June 15, 1965 E. LAPIDES 3,188,782

FILM PACKAGING MACHINE

Filed Aug. 3, 1961 5 Sheets-Sheet 1

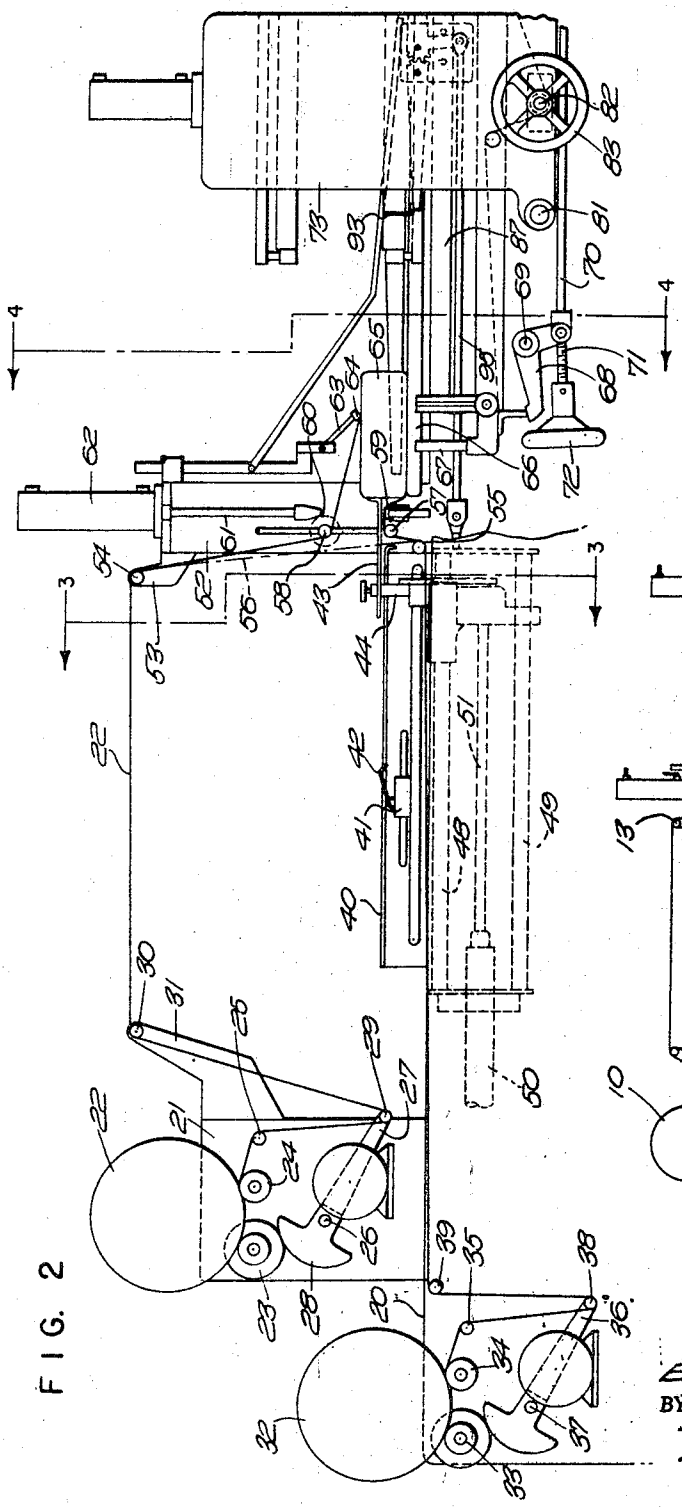


FIG. 2

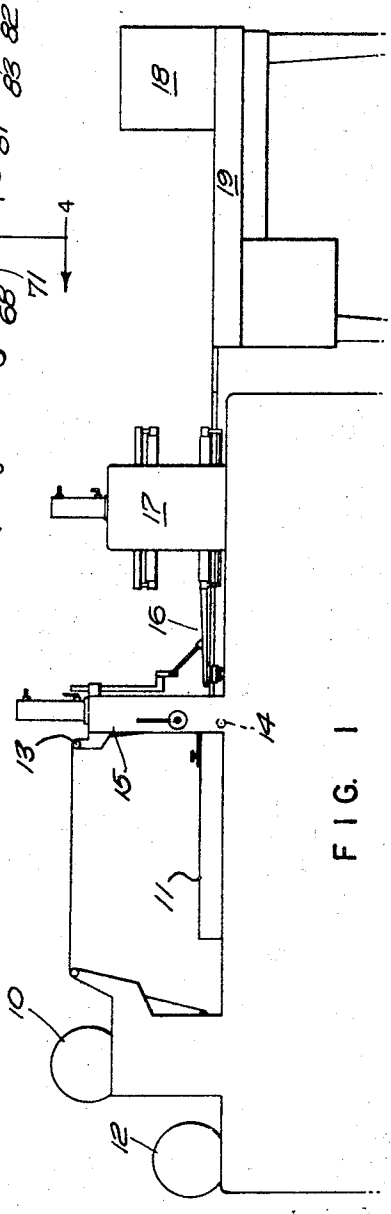


FIG. 1

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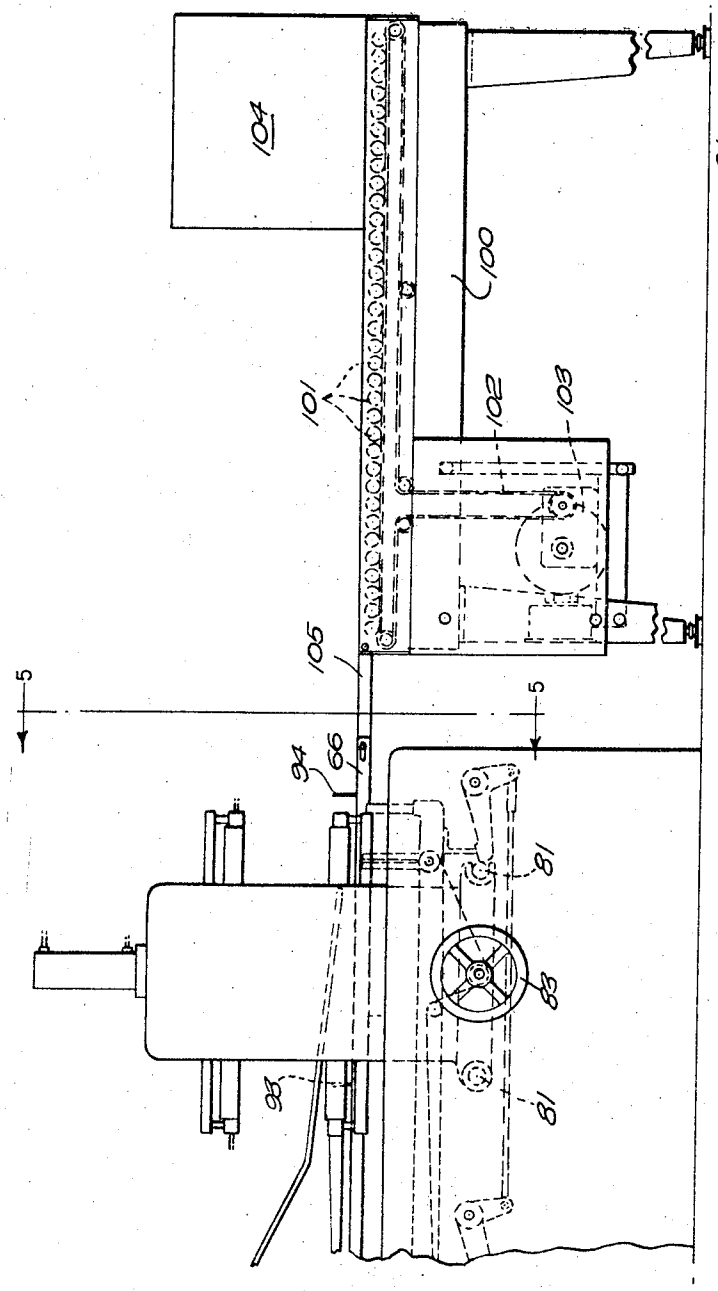


FIG. 2A

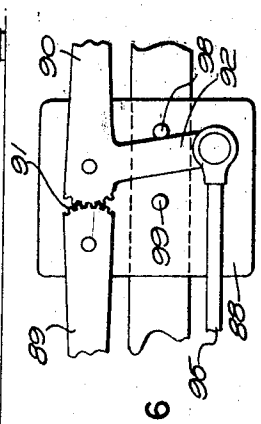


FIG. 6

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FILM PACKAGING MACHINE

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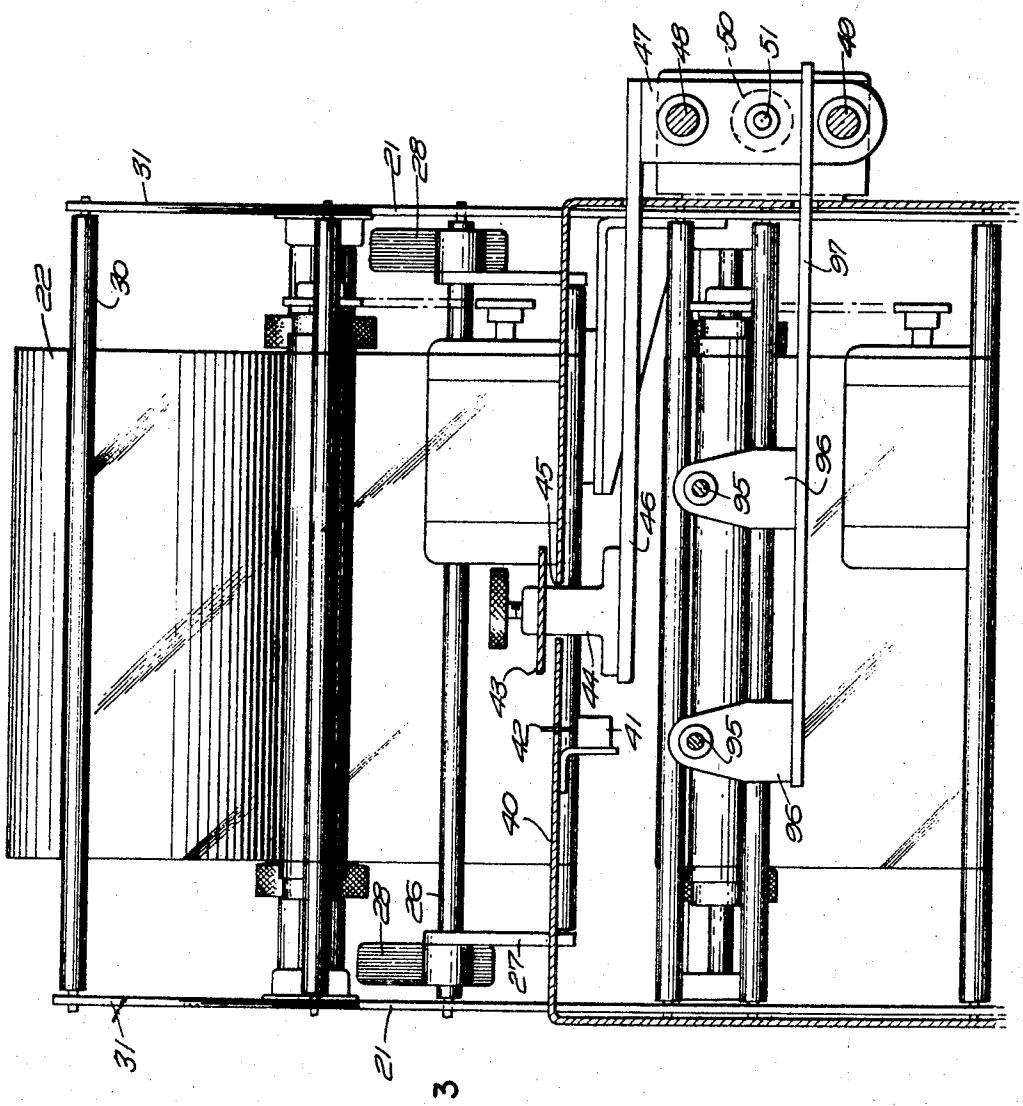


FIG. 3

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FILM PACKAGING MACHINE

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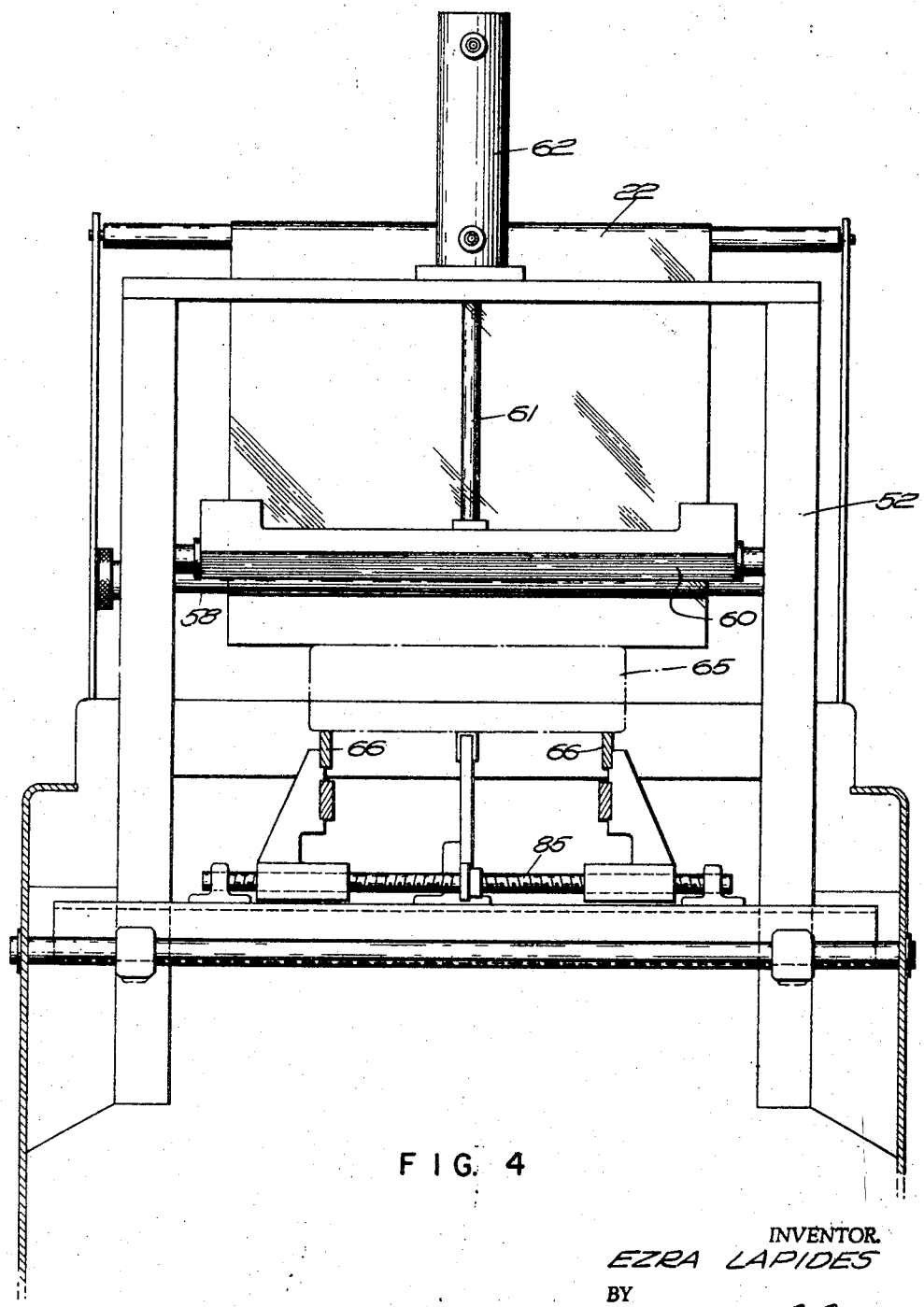


FIG. 4

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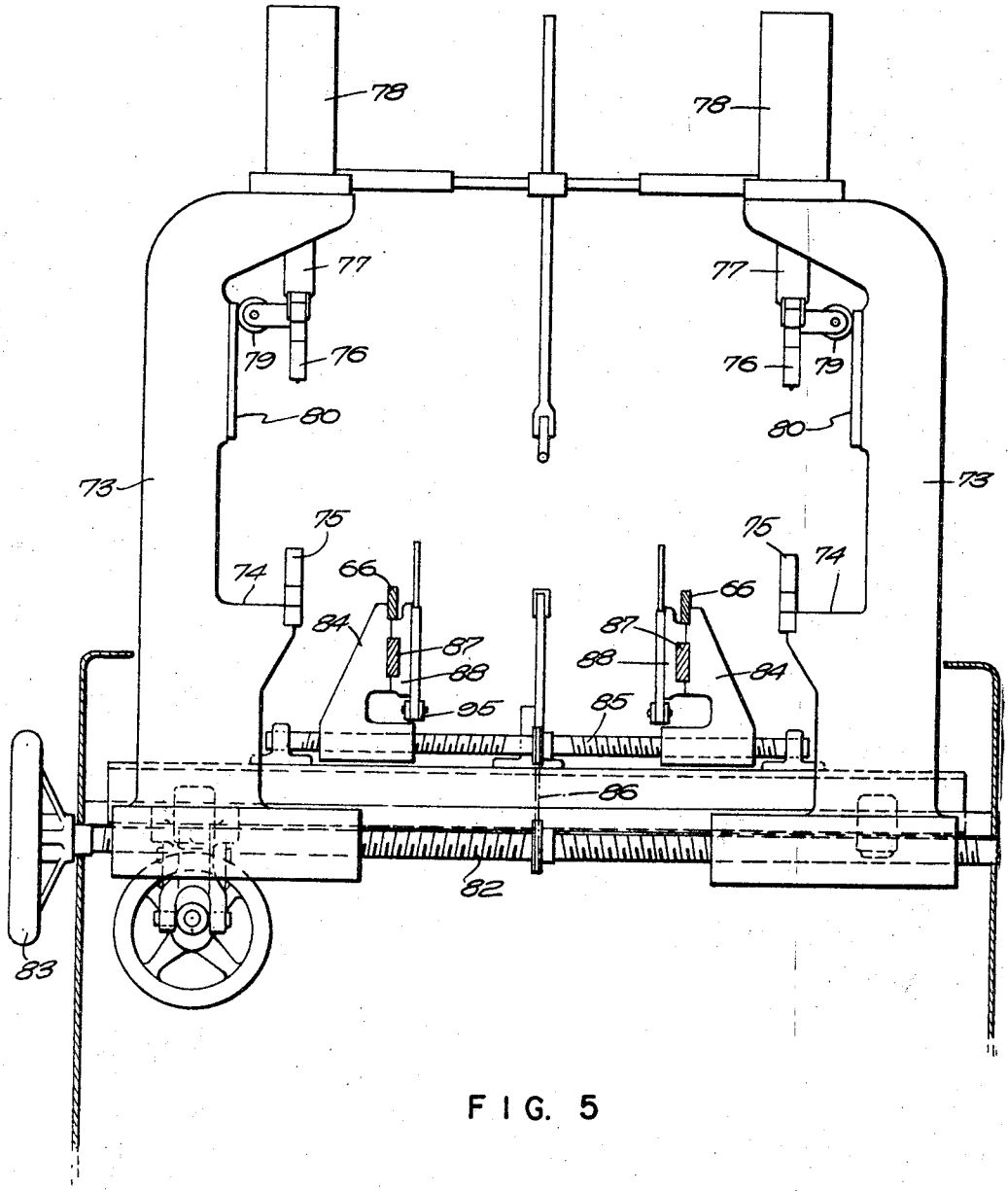


FIG. 5

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United States Patent Office 3,188,782 Patented June 15, 1965

3,188,782

FILM PACKAGING MACHINE

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Filed Aug. 3, 1961, Ser. No. 129,124
11 Claims. (Cl. 53—229)

My present invention relates to the packaging art and more particularly to a novel method and machine for packaging articles in a heat sealable film.

The principal object of the present invention is to provide a novel method and means for automatically and rapidly wrapping articles in a heat sealable film.

Another object of the present invention is to provide a method and means for wrapping articles in shrinkable film.

A further object of the present invention is to provide an apparatus for packaging items of different sizes and shapes in heat sealable film with a minimum of readily made adjustments.

Another object of the present invention is to provide a method and means for wrapping articles in a heat sealable film in the form of either a sleeve wrapper or a complete perimeter seal.

A further object of the present invention is to provide a means for packaging articles in a film of heat sealable material which is comparatively simple in construction and easy and economical to manufacture and assemble.

With the above and other objects and advantages and features in view my invention consists of a novel method and a novel machine more fully disclosed in the detailed description following in conjunction with the accompanying drawings and more particularly defined in the appended claims.

In the drawings,

FIG. 1 is a diagrammatic view of a machine for packaging in accordance with the present invention.

FIG. 2 is a side elevation of the rear end of the machine.

FIG. 2A is a side elevation of the front end of the machine.

FIG. 3 is a section taken on line 3—3 on FIG. 2.

FIG. 4 is a section taken on line 4—4 on FIG. 2.

FIG. 5 is a section taken on line 5—5 on FIG. 2A.

FIG. 6 is a detailed view of the front pusher assembly.

It has been found desirable to package items in a heat sealable film. A great deal of this packaging is done by hand especially where the shapes and sizes of the various articles vary considerably. Recently heat sealable films have been made in the form of shrinkable, biaxially oriented plastic films such as polyvinyl chloride, polyethylene, and polypropylene. These films can be produced to provide up to approximately a fifty percent shrinkage when heat is applied thereto. Such films permit an article to be initially loosely wrapped and then shrunk so that the film is reduced into intimate contact with the article. All these films have been used manually. The present invention is designed to produce a novel method and apparatus for rapidly packaging materials in a heat sealable film of any type including the shrinkable film.

The basic principle of the present invention provides for the feeding of the film from two separate sources positioned above and below the path of movement of the article being packaged. The two ends of film are heat sealed to each other to form a wall of film in vertical position in the path of movement of the article. Now when the article is pushed against this wall of film it will tend to drag sufficient film with it to form a sleeve around the article. The forward end is already sealed. Now a conventional cut off device is used in back of the article

which accomplishes three things. It seals the back end of the package, it severs the wrapped package from the film supply and it reseals the two free ends to reform the vertical wall of film for the next article. It is thus necessary for the successful practice of this method that the film be heat sealable. However, the separation of the film can be done with a conventional hot wire cut off device which both seals and cuts the film simultaneously, or it can be done mechanically with a knife or cold wire.

At this point the article has been wrapped in a sleeve of film open at each side. Many items such as fruits and vegetables should have a circulation of fresh air and no further sealing would be required. Where shrink film is used the article with its sleeve is passed through a hot air oven or tunnel for the required time, usually a matter of seconds. If it is desired to completely seal the package, the sides are heat sealed and the excess film is trimmed off. This can also be passed through the heat tunnel where shrink film is used.

FIG. 1 is a generally diagrammatic view of a machine for carrying out the method of the present invention. A roll of film **10** is mounted adjacent the rear of the machine in raised position above the level of the table **11** upon which the articles are placed. At a lower level a second roll of film **12** is mounted. The film from the roll **10** is passed through suitable tensioning devices and rollers to a point **13** positioned at the front of the table **11**. The film from the roll **12** is passed beneath the table **11** to a point **14** also at the front end of the table **11**. The points **13** and **14** are substantially in vertical alignment at a station **15** in the machine. To start the operation the two ends of film **10** and **12** are brought in contact with each other and heat sealed. There is now a vertical wall of film at the front end of the table **11**. An article placed on the table **11** either manually or automatically is pushed forwardly through the station **15** to the position **16** on the other side of the station **15**. The article itself will drag sufficient film with it for wrapping. A transverse sealer and cutter is mounted in the station **15** and this severs the two layers of film while simultaneously sealing both sides of the cut so that the article is now wrapped in a sleeve and the wall of film has been rejoined ready for the next article. After the conclusion of this operation the package is moved from the position **16** to position **17** which includes a pair of heat sealing devices for sealing and trimming the side edges. This station **17** can be omitted where only a sleeve is desired. The items is now properly wrapped. However, where shrinkable film is used a heat tunnel **18** may be mounted on a base **19** at the front end of the machine. Movement of the package progressively through the various stations and the heat tunnel may be provided by belts, retractable pushers or any other means. Also, the length of time for stopping at each station may be controlled mechanically or electronically.

The above method permits the packaging of varying sizes of articles with very little adjustment. The table **11** provides that the pusher move the rear portion of the article through the station **15**. The larger the article the more film it will drag with it. No adjustment is necessary at this point. The stopping point **16** may be vertically adjusted to compensate for different thicknesses of articles. The side sealers **17** may be adjusted inwardly for different widths of articles. This simple method and apparatus therefore permits a great variety of articles to be rapidly packaged in either a sleeve or a complete perimeter seal and with either regular or shrinkable film. The only requirement is that the film be heat sealable.

A machine for carrying out the above described method is disclosed in more detail in FIGS. 2 to 5 inclusive. Referring to FIGS. 2 and 3, the left end of the machine shown in FIG. 2 is actually the rear of the machine. It

comprises a table or base 20 which may be suitably mounted on supports or legs in any desired manner. Mounted above the table 20 and spaced forwardly from the rear of the machine are a pair of side plates 21 extending upwardly at each side edge. The plates 21 act as supports for the various rollers and drives for feeding the upper roll of film 22. Adjacent the top rear edge of the supporting plates 21 are a pair of spaced parallel rollers 23 and 24. The roll of film is mounted for support on the rollers 23 and 24 and is not otherwise supported. The rear roller 23 is motor driven to form a positive feed for the film 22. A third roller 25 is mounted in substantially horizontal alignment with the rollers 23 and 24 but forwardly thereof. Where a static eliminator is desirable, it may be located in the area of the roller 25. Mounted below the rollers 23 and 24 is a transverse bar 26 upon which a pair of levers 27 are pivotally mounted. Also mounted on bars 26 are counter balancing weights 28 which are angularly adjustable. The elongated front ends of the levers 27 support a roller 29. This pivoted construction provides a "dancing bar" for adjustably controlling the tension on the film. As the film leaves its roll 22 it passes forwardly and over the roller 25, then downwardly and around the dancing roller 29 then back upwardly and over a fixed roller 30 which is mounted on a pair of forwardly extending arms 31 which extend from the side plates 21. From this point the film 22 is fed horizontally to the first stage of the apparatus.

The second roll of film 32 is mounted rearwardly and below the first roll of film as shown in FIG. 2. The feeding of the film 32 is accomplished in a manner identical with the feeding of the film 22. The roll of film 32 is positioned on a pair of spaced rollers 33 and 34, with the roller 33 being driven. The roller 35 is mounted forwardly of the roller 34. A second static eliminator may be positioned in this area. A lever 36 is pivotally mounted at 37 to support the dancing roller 38. The film 32 is fed over the rollers 34 and 35, down and under the roller 38 and up and over the roller 39 mounted just below the table level 20. The film 32 then passes horizontally forwardly to the first stage of the apparatus.

Mounted on the base 20 forwardly of the film feeds is a table 40. Adjustably mounted below the upper level of the table is a microswitch 41 having an operating arm 42 extending above the level of the table. An adjustable pusher plate 43 is mounted on an arm 44 which extends upwardly through a slot 45 longitudinally of the table 40. The arm 44 is mounted on a horizontal bar 46 extending laterally to the side of the device as shown in FIG. 3. The outer end of the bar 46 is attached to a slide member 47 which is longitudinally slidable on vertically spaced horizontal shafts 48 and 49 shown in dotted lines in FIG. 2. An air or hydraulic cylinder 50 is mounted in the rear portion between the shafts 48 and 49 with its piston 51 attached to the slide member 47. As illustrated in FIG. 2 the slide member is in its extreme forward position. When the cylinder 50 is actuated so that the piston 51 moves to the left the slide member 47 is pulled rearwardly and the arm 44 and pusher plate 43 are also moved to the rear portion of the table 40. When an article to be wrapped is placed on the table 40, either manually or with an automatic feed, it will deflect the operating arm 42 of the microswitch 41 to start the cycling of the machine and cause the cylinder 50 and piston 51 to move forwardly moving the pusher arm 44 and plate 43 into the position shown in FIG. 2. The stroke of the cylinder is always the same regardless of the size of the article to be wrapped. Since the pusher arm engages the back edge of the article, the back edge of the article will always come to rest in the same location regardless of the length of the article. This serves to locate the article in correct position for the first sealing operation.

Now referring to FIGS. 2 and 4, the first operating station comprises a pair of vertical supports 52 mounted at each side edge of the table 20. The upper rear portion

of the supports 52 are provided with arms 53 supporting a roller 54 over which the upper film 22 passes. The lower film 32 passes around the roller 55 mounted forwardly of the table member 40 and below its upper edge. The films 22 and 32 extend towards each other and their edges are heat sealed to provide a substantially vertical unitary film in the path of horizontal movement as shown in dotted lines at 56 in FIG. 2. Now mounted between the supports 52 is a lower fixed roller 57 in horizontal alignment with the top of the table 40. Mounted vertically to the roller 57 is a vertically adjustable roller 58. The distance between rollers 57 and 58 is adjusted to accommodate the height of the package to be wrapped. Mounted between the supports 52 and just forwardly of the roller 57 is the lower element 59 of a heat sealing and cut off device. While any type of mechanism may be employed the illustrated form shows a thermal impulse type of sealer. The element 59 has an upper surface designed to withstand heat and to prevent the film from sticking to it. The upper portion of the unit comprises a transverse heat sealing and cutting portion 60 which is mounted on a vertical shaft 61 attached to the operating piston of a cylinder 62. At the front portion of the supports 52 are a pair of vertical rods 63 at the lower end of which are pivotally mounted a friction braking member 64 designed to ride the top of the package and to prevent its displacement.

Now referring to FIG. 2, a package 65 had been positioned on the table 40 and tripped the actuating switch 41. Operation of the cylinder 50 has now caused the pusher arm 44 and plate 43 to push the article 50 through the wall of film 56 into the position shown in FIG. 2. It will be noted that the article 65 has dragged the film between the rollers 57 and 58. This film is pulled from the reservoir of film between the rollers 25 and 30 and dancing roller 29 on the upper film and the rollers 35 and 39 and the dancing roller 38 on the lower film. As the dancing rollers are pulled upwardly to release the film they will contact microswitches to operate the rollers 23 and 33 to feed additional film and allow the rollers to drop back to the positions shown in FIG. 2 ready for the next operation. By adjusting the angular position of the weights 28, the tension on the film can be adjusted to the optimum level.

The lower film is over the top edge of the die member 59. The cylinder 62 is now actuated and the cutting and sealing unit 60 now comes downwardly and contacts the upper film 22 first and pushes it against the lower film 32 and on top of the die member 59. An electrical impulse through the upper element 60 now does three things. It seals the upper and lower films to the right, thus sealing the package at the rear edge. It seals the upper and lower films to the left thus reforming the wall of film 56 for the next package. It cuts through the films between the two seals severing the package from the films. At this point a sleeve has been formed longitudinally around the package 65. In many instances this may be all that is required. If the film is a shrink film then the package with the sleeve must be passed through the shrink tunnel illustrated in FIG. 2A. However if the package is to be provided with a perimeter seal then it must be passed through the portion of the apparatus illustrated to the right in FIG. 2 and in FIG. 5.

The package is supported in the position shown in FIG. 2 on spaced strips 66 which are normally mounted with their upper edges in horizontal alignment with the top of the table 40. This means that the seal and cut off will be made at the bottom rear edge of each package. However, if the package is relatively thick it may be desirable to form the seal closer to the center of its height. In such cases the supporting strips 66 are dropped a sufficient distance as shown in FIG. 2. Each supporting strip 66 is supported on each end by a vertical shaft 67 which is pivotally attached to an L-shaped rocker arm 68 pivoted at 69. The other leg of the rocker arm 68 is attached to a shaft 70 having its end in threaded engagement with an adjustment bolt 71 having a crank wheel 72.

Rotation of the wheel **72** moves the shaft **70** axially. This pivots the rocker arm **68** and moves the shaft **67** vertically to make the proper adjustment.

On each side edge, is a vertical supporting post **73** having an inwardly extending ledge **74** on which a cut off die member **75** is mounted. The members **75** are identical with the member **59**. Above each member **75** is a thermal impulse sealing and cut off unit **76** mounted on a shaft **77** and operated by a vertical air cylinder **78**. The units **76** are identical with the unit **60**. The units **76** are provided with laterally extending guide rollers **79** contacting the vertical surfaces **80** on the supports **73**. When the package **65** is moved between the supports **73** the excess film at each side edge overlies the members **75**. The units **76** now move downwardly and cut the excess film and simultaneously complete the perimeter seal of the package. The package **65** has now been sealed on four sides and where standard film is used the package is complete. Where shrink film is used it must be passed through the shrink tunnel.

The cut off and sealing units at each side edge must be adjusted to the width of the package. As illustrated in FIGS. 2 and 5, each supporting post **73** is mounted on a pair of spaced horizontal guide bars **81** at the bottom edge. A shaft **82** is mounted transversely of the machine between the guide bars **81** and is provided with oppositely pitched threads on each side. The shaft **82** threadedly engages the bottom of each support **73**. An operating handle **83** extends from one end of the shaft **82** and rotation of the handle **83** will cause the supports **73** to move towards or away from each other. The strips **66** are supported on collars **84** through which a similar shaft **85** extends so that rotation of the shaft **85** moves the collars **84** toward and away from each other. This is done to ensure a support for a narrow package. A sprocket chain **86** connects the center of the shafts **82** and **85** so that when the shaft **82** is rotated to adjust the posts **73**, the shaft **85** will also rotate to adjust the strips **66** a corresponding amount.

Movement of the package **65** from the table **40** to the position shown in FIG. 2 is accomplished by the pusher plate **43** powered by the cylinder **50** and piston **51**. Each package must be moved in timed sequence from the position shown in FIG. 2 to a position between the supports **73** for the sealing and cut off operation by the units **76**. Then the package must be cleared off the front end of the machine. The last two movements of the package are accomplished by the assembly illustrated in FIGS. 2, 3, 5, and 6.

A pair of spaced parallel guide bars **87** are mounted below the strips **66**, passing on the inside of the collars **84** as shown in FIG. 5. A plate **88** is slidably mounted on each guide bar **87**. A pair of lever arms **89** and **90** are pivotally mounted on each plate **88** and extend in opposite directions horizontally from the plate **88**. The inner ends of the lever **89** and **90** are provided with interengaging gear teeth **91**. The lever **90** is provided with a depending arm **92** which forms a bell crank arrangement. The outer ends of the levers **89** and **90** are provided with vertical pusher arms **93** and **94**. The bottom end of each arm **92** is pivotally connected to a push rod **95**. The rear end of each push rod **95** is connected to a support **96** mounted on a transverse arm **97** which is connected to the slide member **47**, see FIG. 3.

Now, when the slide member **47** has been moved forwardly into the position shown in FIG. 2, the push rods **95** will have pushed the arms **92** forwardly until they abut stops **98** in the plates **88**. This movement of the arms **92** causes the interengaged ends **91** of the levers **89** and **90** to move downwardly, thus lifting the outer ends and the pusher arms **93** and **94**. On the return stroke, the rods **95** will pull the arms **92** to the left (FIG. 6) until they abut the stops **99**. This will raise the ends **91** of the levers **89** and **90** and will drop the outer ends below the level of the strips **66**. The levers **89** and **90** are of

such length that in retracted position the pusher arms **93** on the levers **89** will be located below and between the rear end of the package **65** and the member **59** (FIG. 2), and the pusher arms **94** on the levers **90** will be below and behind the package proviously pushed between the supports **73**. As the rods **95** start forwardly, the levers **89** and **90** are lifted. The pushers arms **93** swings upwardly behind the package **65** (FIG. 2) and push it between the supports **73**. At the same time, the pusher arms **94** swing upwardly behind the package previously pushed between the supports **73**, and push the package from the front of the machine.

The above described machine can be used for both sleeve and perimeter packaging by merely deactivating the members **76** when only a sleeve is required. In either case where a shrink film is used a shrink tunnel is coupled with the machine as shown in FIG. 2A. The various shrinkfilms require approximately three or four seconds in hot air to affect the desired shrinkage. The shrink tunnel is therefore merely a support **100** having a plurality of individually driven rollers **101**, driven by a chain **102** from a motor **103**. The rollers **101** are driven at the proper speed to retain the package the desired time in the tunnel **104**. The tunnel **104** straddles the rollers **101** at one end and is provided with a flexible curtain (not shown) to allow the package to enter and leave without losing the hot air. These shrink tunnels can be purchased in different convenient constructions to accomplish the same end. The rear end of the support **100** is connected by auxiliary strips **105** with the strips **66** so that there is a continuous smooth movement of the package.

Operation of the machine is simple. The rolls of film **22** and **32** are threaded through the various rollers as shown in FIG. 2 and their ends are heat sealed to form the curtain of film **56**. An article is placed on the table **40**, either manually or by any conventional feed mechanism. The switch **41** is activated by the article and the pusher plate **43** pushes the article into the position shown in FIG. 2, dragging sufficient film with it to wrap the article. The plate **43** starts to retract, and as soon as it has cleared the supports **52**, the member **60** descends and severs the films while simultaneously sealing the sleeve around the article and resealing the cut ends of the film to reform the curtain of film **56**. The plate **43** now starts a second stroke with another article. Simultaneously, the pusher arms **93** engage the article with the sleeve and also push it between the supports **73**. Now as the second article is being sealed at the first position (FIG. 2), the first article is being side sealed by the members **76**. On the third and succeeding strokes of the piston **51**, the pusher plate **43** will move an article into the position shown in FIG. 2, the arms **93** will push an article from this position to between the supports **73**, and the arms **94** will push the completely sealed article from the front of the machine and onto the shrink tunnel rollers where required.

When adjustments are made for the height of the package, the vertical strokes of the cylinders **62** and **78** are also adjusted to minimize the cycle time of the machine. Also, where shrink film is used with a perimeter seal, it is desirable to perforate the package to permit the entrapped air to escape during shrinking. For this purpose any conventional hole punching device may be positioned adjacent either or both rolls of film.

The movement of the cylinder **50** which operates the pushing devices, the operation of the cylinder **62** which handles the cut off and seal and the operation of the cylinders **78** which handle the side cut off and seal must be in timed sequence. For this purpose any type of mechanical or electronic control mechanism may be used. For example in FIG. 2 the pushing plate **43** is illustrated at its extreme forward thrust. This means that it must be retracted before the cylinder **62** is actuated for the first cut off and seal. In other words the pushing mechanism must be moved out of the way before the seal descends.

The action is rapid, the machines made in accordance with this invention being capable of producing packages at speeds in excess of 2000 per hour.

The mechanism thus provides for a controlled feed of an upper and lower supply of film joined to form a vertical continuous wall of film. The forward motion of the package through this wall is designed to pick up sufficient film to wrap the package. By sealing, cutting and reforming the wall of film the machine can be readied for the next package and the sleeve formed on the original package can be left open or sealed at the sides. The shrink tunnel can be easily attached in cases where shrink film is used.

The machine is versatile. No dies are required to fit particular packages. Adjustment is readily made to accommodate different widths and heights and the same machine will handle a virtually unlimited variety of articles. It is simple and relatively inexpensive. It provides a low cost machine with a great deal of flexibility as to package size and shape at a relatively high speed normally provided only by complex machines costing much more. Other advantages of the present invention will be readily apparent to a person skilled in the art.

I claim:

1. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said film being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, said pushing means comprising a plate slidably mounted for longitudinal reciprocation at one side of said support, a bar mounted on said plate and extending transversely beneath said table, said table having a longitudinal slot, a pusher arm extending vertically from said bar through said slot, and an adjustable pusher plate mounted on said pusher arm, a pair of vertically spaced parallel shafts mounted at one side of said support, said slidable plate being mounted on said shafts, a pneumatic cylinder mounted behind said slidable plate, and a piston rod extending from said cylinder and engaging said slidable plate.

2. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, and means for applying heat to said sealed article to shrink said film around the article, and means for pushing said article from said transverse sealing means to said side edge sealing means and from said side edge sealing means to said heat applying means, said last named pushing means comprising a pair of plates slidably mounted in spaced parallel relation on said support, a pair of levers pivotally mounted on each of said plates and extending longitudinally in opposite directions beneath said support, the inner ends of said levers having interengaging gear teeth, one of said levers having a depending arm, a push rod connecting said arm to said table pushing means, and a vertically extending pushing arm mounted at the outer end of each of said levers.

3. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, spaced parallel strips for supporting the article from in front of said table to the front of said support, and means for adjusting the height of said supporting strips, said height adjusting means comprising a vertical support adjacent each end of each of said strips, a bell crank lever pivotally mounted beneath each of said supports, one arm of said lever engaging the bottom of said support, a shaft extending beneath each strip in spaced parallel relation thereto, the other arm of each lever being in threaded engagement with said shaft, and a manually engageable wheel at one end of said shaft for rotating said shaft.

4. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, spaced parallel strips for supporting the article from in front of said table to the front of said support, and means for transversely adjusting said strips and said side edge sealing means, said transverse adjusting means comprising a shaft mounted transversely of said support, said shaft having oppositely pitched threads from the center outwardly, a collar threadly engaging said shaft at each end, said strips being mounted on said collars, a second shaft mounted in spaced parallel relation to said first shaft, said second shaft having oppositely pitched threads from the center outwardly, said side edge heat sealing means engaging the threads of said second shaft, a sprocket chain connecting said shafts for simultaneous rotation, and means for manually rotating said second shaft.

5. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper

around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, and means for applying heat to said sealed article to shrink said film around the article, and means for pushing said article from said transverse sealing means to said side edge sealing means and from said side edge sealing means to said heat applying means, said upper and lower dispensing means each including a pair of spaced parallel rollers for supporting a roll of film, one of said rollers being motor driven, and means for adjustably applying a tension to said continuous lengths of film, said adjustable tensioning means comprising a rotatable bar, a pair of spaced levers mounted on said bar, a roller extending between the ends of said levers, said film passing under said roller, and a radially adjustable weight mounted on said bar adjacent each of said levers.

6. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, said pushing means comprising a plate slidably mounted for longitudinal reciprocation at one side of said support, a bar mounted on said plate and extending transversely beneath said table, said table having a longitudinal slot, a pusher arm extending vertically from said bar through said slot, and an adjustable pusher plate mounted on said pusher arm, a pair of vertically spaced parallel shafts mounted at one side of said support, said slidable plate being mounted on said shafts, a pneumatic cylinder mounted behind said slidable plate, and a piston rod extending from said cylinder and engaging said slidable plate, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article.

7. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said film being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, said pushing means comprising a plate slidably mounted for longitudinal reciprocation at one side of said support, a bar mounted on said plate and extending transversely beneath said table, said table having a longitudinal slot, a pusher arm extending vertically from said bar through said slot, and an adjustable pusher plate mounted on said pusher arm, a pair of vertically spaced parallel shafts mounted at one side of said support, said slidable plate being mounted on said shafts, a pneumatic cylinder mounted behind said slidable plate, and a piston rod extending from said cylinder and engaging said slidable plate, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, and means for applying heat to said sealed article to shrink said film around the article, and means for pushing said article from said transverse sealing means to said side edge sealing means and from said side edge sealing means to said heat applying means, said last named pushing means comprising a pair of plates slidably mounted in spaced parallel relation on said support, a pair of levers pivotally mounted on each of said plates and extending longitudinally in opposite directions beneath said support, the inner ends of said levers having interengaging gear teeth, one of said levers having a depending arm, a push rod connecting said arm to said table pushing means, and a vertically extending pushing arm mounted at the outer end of each of said levers.

8. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, spaced parallel strips for supporting the article from in front of said table to the front of said support, and means for transversely adjusting said strips and said side edge sealing means, and means for adjusting the height of said supporting strips.

9. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, spaced parallel strips for supporting the article from in front of said table to the front of said support, and means for transversely adjusting said strips and said side edge sealing means, and means for adjusting the height of said supporting strips, said height adjusting means comprising a vertical support adjacent each end of each of said strips, a bell crank lever pivotally mounted beneath each of said supports, one arm of said lever engaging the bottom of said support, a shaft extending beneath each strip in spaced parallel relation thereto, the other arm of each lever being in threaded engagement with said shaft, and a manually engageable wheel at one end of said shaft for rotating said shaft.

10. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simulta-

neously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, spaced parallel strips for supporting the article from in front of said table to the front of said support, and means for transversely adjusting said strips and said side edge sealing means, and means for adjusting the height of said supporting strips, said transverse adjusting means comprising a shaft mounted transversely of said support, said shaft having oppositely pitched threads from the center outwardly, a collar threadedly engaging said shaft at each end, said strips being mounted on said collars, a second shaft mounted in spaced parallel relation to said first shaft, said second shaft having oppositely pitched threads from the center outwardly, said side edge heat sealing means engaging the threads of said second shaft, a sprocket chain connecting said shafts for simultaneous rotation, and means for manually rotating said second shaft.

11. A machine for wrapping articles in heat sealable film comprising a support, a table mounted on said support, means on said support for dispensing a continuous length of film above said table, means on said support for dispensing a second continuous length of film below said table, the free ends of said films being initially joined to form a curtain of film extending vertically in front of said table, means for pushing an article from said table against said curtain of film whereby the article will drag sufficient film with it to wrap the article, and means mounted transversely on said support for simultaneously heat sealing said films to form a sleeve wrapper around the article, severing said sleeve wrapper from said films, and heat sealing the severed ends of said films to reconstitute the curtain of film, and means for heat sealing the side edges of said sleeve to form a perimeter seal around the article, spaced parallel strips for supporting the article from in front of said table to the front of said support, and means for transversely adjusting said strips and said side edge sealing means, and means for adjusting the height of said supporting strips, said height adjusting means comprising a vertical support adjacent each end of each of said strips, a bell crank lever pivotally mounted beneath each of said supports, one arm of said lever engaging the bottom of said support, a shaft extending beneath each strip in spaced parallel relation thereto, the other arm of each lever being in threaded engagement with said shaft, and a manually engageable wheel at one end of said shaft for rotating said shaft, said transverse adjusting means comprising a shaft mounted transversely of said support, said shaft having oppositely pitched threads from the center outwardly, a collar threadedly engaging said shaft at each end, said strips being mounted on said collars, a second shaft mounted in spaced parallel relation to said first shaft, said second shaft having oppositely pitched threads from the center outwardly, said side edge heat sealing means engaging the threads of said second shaft, a sprocket chain connecting said shafts for simultaneous rotation, and means for manually rotating said second shaft.

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