ends of the conduit forming plates, and as the body 14 is advanced into the expanded wrapper by the pusher member 21, the body is subjected to considerable longitudinal pressure sufficient to shorten or squat the bird while laterally expanding the same snugly within the wrapper 15 which contracts by reason of its normal elastic qualities as it is forced from the ends of the conduit forming plates 22, 23, 24. When the body is encased within the wrapper and as it is moved beyond the outlet end of the guide conduit, the surface of the cam 32 leaves the roller 37 of the lever 34 which is then swung to the left thus permitting the conduit forming plates 22, 23, 24 to return to normal position by the action of the respective compression springs 28, 29, 30 or the like. This action is of course repeated on successive bodies as they are placed upon the table 13 and the only manual operations required are the placing of the bag-like containers in position on the conduit forming plates and in the placing of the bodies to be packaged on the table 13.

From the foregoing detailed description, it is believed apparent that the improved apparatus does, in fact, provide a relatively simple and highly efficient semi-automatic device for rapidly and economically packaging poultry or the like. The improved apparatus may be readily manufactured of available materials and the several parts may be rendered adjustable as desired. It is of course obvious that the linkage between the cam 32 and the guide conduit forming plates 22, 23, 24 may be

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varied as desired so as to cause distention of the plates at properly timed intervals, and while compression springs 28, 29, 30 have been shown for constantly resiliently urging the conduit forming plates to normal tapered condition, these springs may be replaced with other suitable means for accomplishing the same purpose. The improved device has proven highly advantageous and extremely practical and efficient in actual commercial use, and the final poultry packages produced with the aid of the improved apparatus are extremely neat and attractive for merchandising purposes. It will be noted that, in contrast to prior known devices which utilize reciprocating conveyors adapted to advance the commodity into the positioned package and to thereafter be withdrawn, the present device embodies an annular series of simultaneously movable forms or forming plates 22, 23, 24 which are actuated together in properly timed relation to the commodity transporting conveyor with the movable forms or plates being opened to a position wherein the pusher portion 21 of the continuously advancing conveying means is permitted to pass entirely through the conduit area formed thereby so as to result in a continuous conveyor action, thereby permitting the forms or plates to be closed quickly and resulting in a greater percentage of cycle time for placing the next bag on the form and for permitting immediate placing of the next successive commodity in position for packaging.

It should of course be understood that it is not desired or intended to limit this invention to the exact details of construction or to the precise mode of operation herein shown and described, since various modifications within the scope of the appended claims may occur to persons skilled in the art to which this invention pertains.

I claim:

1. Apparatus for packaging pliant bodies in elastic bag-like wrappers, comprising, means including a pushing member engageable with a body to be packaged for conveying the same along a definite path, an annular series of distendable forms providing a conduit disposed within said path and adapted to loosely internally engage and support a bag-like wrapper on its outlet end, and means including a cam periodically operable in timed relation with said conveying means for distending said forms to circumferentially expand the wrapper supported thereon as the body is conveyed to the wrapper, said forms being distended sufficiently to retard displacement of the expanded wrapper therefrom as the body is advanced therein to thereby cooperate with said pushing member to exert longitudinal pressure on the body as it is packaged.

2. Apparatus for packaging pliant bodies in elastic bag-like wrappers, comprising, means for conveying a body to be packaged along a definite path, an annular series of pivotally supported plates forming a tapered conduit disposed within said path and adapted to loosely internally engage and support a bag-like wrapper on its narrow end, and means operable in timed relation with said conveying means for swinging said plates about their pivots to distend the normally narrow end and thereby circumferentially expand the wrapper supported thereon as the body is conveyed to the wrapper, the narrow end of said conduit being distended sufficiently to retard displacement of the expanded wrapper therefrom as the body is advanced therein.

3. Apparatus for packaging pliant bodies in elastic bag-like wrappers, comprising, means including a pushing member engageable with a body to be packaged for conveying the same along a definite path, an annular series of pivotally supported plates forming a tapered conduit surrounding the path of said pushing member and having a large inlet and a smaller outlet for loosely internally engaging and supporting a bag-like wrapper, and means operable in timed relation with said conveying means for swinging said plates about their pivots to distend the conduit outlet and circumferentially expand the

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wrapper supported thereon as the body is conveyed to the wrapper, the conduit outlet being distended sufficiently to retard displacement of the expanded wrapper therefrom as the body is advanced therein to thereby cooperate with said pushing member to exert longitudinal pressure on the body as it is packaged.

4. Apparatus for packaging pliant bodies in elastic bag-like wrappers, comprising, means for conveying a body to be packaged along a definite path, an annular series of pivotally supported plates forming a tapered conduit disposed within said path and adapted to loosely internally engage and support a bag-like wrapper on its narrow end, a lever having its swinging end linked with said conduit forming plates, and a cam operable in timed relation with said conveying means and coacting with said lever to actuate the same and swing said plates about their pivots to distend the normally narrow end and thereby circumferentially expand the wrapper supported thereon as the body is conveyed to the wrapper, the narrow end of said conduit being distended sufficiently to retard displacement of the expanded wrapper therefrom as the body is advanced therein.

5. Apparatus for packaging pliant bodies in elastic bag-like wrappers, comprising, means including a pushing member engageable with a body to be packaged for conveying the same along a definite path, an annular series of pivotally supported plates normally forming a tapered guide conduit surrounding the path of said pushing member and having a large inlet and a smaller outlet for loosely internally engaging and supporting a bag-like wrapper, a lever having its swinging end linked with said conduit forming plates, a cam operable in timed relation with said conveying means and coacting with said lever to actuate the same and swing said plates about their pivots to distend the conduit outlet and circumferentially expand the wrapper supported thereon as the body is conveyed to the wrapper, the conduit outlet being distended sufficiently to retard displacement of the expanded wrapper therefrom as the body is advanced therein to thereby cooperate with said pushing member to exert longitudinal pressure on the body as it is packaged, and means for returning said plates to normal position after the body has been conveyed past the outlet end thereof.

6. Apparatus for packaging pliant bodies in elastic bag-like wrappers, comprising, a source of motive power, a conveyor including a pushing member driven from said power source and engageable with a body to be packaged for conveying the same along a definite path, an annular series of pivotally supported plates normally forming a tapered guide conduit surrounding the path of said pushing member and having a large inlet and a smaller outlet for loosely internally engaging and supporting a bag-like wrapper, a lever having its swinging end linked with said conduit forming plates, a cam also driven from said power source and operable in timed relation with said conveying means and coacting with said lever to periodically actuate the same and swing said plates about their pivots to distend the conduit outlet and circumferentially expand the wrapper supported thereon as the body is conveyed to the wrapper, the conduit outlet being distended sufficiently to retard displacement of the expanded wrapper therefrom as the body is advanced therein to thereby cooperate with said pushing member to exert longitudinal pressure on the body as it is packaged, and spring means constantly resiliently coacting with said plates to return the same to normal position after the body has been conveyed past the outlet end thereof.

7. Apparatus for packaging pliant bodies in elastic bag-like wrappers, comprising, means for conveying a body to be packaged along a definite path, an annular series of distendable forms providing a conduit disposed within said path and adapted to loosely internally engage and support a bag-like wrapper on its outlet end, and means operable in timed relation with said conveying means for distending

said forms to thereby circumferentially expand the wrapper supported thereon as the body is conveyed thereto, said forms being distended sufficiently to retard displacement of the expanded wrapper therefrom as the body is advanced therein.

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