April 8, 1941. J. A. NEUMAIR 2,237,911

PACKAGE AND METHOD OF WRAPPING AND BANDING

Original Filed Aug. 22, 1932 3 Sheets-Sheet 1

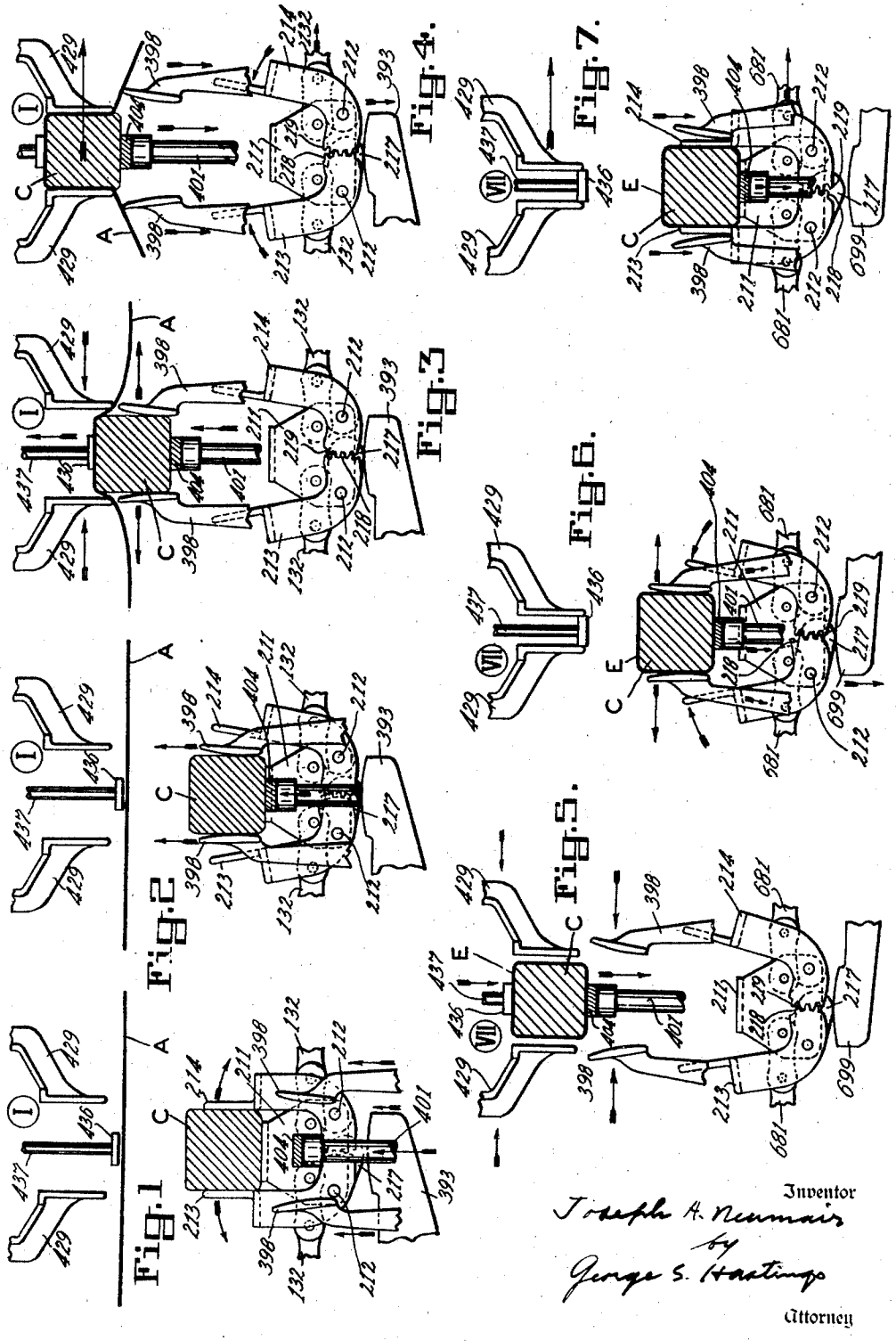


Fig. 1

Fig. 2

Fig. 3

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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PACKAGE AND METHOD OF WRAPPING AND BANDING

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Fig.29.

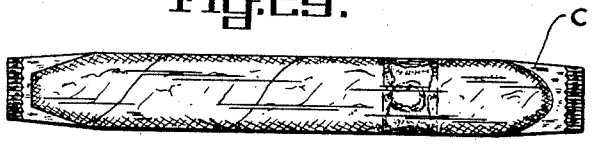


Fig.31.



Fig.30.

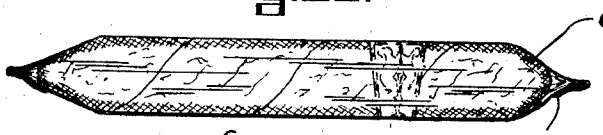
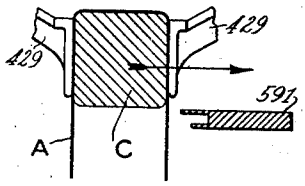


Fig.8.



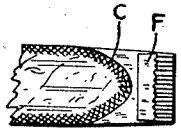


Fig.32.

Fig.9.

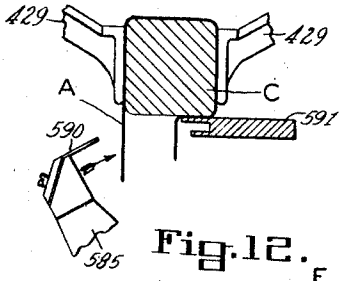


Fig.10.

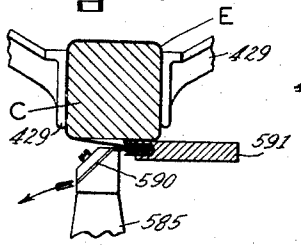


Fig.11.

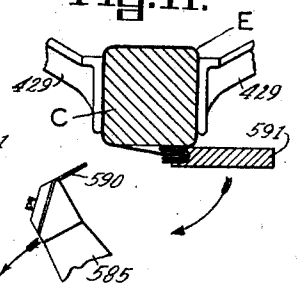


Fig.12.

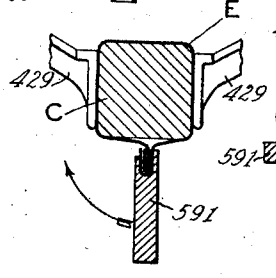
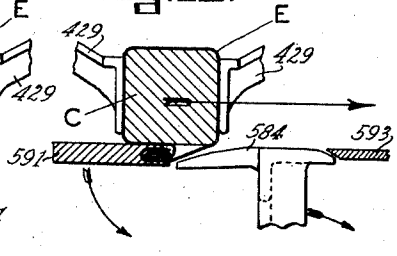


Fig.13.



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Fig.14.

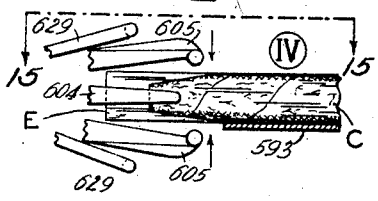


Fig.16.

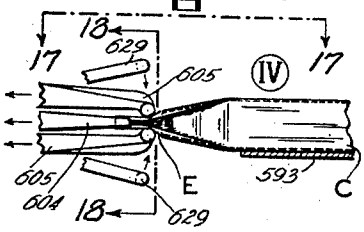


Fig.18.

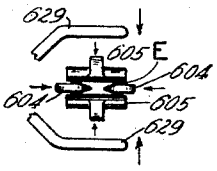


Fig.15.

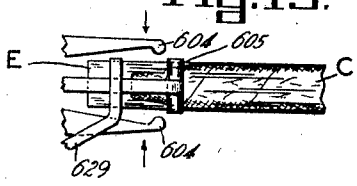


Fig.17.

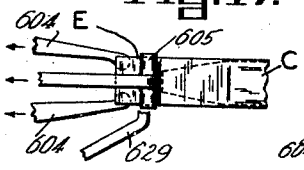


Fig.19.

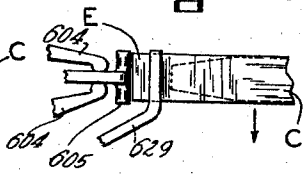


Fig.20.

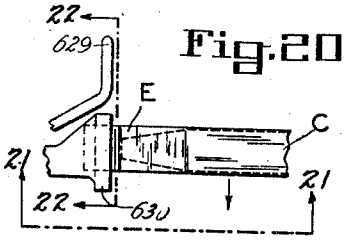


Fig.21.

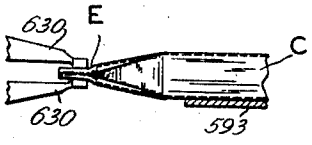


Fig.22.

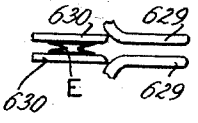


Fig.23.

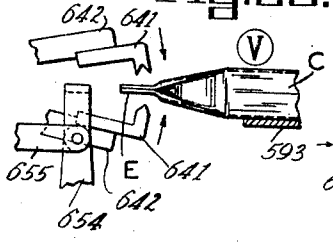


Fig.24.

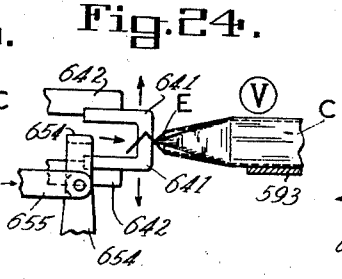


Fig.25.

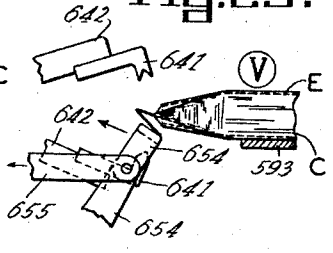


Fig.26.

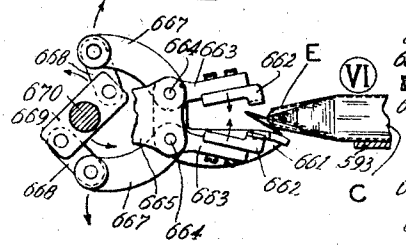


Fig.27.

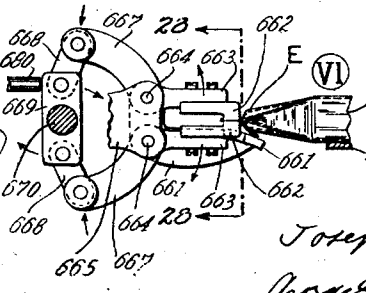
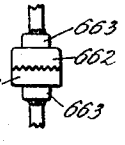


Fig.28.



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Patented Apr. 8, 1941 2,237,911

UNITED STATES PATENT OFFICE

2,237,911

PACKAGE AND METHOD OF WRAPPING AND BANDING

Joseph A. Neumair, Hollis, N. Y., assignor to International Cigar Machinery Company, a corporation of New Jersey

Original application August 22, 1932, Serial No. 629,959. Divided and this application April 15, 1937, Serial No. 137,039

6 Claims. (Cl. 93—2)

This invention relates to an improved package and method of packaging, and constitutes a division of my co-pending application S. N. 629,959, filed August 22, 1932, issued April 20, 1937, as Patent No. 2,077,431, covering wrapping machines, particularly machines operating on cigars or other articles and capable of handling flexible wrapping materials such for example as the thin transparent cellulosic material known by the trade name of "Cellophane."

An important object of the invention is to produce a cigar package using the above mentioned material wherein the package is sealed throughout without the use of heat. Another object of the invention is to provide a method and article employing a plicated or bellows type end fold and a longitudinal lock seam. To this end, it is also an object to retain the end folds in position by mechanical crimping not requiring heat, and of a type which is particularly efficient in overcoming the natural resilience of the above mentioned materials.

With these and other objects not specifically mentioned in view, the invention consists in a certain method and packages which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in which like characters of reference indicate the same or like parts, Figs. 1–7 inclusive show the sequence of steps for wrapping the cigar; Figs. 8–13 show the various operations during the formation of the lock seam; Figs. 14–28 show the various steps of plicating and forming bellows folds on the ends of the wrapper and finally crimping the same; and Figs. 29–31 are top, side and end views of the completed cigar package.

Figure 32 is a fragmentary detail view in bottom plan of the structure shown in Figures 29, 30 and 31.

The method employed in carrying the invention into effect comprises wrapping a resilient transparent sheet material about the article with its ends projecting beyond the end of the article, folding back the projecting material, and crimping the material on the fold line with corrugated crimps, the corrugations of which extend transversely of the fold line.

The package employed in carrying the invention into effect comprises a tube surrounding the article to be packaged and having a longitudinal lock seam, the tube having its ends plicated, flattened and turned back on the end of the cigar, the portions of the tube end adjacent the hinge line formed by turning back the ends, having a corrugated crimp to retain the material in position, thereby producing a sealed package without employing either heat sealing or gluing.

While the invention will be referred to and disclosed in connection with cigars, it should be thoroughly understood that the invention is applicable to a wide variety of articles other than cigars, particularly those of an elongated round or polygonal shape or of stick shape. It will be noted that owing to the fact that one phase of the invention is to dispense with heat for closing or sealing wrapping material with which heat has hitherto been used, the machine is particularly useful with an article liable to injury from heat, of which cigars, chocolate coated articles and silk or silk covered articles are cited by way of example.

A pair of conveyor chains **132** running over sprockets (not shown) have attached at spaced intervals, yokes **211** carrying pins **212** on which are pivoted fingers **213** and **214** connected by springs (not shown) whereby they are held against the sides of the inserted cigars. The cigars, or like articles, are designated generally by the reference character C. The U-shaped fingers **213** have furcations **217** (engaging with the member **393**), and the other furcations of the fingers have gear segments **218** meshing with gear segments **219** of the U-shaped fingers **214**.

When the cigars are inserted in the pockets formed by the fingers **213** and **214**, they are intermittently carried away to a banding unit (not shown) wherein they are banded.

It will be noted that the gripper fingers **213—214** acting on one cigar consist of two coacting sets or pairs of opposed grippers on the chains **132**, the two sets being spaced lengthwise of the cigar to provide room between them for banding operations and to admit transfer fingers.

Since the opposed grippers **213** and **214** are geared together by gear segments **218** and **219**, they will move equally and therefore the axis of a wide cigar will coincide with that of a narrow cigar. This is important to preserve a definite predetermined relationship between the cigar axis and the folding and banding mechanisms at the various operating stations. The cigar can be banded before or after wrapping, i. e. with the bands inside or outside the wrapper by mechanism which need not be shown.

As soon as the chain **132** stops its movement the bell crank levers **393** are actuated in such a way that the upper free parts press against the

extending ends 217 of the U-shaped gripper fingers 218, the gear segments 218 of which are in engagement with gear segments 219 thereby opening the grippers. In the meantime, shaft 401 has come up and met with its lifter plate 404, the cigar C. The clamping fingers 398 have also moved upward and are caused to close and clamp the cigar C which then is transferred into the pockets of the wrapper chain (Figs. 1–4).

It will be noted from the above and Figs. 1 to 7 that during this transfer there is at all times a positive grip on the cigar. Even at the moment when the wrapper pocket walls 429 open to receive and transfer fingers 398 open to release the cigar, said cigar is securely gripped from above and below by plunger 404 and tension plate 436.

As the cigar C reaches the wrapper blank A, positioned across the path of the ascending cigars, the wrapper is clamped between the cigar C and the top guide plate 436 and is then taken lengthwise with the cigar into the pocket of the wrapper chain formed by clamping lugs or walls 429 which fold the "Cellophane" smoothly over the sides of the cigar at station I of the wrapper chain. The cigar C is taken by the wrapper chain to an intermediate idler station and then to a third station where the bottom or longitudinal lock seam is made by a lock seam fold mechanism (Figs. 8–13).

As the cigar arrives at the intermediate station, the cigar has partly moved over folding plate 591 (Fig. 9) then by a swing of lever 585 the folding plate 590 tucks the hanging edges of the blank A into the groove of folding plate 591 (Fig. 10) and then retreats again (Fig. 11), thereby forming from the blank A, an envelope or tubular wrapping E, the ends of which project beyond the ends of the cigar. Then folding plate 591 makes one half of a revolution causing the lock seam to project in the opposite direction and interlocking the tucked ends.

The clamping pocket walls or plates 429 then take the cigar to station IV (Fig. 13). In order to prevent the lock seam from opening and to cover the gap between a stationary supporting plate 593, the bridge 584 swings in this space. As the cigar is pushed upon the same, the lock seam of envelope E is ironed smooth. For this purpose the bridge extends substantially the entire distance between plates 591 and 593. When the cigar reaches supporting plate 593, bridge 584 will swing backward and folding plate 591 returns to its original position. Plate 593 holds the lock seam while the cigar is at the following stations IV, V and VI, where the end folds of the envelope E are made.

As envelope E is now a tube open and projecting beyond the cigar at both ends, end folding mechanisms are provided to fold these projecting end portions.

The entire end fold mechanism consists of a bellows folding or tucking and flattening mechanism at station IV, (Figs. 14–19) a guiding or fold retaining mechanism (Figs. 20–22) between station IV and station V, a creasing mechanism (Figs. 23–25) at station V, and a crimping mechanism (Figs. 26–28) for crinkling or corrugating the creased end, operating at station VI.

The bellows folding mechanism at station IV, consists of a pair of narrow tuck fingers 604 and a pair of wide folding and flattening fingers 605.

The folding operations (Figs. 14 to 19) are performed in such a manner that tuck fingers 604 and 605 are opened and moved forward to the cigar C in an axial direction over and clearing the ends of envelope E (Figs. 14 and 15). Then fingers 604 and 605 close in on the envelope end until they exert light spring pressure on the cigar at the base of the taper. The fingers then move backward again (Figs. 16 and 17). The narrow tuck fingers 604 tuck and iron in the sides of the envelope E (Fig. 17), while the wide folding fingers 605, trailing the tuck fingers a little, flatten or press together top and bottom folds of the envelope. Both sets of fingers ride on the cigar under light spring pressure.

In order to hold the end fold until it reaches station V, a pair of swingable guide fingers 629 come down on the fold (Fig. 19) and prevent the same from opening up again, which is, because of the resilient nature of the wrapping material, likely to occur. On its way to station V, where the end fold is to be creased, the folded end passes furthermore through a pair of stationary guide fingers 630 (Figs. 20 to 22), so that the fold is guarded and held until it reaches the creasing mechanism at station V. It will be seen that the bellows fold is positively held flat by the several guiding, creasing and crimping mechanisms until finally crimped.

The creasing mechanism (Figs. 23–25), consists of a pair of creaser dies 641 mounted on a pair of supporting lugs 642.

As soon as the folded ends of the enveloped cigar arrive between the open creaser dies 641 (Fig. 23), the latter close and crease the folded ends of the envelope together (Fig. 24) along a transverse crease or fold line. Then the creaser dies 641 open again and folding finger 654, which is actuated by a link 655, swings forward to fold the overhanging end of the creased fold smoothly back on the lower part of the envelope E (Fig. 25). The folding finger 654 remains in this position, acting as a guide while the enveloped cigar is moved towards station VI, by the wrapper chain. As soon as the enveloped cigar reaches guide plate 661 of the crimper for holding the doubled back portion in position (Fig. 26), folding finger 654 returns to its original position.

The crimping mechanism (Figs. 26–28), consists of a pair of corrugated or crinkly surfaced crimper jaws 662 mounted on a pair of clamping lugs 663 which are pivoted to stud 664, held by supporting head 665 attached to a yieldingly mounted stud (not shown). Lugs 663 are equipped with levers 667 which are pivoted by means of links 668 to a double crank 669 mounted on shaft 670 which is supported by head piece 665. The double crank and links serve to form a double toggle for providing considerable pressure from opposite directions. Guide plate 661 is mounted stationarily to pivots 664 on head piece 665.

The corrugations of the jaws 662 are of V cross section. This crimp, particularly across a crease is effective in locking the fold and in overcoming the resilience of the material, at the extreme tip and where, with an accordion pleat, the crimp joins the taper of the package end.

In order to prevent breakage of parts or excess pressure on the wrapper, the head 665 is supported by a yielding horizontal stud, as previously noted. Parallel to this stud is mounted a safety stud 680. When crimper jaws 662, which are actuated from double crank 669 close to crimp the under folded and creased end fold of the envelope E (Fig. 27), the double crank 669 touches, when jaws 662 are entirely closed, the safety stud 680 which acts as a pivot on double crank 669 and due to the spring mounting of

the horizontal stud the entire crimper mechanism moves slightly towards the cigar, thereby preventing a break of the "Cellophane" and an injury to the working parts of the mechanism, and permitting the use of wrapping material of various thicknesses.

After the crimper jaws 662 open up again, the finished banded and enveloped cigar C is taken to station VII (Fig. 5), where it is transferred from the pockets of the wrapper chain into the grippers of a conveyor chain 681. This transfer mechanism is of the same type and construction as the one described and used for transferring the cigar C from the bander chain 132 into the pockets of the wrapper chain.

When the enveloped cigar C arrives at station VII, Fig. 5, the clamping lugs 429 are opened. In the meantime the lifter plate 404 has come up to meet the enveloped cigar (Fig. 5). At the same time, clamping fingers 398 are in open position directly underneath the open clamping lugs 429. The enveloped cigar C held between top guide plate 436 and lifter plate 404 is then guided in between the two clamping fingers 398 which immediately close and together with lifter plate 404 (Fig. 6), transfer the enveloped cigar into the open grippers of the second conveyor chain 681. As soon as the enveloped cigar C is placed in the gripper fingers 213 and 214, bell crank lever 699 releases extending end 217 and fingers 213 and 214 close, due to being suitably biased to closing position, as hereinbefore mentioned. At the same time, clamping fingers 398 open again and together with lifter plate 404 go downward to their lowermost position. The enveloped cigar C is then conveyed by chain 681 towards the delivery end of the machine.

If it is desired to apply the band B after the cigar is enveloped, the banding mechanism can be attached above the second conveyor chain 681.

The cigar and wrapper sheet are pushed into opened pockets on the wrapper chain while the cigar is lightly but continuously gripped between opposite surfaces to prevent displacement of the cigar at the high speeds at which the machine is designed to operate. The pocket walls close on the cigar before the cigar completes its upward movement to pull the wrapper down tightly on the top and corners of the cigar. The depending edges of the wrapper are then lapped and lock seamed as previously described to form a tube projecting at either end beyond the cigar.

The tube ends are then plicated or bellows folded by tuckers followed by flattening fingers (Figs. 14 to 28) both of which are lightly spring pressed to ride down the taper of the cigar to closely fit and iron the folded wrapping or envelope against the cigar ends of variable shape without danger of breaking the cigar. This ironing and flattening has a stretching action on the lock seam which prevents gapping. Since cellulosic material most used with this machine is quite resilient guides 629 and the inner surfaces of the flatteners and crimpers employed cooperate to continuously hold the previously made folds till the final crimp is made.

The bellows fold is then crimped to transversely crease it and the end portion beyond the crimp folded back and in order to maintain this position of the material a series of sharp crinkles or corrugations of V cross-section are crimped into the material transversely of the crease or fold line. This has the effect of locking the folds and the sharp angles and apparently the stretching of the material at the apexes takes the resilience out of the material where crimped.

The sharp grooves form accordion pleats having a spear point formation which serves to neatly merge the crimped portion into the chisel shaped package end, and to prevent the crimped point from opening up at this point, the spear shaped points apparently taking the resilience out of the material at this location. By the foregoing, the heat sealing commonly employed is rendered unnecessary. Since heat sealed packages of the transparent cellulose materials often open up at the seam and ends unless enough heat is used as to hurt the appearance of the material and endanger the cigar, the method of closure just described and the resulting package have substantial advantages.

What is claimed is:

1. A "Cellophane" wrapped cigar package comprising a cigar and a tube of "Cellophane" having its end bent back on a hinge line beyond the end of the cigar and crimped with a corrugated crimp extending transversely across said hinge line and lengthwise with respect to the cigar, the corrugations of said crimp being terminated at a region beyond which the reverted end of the tube is crimp-free, and said crimp being self-retentive exclusively by virtue of adhesive-free folds compressed beyond the elastic limit of the "Cellophane."

2. A package comprising a tube of pliable wrapping material enclosing an article and having its ends plicated and turned back on the ends of the article, said tube being made of somewhat resilient material capable of taking a set when folded and compressed beyond its elastic limit, the hinge line formed by turning back the ends having a corrugated crimp to retain the material in position, said crimp extending transversely of the hinge line and lengthwise of the tube, being self-retentive exclusively by virtue of its adhesive-free folds compressed beyond the elastic limit of the pliable material, and said tube having a reverted, crimp-free end unsecured locally to the body of the tube.

3. A wrapped cigar package comprising a cigar and a tube of somewhat resilient, pliable material having an elastic limit of the order which characterizes "Cellophane," each end of said tube being bent back on a hinge line beyond an end of the cigar and crimped with a corrugated crimp, the corrugations of which run across the hinge line and lengthwise with respect to the cigar, all of said corrugations extending in continuous wave-form bodily across the breadth of the crimp, and extending through the mean plane of the crimp.

4. The method of wrapping cigars and the like in "Cellophane" which comprises wrapping somewhat resilient "Cellophane" circumferentially about the cigar to form a tube with the end portions of the tube extending beyond the end of the cigar, tucking in opposite sides of the tube at the ends to form a bellows fold, reverting the end of each bellows fold about a transverse hinge line, flattening the tucked portion and crimping the flattened and tucked portion beyond the end of the cigar with a series of sharp crimps having a generally V-shaped cross-section extending across said hinge line of the fold at the projecting portion of the tube to take the elasticity out of the material and close the end of the tube, said crimp being self-retentive exclusively by virtue of adhesive-free folds compressed beyond the elastic limit of the "Cellophane."

5. The method of wrapping cigars and the like

in "Cellophane" which comprises wrapping a sheet of somewhat resilient "Cellophane" about the cigar with the end portion of the tube extending beyond the end of the cigar, flattening said projecting portions of the tube to form component plies, reverting the end of each of said projecting portions about a transverse hinge line, and crimping the flattened portions thus associated to form a series of sharp crimps adjoining each other in continuous waves across the width of said flattened portions, to close the tube, forming a flat, tight tube-end, said crimp being self-retentive exclusively by virtue of adhesive-free folds extending across each of said hinge lines and compressed beyond the elastic limit of the "Cellophane."

6. A wrapped cigar package having the features claimed in claim 1, wherein said tube-end has a terminal portion extending rearwardly from the crimped portion toward the cigar, said terminal portion being both crimp-free itself, and free from attachment to an adjacent crimp-free portion of the body of the tube.

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