June 23, 1970 P. J. FELLNER 3,516,228

APPARATUS FOR WRAPPING WITH FLEXIBLE HEAT SEALABLE MATERIAL

Filed Feb. 26, 1968 3 Sheets-Sheet 1

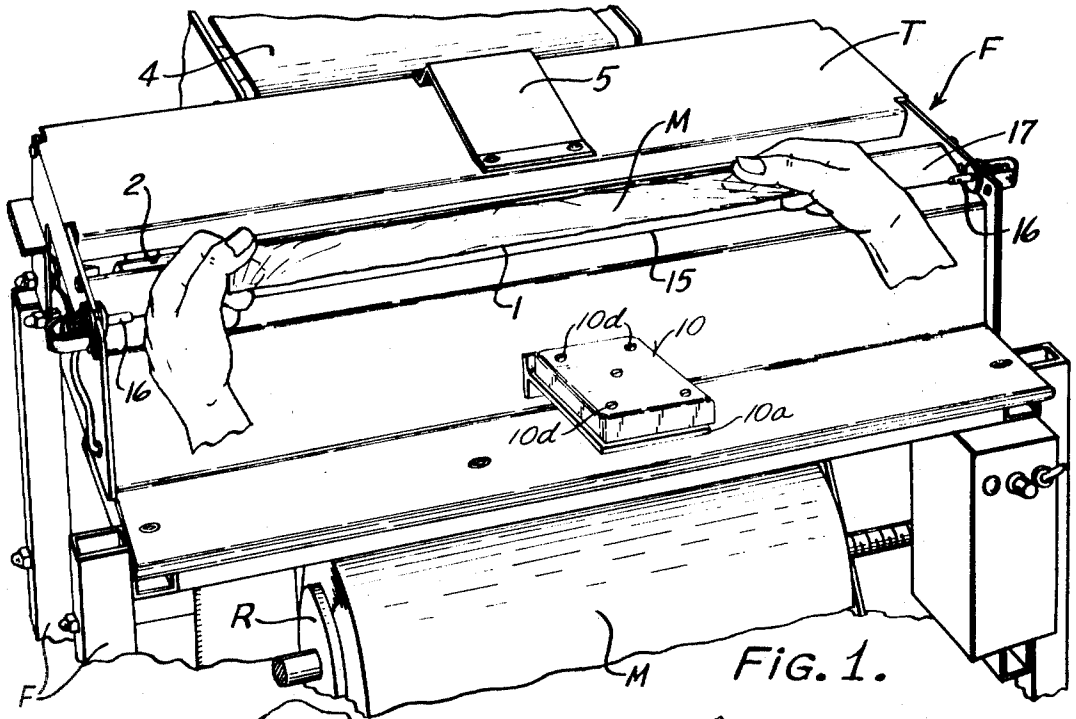


FIG. 1.

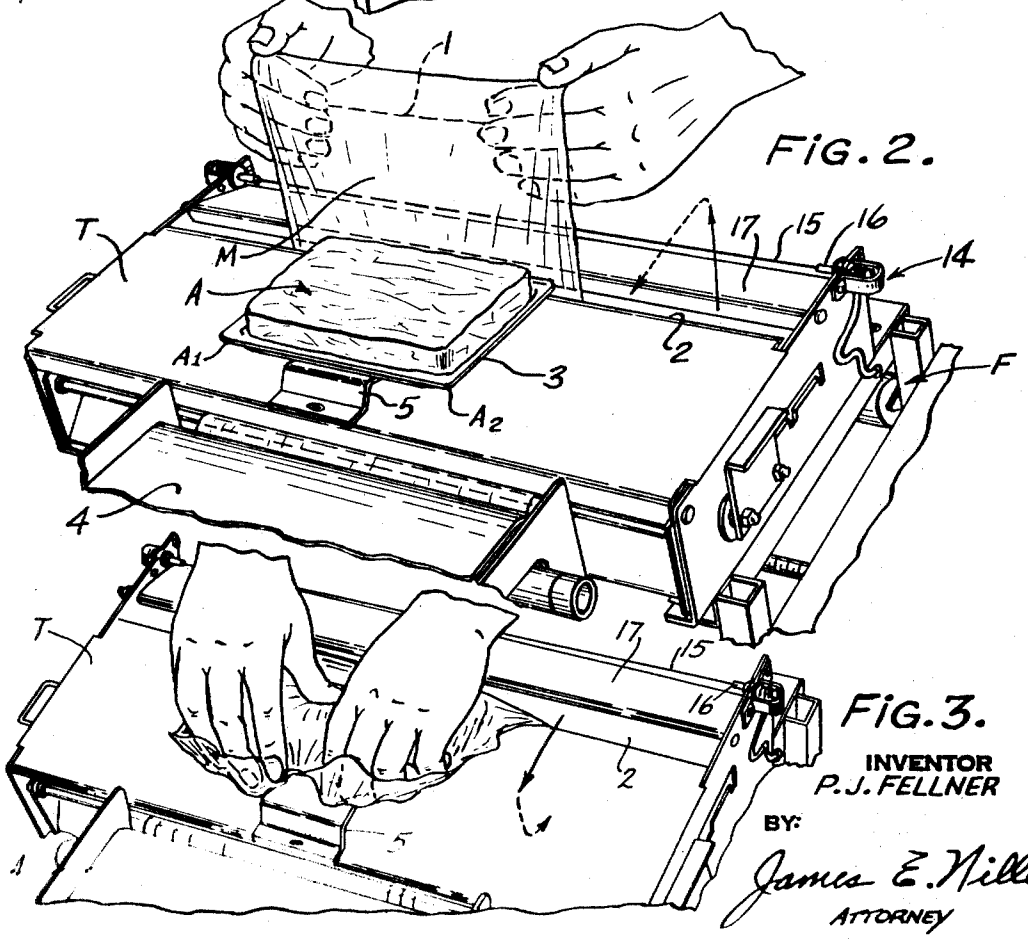


FIG. 2.

FIG. 3.

INVENTOR
P. J. FELLNER

BY:
James E. Nilles
ATTORNEY

June 23, 1970 P. J. FELLNER 3,516,228

APPARATUS FOR WRAPPING WITH FLEXIBLE HEAT SEALABLE MATERIAL

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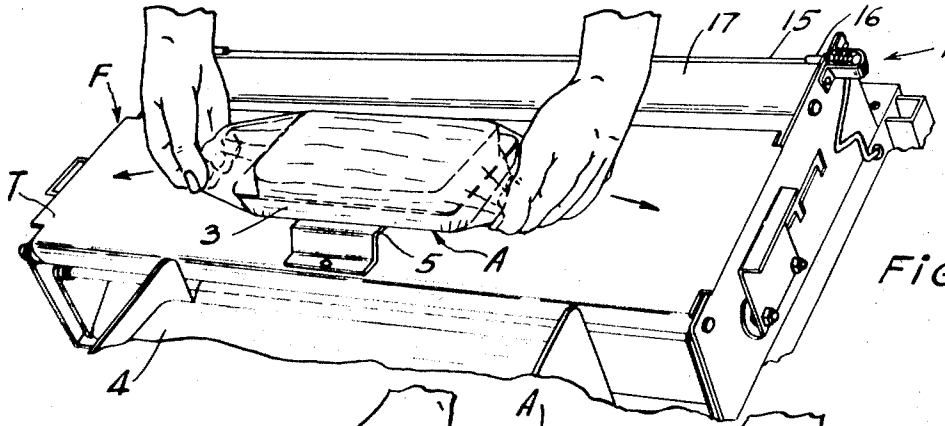


FIG. 4.

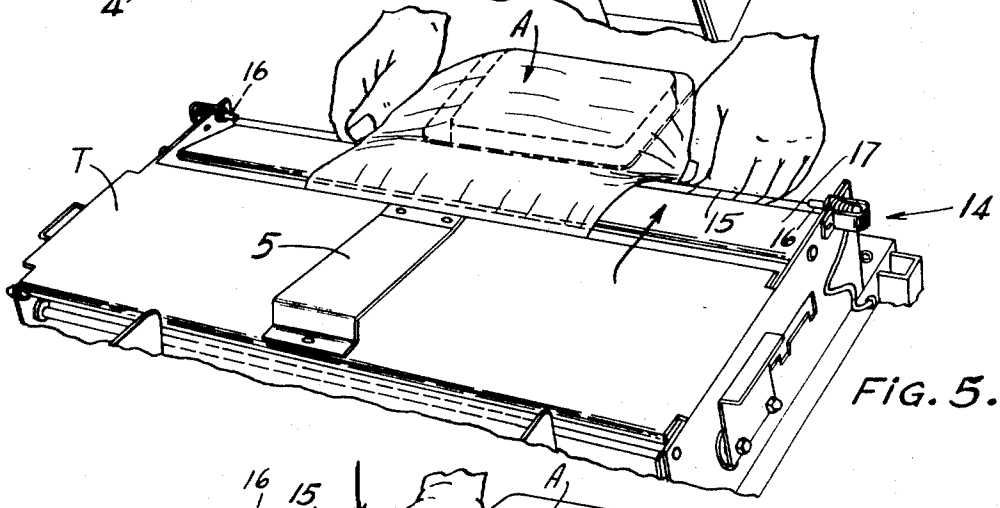


FIG. 5.

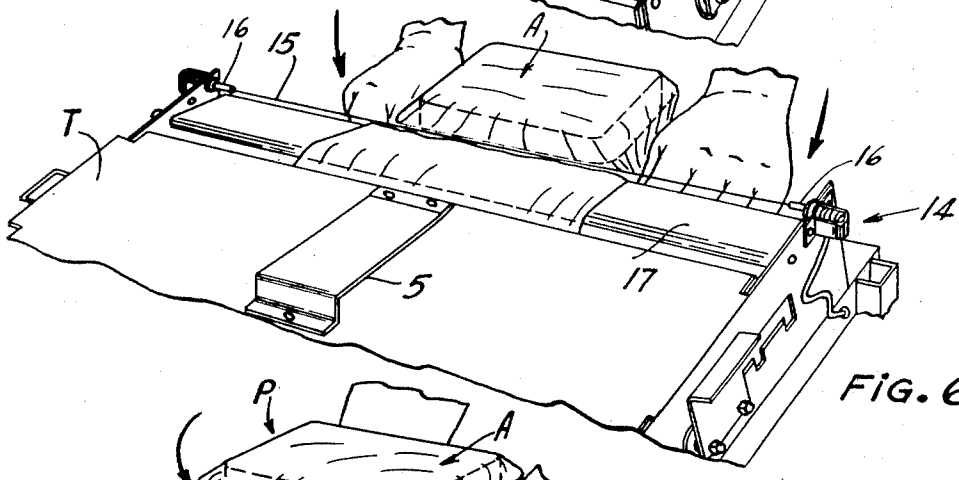


FIG. 6.

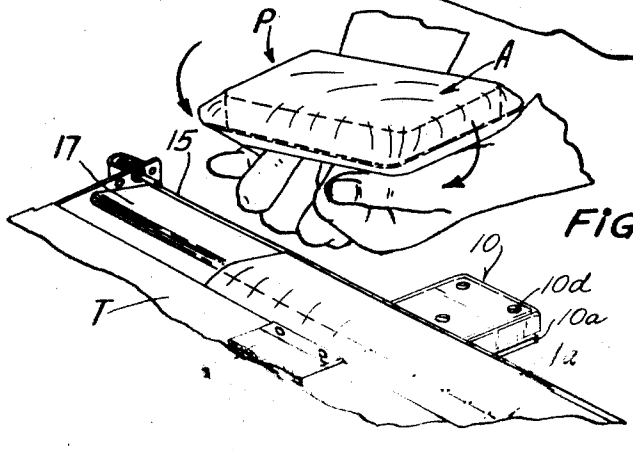


FIG. 7.

INVENTOR
P.J. FELLNER

BY:

Cameron E. Milles

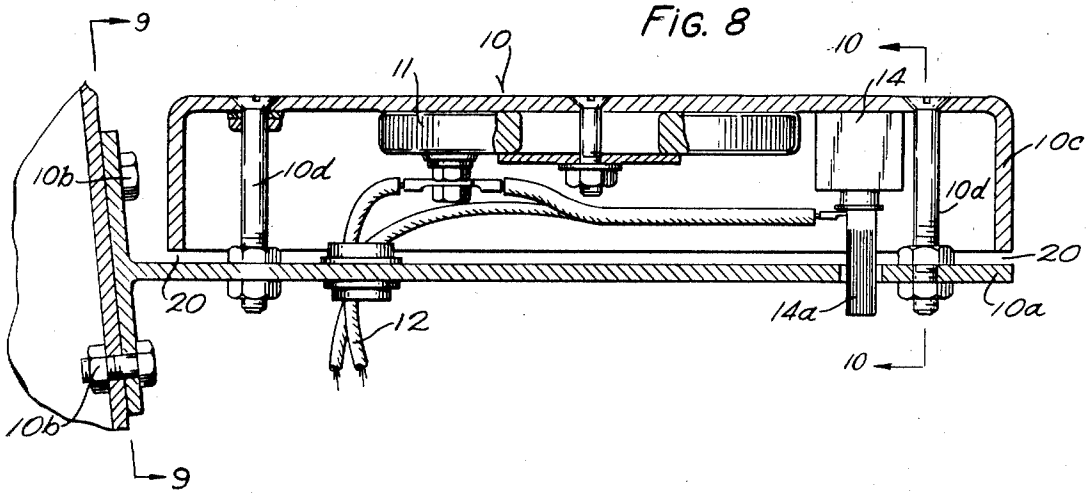
ATTORNEY

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APPARATUS FOR WRAPPING WITH FLEXIBLE HEAT SEALABLE MATERIAL

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FIG. 8



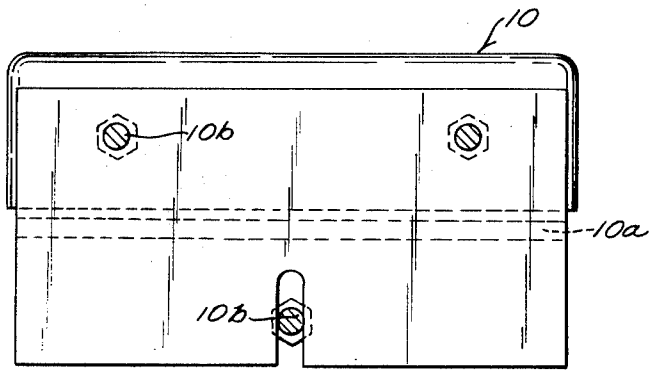
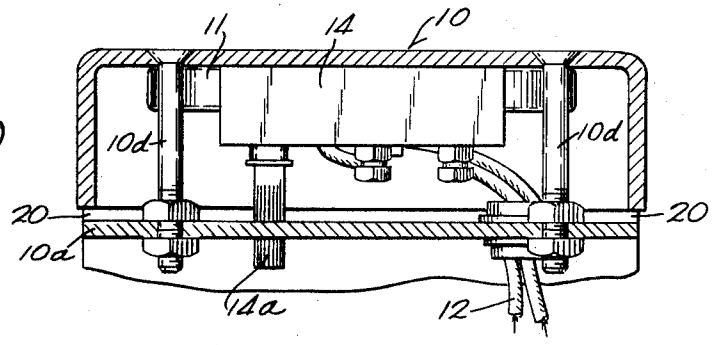


FIG. 9

FIG. 10



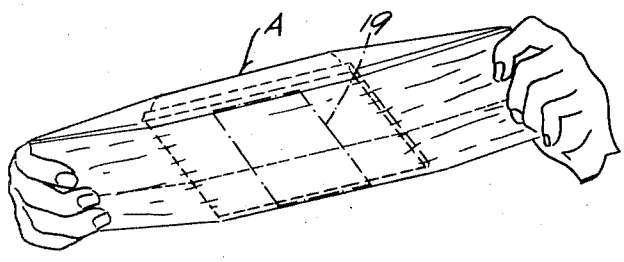


FIG. 11

INVENTOR:
P. J. FELLNER
BY: James E. Nilles
ATTORNEY

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3,516,228

APPARATUS FOR WRAPPING WITH FLEXIBLE HEAT SEALABLE MATERIAL

Phillip J. Fellner, Racine, Wis., assignor to Sturtevant Industries, Inc., Sturtevant, Wis., a corporation of Wisconsin

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Int. Cl. B65b 67/08
U.S. Cl. 53—390 1 Claim

ABSTRACT OF THE DISCLOSURE

Apparatus including a heated support pedestal for and method of wrapping an article to permit the soft, flexible wrapping material to be pulled tightly and completely around all sides of the article and also underneath the article so as to "band" it with the material with the sides of the band extending laterally outwardly at opposite sides, then the bottom of the band is sealed tightly at the bottom thereof, and the sides then tucked smoothly and tightly across the bottom and the folded sides heat sealed across the bottom of the completed package, all with one general sweeping motion in a matter of a few seconds.

Brief description of the invention

The invention relates to and provides an aid for and method of manual packaging of an article or filled receptacle with soft, flexible, thermoplastic material by drawing the material from a roll and completely overwrapping the article, placing the article on a pedestal and substantially simultaneously cutting the partially wrapped article free from the remainder of the rolled material by means of an advantageously positioned hot wire, and also simultaneously sealing the bottom of the band of material across the bottom, and then stretching and pulling the outwardly extending ends of the wrapping material tightly downwardly over the edges of the article and under it to completely and tightly wrap the article regardless of its shape. The wrapping process is all done without the necessity of at any time releasing or losing hold of the wrapping material.

The introduction of soft or Pliofilm material into the food wrapping industry has resulted in a number of objectionable features in the use of such material. It has been found that due to its ready adherence to any surface, and particularly to itself, it must be supplied in rolls rather than cut sheets as previously supplied. When wrapping by hand, it must be used as it is unrolled from the roll in order to eliminate handling problems. Wrapping equipment has been developed which enables an operator to pull out a predetermined length of paper, overwrap and underwrap the article by moving it toward the operator and automatically cutting the sheet of material as it is moved toward the operator. The outwardly extending edges of the wrapping material are tucked under by hand and the package placed on a hot plate to seal the bottom of the package. The outwardly extending ends may be pulled across the bottom of the package if the operator holds the package in his hand and folds one end at a time. Such prior art apparatus is shown generally in the U.S. Pat. No. 3,176,443, which issued on Apr. 6, 1965, to William Klamp, and over which the present invention is an improvement.

The present invention is in the nature of an improvement over the subject matter of the U.S. Pat. No. 3,358,420, issued Dec. 19, 1967, to Fellner et al. The present invention provides for sealing the bottom of the band of wrapping material before the laterally extending sides of the partially formed package have been pulled toward one another under the article to complete the wrap. As

a result of the present invention, a much tighter and more smoothly finished package is provided.

Summary of the invention

Generally, the invention provides improved apparatus for and method of wrapping an article in soft, Pliofilm, heat sealable material which are very fast and simple in operation and tightly and completely wraps the article of varying configurations, and which permits the quick and easy wrapping of the material against the bottom of the package, assuring a positive heat seal across the bottom edges and before the entire bottom is subsequently heat sealed.

With the present invention, there is no possibility of the partially wrapped package becoming loose before the final wrapping operation and final heat seal. Also no bunching of the wrapping material on the bottom of the package occurs, and a smooth and flat bottom of the finished package is assured and one having a good seal.

Brief description of the drawings

FIG. 1 is a perspective view of the apparatus made in accordance with the present invention, the view being taken from the operator's side, certain parts shown as being broken away;

FIGS. 2 to 7 are fragmentary, perspective views, taken from the side opposite to that shown in FIG. 1, and showing the series of steps in wrapping an article in accordance with the present invention;

FIG. 8 is a side, elevational view, on an enlarged scale, of the second support shown in FIG. 1, certain parts shown in section or broken away for clarity;

FIG. 9 is a sectional view taken along line **9—9** in FIG. 8;

FIG. 10 is a sectional view taken along line **10—10** in FIG. 8; and

FIG. 11 is a perspective view of the partially wrapped article after the first heat seal across the bottom has been made on the wrapper band formed at that stage in the wrapping process.

Preferred embodiment of the invention

The wrapping apparatus provided by the present invention includes a frame F supported on the floor or other convenient surface, which frame has an upper end, which may include a table top T, located at a height convenient to the opeartor. A number of rolls R (only one shown) of soft Pliofilm material M may be rotatably supported on the lower portion of the frame whereby a particular type or width of roll may be selected for drawing material therefrom. The material M is drawn up by its free end **1** through the laterally extending passage **2** in the upper end of the frame. The article, which may be in a tray **3**, is then wrapped by the operator and placed on the heated conveyor **4** located adjacent the apparatus whereby the conveyor acts to heat seal the bottom of the completed package.

For convenience of description, the side of the apparatus toward the operator will be referred to as the rear side, while that remote from him, the front side. The other two opposite sides may be characterized as the lateral sides.

The articles to be wrapped are fed to the apparatus by an endless conveyor or other means (not shown), and in wrapping operations of this character, extreme speed of wrapping is important. With the present invention, an article can be wrapped in an extremely simple, fast and easy manner.

Referring more specifically to the wrapping apparatus, a first support **5** is provided adjacent the upper end of the frame and is of a width less than that of the article A so that when the article A is placed thereon, the lateral sides A1 and A2 of the article extend laterally beyond the width

of the first support. The support is shown as a plate member which is inclined at an angle which extends upwardly in a direction away from the operator. The support **5** is thus elevated or positioned to provide clearance beneath the article, when resting on the support, to enable the operator's finger to easily move under the article.

Prior to commencing the wrapping operation, the wrapping material, which is very adhesive to itself or anything it comes in contact with, extends upwardly through the passage **2** and has its free end **1** resting on the top of the table adjacent the operator whose hands only are shown. This is the position the edge assumed after the termination of the previous wrapping operation.

To commence the wrapping operation, the operator would insert his fingers into the passage **2** at either side of the material M (FIG. 1), then grasp the material adjacent its free leading edge **1** and lift it upwardly (FIG. 2) a sufficient distance so that when he then moves the free end of the wrapping material over the article (FIG. 3), it is sufficiently long to extend completely around the front edge of the article which is located remote from the operator.

In FIG. 3 it will be noted the material is being rolled around the front edge of the package by the operator's fingers so that the wrapping material completely and smoothly covers the entire length of the forward edge of the article (FIG. 4) and the operator's hands are then located one on each side of the article, still firmly grasping the wrapping material and pulling it laterally tautly over the article. The tension of the wrapping material from the roll R has been such that the operator has also tightly stretched the material over the article in the general sweeping motion away from himself and then back underneath the forward edge of the article. Because of the fact that the article A extends laterally to each side of the support **5** and has clearance underneath, the operator can, with one smooth sweeping motion, completely overwrap the material and locate the leading edge **1** of the material under the article A without bunching of the wrapping material.

The operator then moves the article toward himself and, as shown in FIG. 5, has placed it on a second support **10** located adjacent the rear or operator's side of the apparatus. It will be noted that the support **10** is formed as a pedestal and is also of a width considerably less than the article to be wrapped so that the article, now in the partially wrapped form, extends laterally over either side of the second support. The second support **10** is also elevated sufficiently so that adequate clearance is provided thereunder for the operator's hands as will presently appear. When in the position shown in FIG. 5, the operator moves his hands laterally outward from one another, tautly stretching the wrapping material laterally over both the top and bottom of the article and it will be noted that in this position, the wrapping material is smooth, and evenly and tautly drawn across the entire article.

In accordance with the present invention, the pedestal is heated so as to be able to perform a heat sealing function. This heating is acomplished by a heating means **11** located beneath and attached securely to the second support. The means **11** is a heating element in the form of a disc, for example made by "Chromalox," and which is heated by means of the electrical wires **12** from a 110 volt electrical source (not shown). A thermostat **14** is provided for the heating element, which thermostat has a control **14***a* extending downwardly from the support **10**, whereby the control **14***a* is out of the way, yet readily available for setting the maximum heat to be used on the support.

The support **10** includes a bracket **10***a* which is secured to the rear of the frame of the apparatus by bolt means **10***b*. Thus the heating element means **11** and thermostat are enclosed in the support.

Thus, as the operator places the partially wrapped package on the second support **10**, the band of wrapping material, which is formed around the article at that time, is sealed across its bottom as at **19**. By providing such a seal at this stage of the wrapping process, that is while the lateral sides of the wrapping material are being pulled outwardly in opposite directions, the wrapping material will not become loose during the subsequent wrapping procedure, now to be described.

It should be noted that all of the motion of the operator to this point has been in one continuous sweeping or looping motion of his hands. The material around the article has also been severed from its roll as will now appear.

The material is severed from its supply roll R immediately after the operator has stretched the material laterally outwardly and across the bottom of the article, and as the partially completed package is being set down on the second support.

The heat severing means **14** is conventional and includes the hot wire **15** which is electrically energized in the conventional manner and is secured by appropriate insulators **16**. This wire is located above the rearwardly and downwardly inclined surface **17** of the table top and as the partially completed package is set on the pedestal, the material comes into contact with the wire, immediately severing it. This forms a new leading edge **1***a* (FIG. 7) of the material which is ready for the next wrapping operation.

After the severing operation, as shown in FIG. 6, the operator then commences to immediately push his hands downwardly below the level of the article, and, with a continuous sweeping movement, brings his hands towards one another beneath the article, and then rises it (FIG. 7). This is possible due to the clearance provided under the article at each side thereof and the relative dimensions of the support and article.

The operator has thus lifted the package off the support and his hands at this time (FIG. 7) are still moving toward one another and pressing or smoothing the lateral ends of the material tightly and firmly against the bottom of the package P. Simultaneously the operator's hands are moving toward the conveyor **4** on which it is placed for heat sealing of the entire bottom of the package.

In addition to the angled platelike support **5** shown in the figures, any suitable means may be installed on the top of the frame for holding the package in the elevated position and providing the necessary clearance under each lateral side of the package. For example, the support **5** may take the form of a simple bar which is adjustably inserted in a series of holes in the table top. Thus, the bar may be adjusted to accommodate packages of various sizes or shapes.

Referring again to the support **10** (FIG. 8), it will be noted that a clearance **20** is provided between the top of the bracket **10***a* and the upper, inverted tray shaped portion **10***c* of the support. This clearance insulates the hot upper portion **10***c* from its bracket **10***a* and the rest of the apparatus other than the connecting bolt means **10***d* by which the upper portion **10***c* is connected to the bracket **10***a*.

Recapitulation

The wrapping apparatus and method provided by the present invention permits supporting the article with its lateral sides free, drawing the material over the article and then under its front edge thereby tautly overwrapping the article, lifting the overwrapped article and moving it so as to underwrap it and simultaneously pulling the material in laterally opposite directions thereby stretching it taut laterally over both the bottom and top of the article, again supporting said partially wrapped article with its lateral ends free and substantially simultaneously urging that material (which extends away from the operator) from the partially wrapped article against a heated severing means, pulling the free lateral ends of the material outwardly, and substantially simultaneously causing the band of wrapping material to be heat sealed on the support **10**. The sides are then pulled downwardly around the lateral sides of the article and under the article,

smoothly pressing those ends along the bottom of the package so formed, and then heat sealing the bottom.

All of the above motions are continuous and very rapid and the operator at all times has definite and positive control of the wrapping material, it being unnecessary to shift the weight of the package from one hand to the other in order to tightly wrap the material in a band, heat seal the band and then completely wrap the sides downwardly and under the article. This is possible even during that final portion of the wrapping method movement where the lateral ends of the material are brought underneath the partially formed and partially sealed package and smoothed along its under side.

After the package is completely wrapped, it is placed on the hot conveyor where the heat of the belt will seal the ends of the material to the bottom of the package. If a heat shrinkable material is used, a heat tunnel may be placed on the end of the conveyor to shrink the material if required.

The heated pedestal support provided by the present invention can also be used to apply the final seal, especially in wrapping articles of irregular shape. The irregularly shaped, wrapped article can be repeatedly lightly touched at its various surfaces against the heated pedestal, thus sealing it at various spots on its irregular surface.

The invention finds particular utility when wrapping film is used which is not as soft and flexible as other types. In that instance, the pre-sealing of the banded article is particularly advantageous before the final side tuck and sealing operations.

I claim:

1. Hand wrapping apparatus for wrapping an article with flexible and thermoplastic wrapping material, said apparatus comprising, a frame having an upper end located at a height convenient for an operator standing at a rear side thereof; a first support adjacent said upper end and at a front side thereof which is opposite to that rear side at which said operator stands, said first support adapted to support an article while being overwrapped, a

heated second support adjacent said upper end of said frame and located adjacent the rear side thereof, a heated severing device extending laterally across said upper end of said frame and located between said supports for severing said wrapping material on contact therewith, and means located between said first support and said severing means for presenting a leading edge of wrapping material whereby said leading edge of wrapping material may be pulled by said operator upwardly and over the article on said first support thereby overwrapping the article, said severing means adapted to sever material moved thereagainst after the overwrapped article is underwrapped by being moved over said severing means towards said second support to form a wrapping band around the article, said second support comprising a bracket secured to said frame and an inverted tray-shaped upper portion held in spaced relation to said bracket, and heating means attached inside of said upper portion for heat sealing the bottom of said wrapping band when the banded article is supported thereon, a settable thermostat in said upper portion and having a control means protruding from the bottom of said second support, said second support being of a lateral width less than that of the article and mounted to provide clearance under the laterally opposite sides of an article resting thereon.

References Cited

UNITED STATES PATENTS

2,987,864	6/1961	Miller	53—390
3,176,443	4/1965	Klamp	53—390
3,358,420	12/1967	Fellner et al.	53—390
3,367,589	2/1968	Chant et al.	

THERON E. CONDON, Primary Examiner

N. ABRAMS, Assistant Examiner

U.S. Cl. X.R.

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