Oct. 11, 1949. C. E. GARDNER 2,484,340

METHOD OF MAKING ARTICLE COVERS

Original Filed Sept. 20, 1945 3 Sheets-Sheet 1

FIG. 1

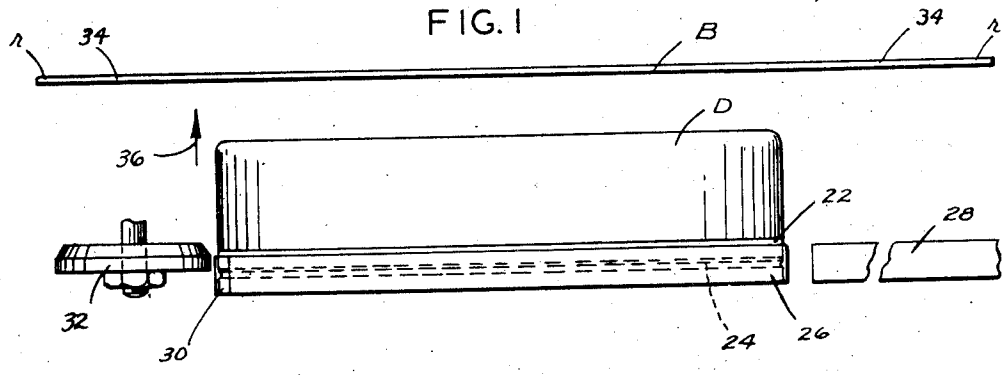


FIG. 2

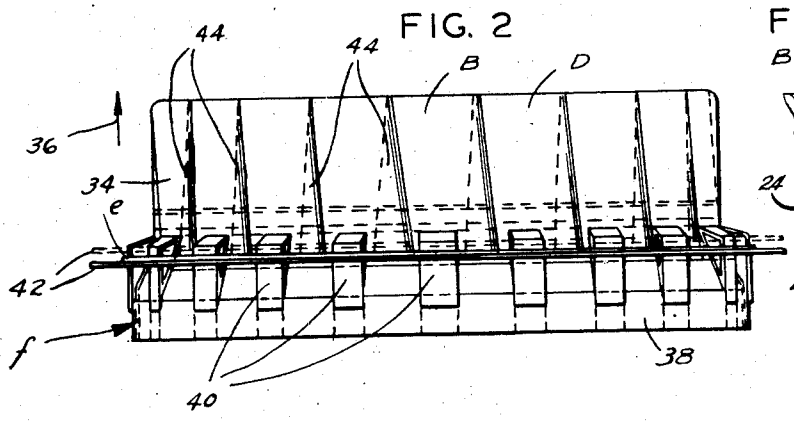
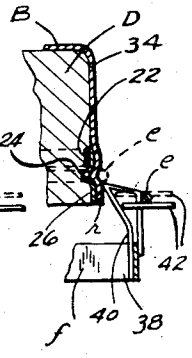


FIG. 2A



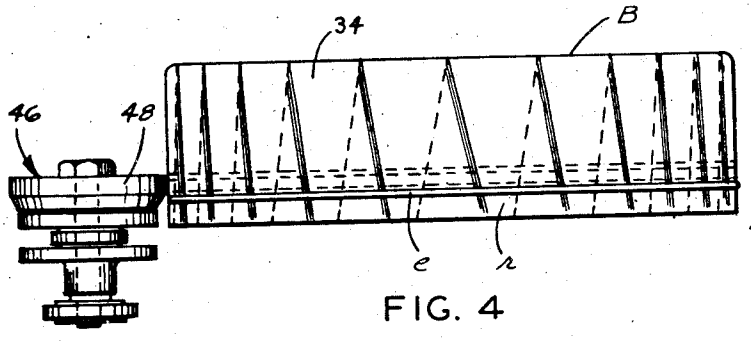


FIG. 4

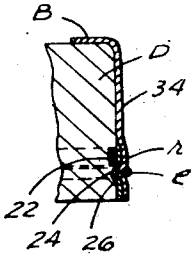


FIG. 4A

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FIG. 3

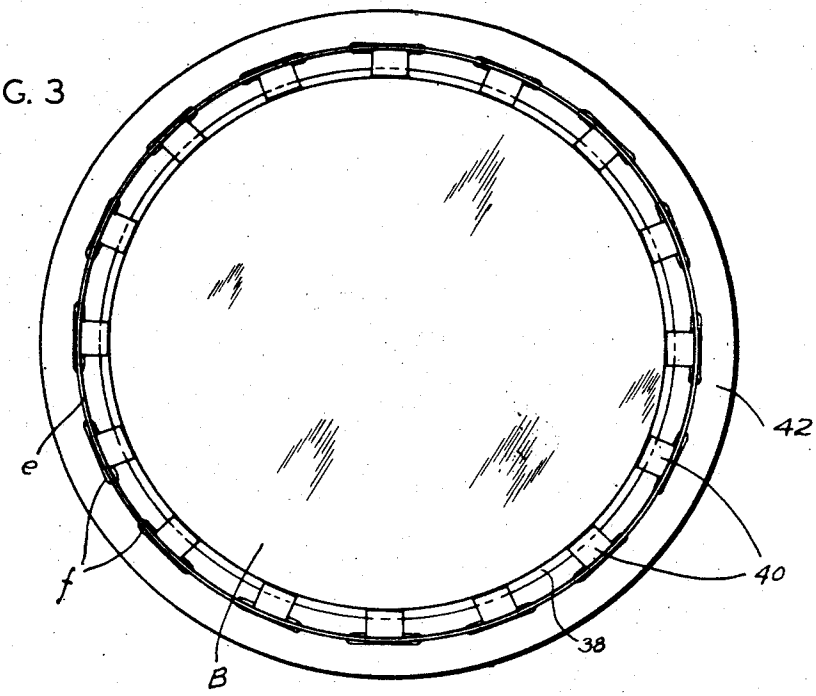


FIG. 5

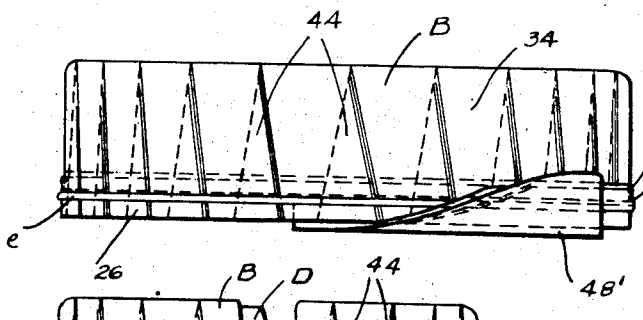
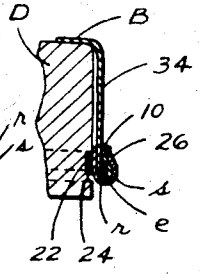


FIG. 5A



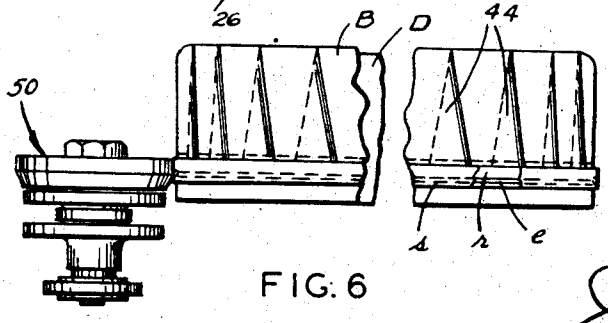


FIG. 6

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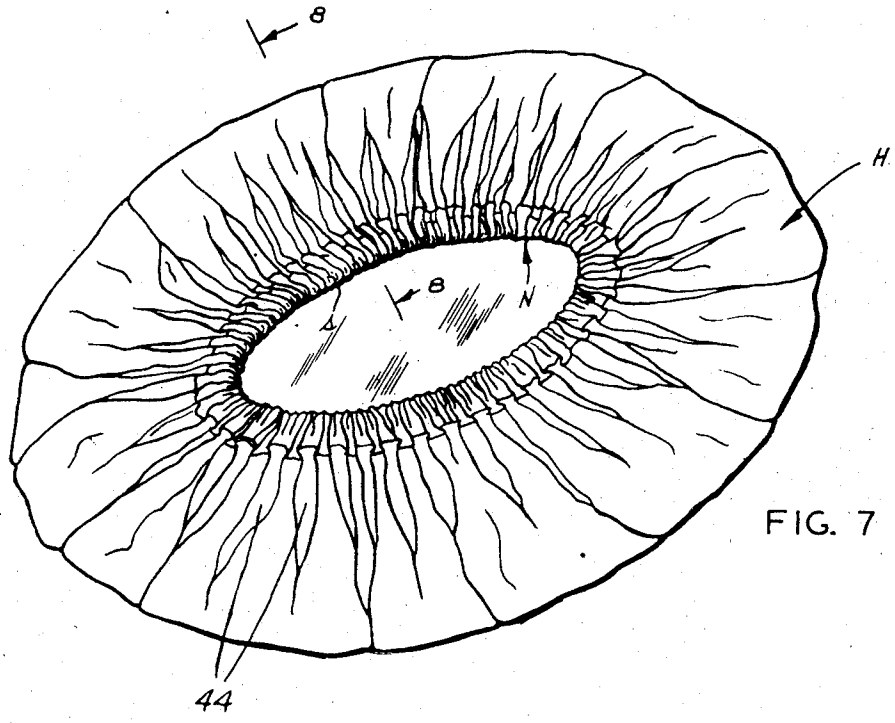


FIG. 7

FIG. 8

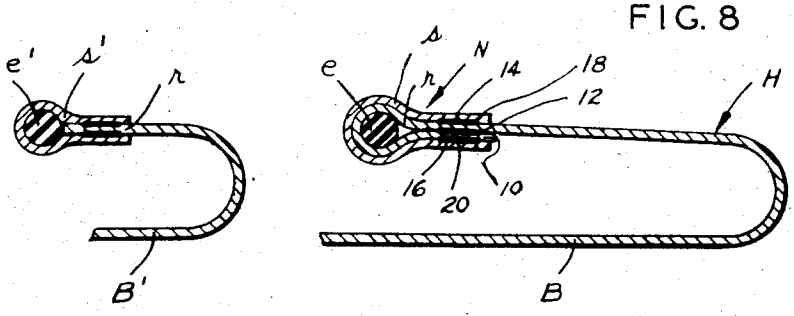


FIG. 9

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UNITED STATES PATENT OFFICE

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METHOD OF MAKING ARTICLE COVERS

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Original application September 20, 1945, Serial No. 617,478. Divided and this application August 22, 1947, Serial No. 770,077

6 Claims. (Cl. 154—124)

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This invention relates to a novel article cover and to the method of making the same.

This application is a division of my copending application to "Article cover," Serial No. 617,478, filed September 20, 1945, now Patent No. 2,432,662.

Article covers with which the present invention deals comprise a flexible body made of sheet stock having a head section adapted to be placed over the article to be covered and having a neck portion at the opening of the head section which is distensible and contractible so that it may be distended or stretched over to embrace the article to be covered and then contracted to enclose or seal the covered article. Such article covers are used for a variety of purposes such as household utensil covers, e. g., dish, bowl, platter, milk bottle and steam table covers; head covers, e. g., shower caps and uniform cap covers; and other general article covers, e. g., lamp, tennis racket and steering wheel covers.

Article covers of this nature have been made by taking a sheet blank of the desired size and applying to the rim of the blank an elastic or elastic webbing or rubberized material in such a way that the rim and elastic applied element produces the distensible and contractible neck of the formed article cover. The rim is at the same time so formed as to produce a finished binding for the neck portion of the cover.

In these article covers of present manufacture, the neck portion is made either by folding the rim of the cover blank over so as to enclose an elastic or rubber band, the folding being then stitched to the rim material, or the rim of the cover blank is enclosed in a channel shaped strip of ribbon stock which is also then stitched to the rim material, the ribbon stock enclosing either an elastic or rubber band or being made of an elastic webbing or rubberized material. Instead of stitching the rim fold or the rim applied strip to the rim material, it has also been suggested to adhesively attach these parts by some suitable adhesive substance. These prior made structures are attended, however, with numerous disadvantages both concerning the method of manufacturing the cover and the uses to which the covers are put, which disadvantages will be apparent upon considering the advantages, with reference both to the manufacturing method and the use of the covers, which flow from the method and the improved product of the present invention.

In the article cover of the present invention, the head section of the article cover is made of a thermoplastic film material and the neck portion consists of a channel shaped strip also made of a thermoplastic material which is integrally thermo-sealed circumferentially on its opposite sides to the rim of the head section, an electric or rubber band being enclosed thereby at the base of the channel. The neck portion thus formed not only produces as in known constructions the contractible and distensible neck and opening for the cover and a binding trim for the cover opening, but produces article covers which are attended with the following novel advantages:

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(1) A completely sealed-in binding strip or trim is produced for the cover, since all of the parts at the neck portion of the cover are integrally thermo-sealed together. This is especially desirable when the covers are used as kitchen utensil covers, since an all-sanitary edge or neck portion is produced, eliminating the possibility of any food particles migrating into and lodging in the edge binding or strip material.

(2) Heat-sealing or thermo-sealing the strip or binding material to the body of the cover material increases the strength and durability of the article cover to its maximum condition of wear. This increased strength is the result of fusing together the thermoplastic film stock of which the cover head is made and the thermoplastic strip or binding stock of which the binding trim is made.

(3) A better article cover is produced resulting from the method of making this product, since the binding strip is not allowed to be stretched in use beyond its elastic limit.

(4) Sewing machine operations are entirely eliminated, the weakening effect in use due to stitching the material at the neck portion of the article cover is obviated, and in lieu therefor a simple heat-sealing method of producing the article is presented with a consequent strengthening of the neck portion of the article cover due to the integral heat-sealing of the neck portion.

(5) The product allows for the use of elastic or rubber bands in place of braided elastic or strip rubber sheet heretofore extensively used, thus reducing the cost of the materials employed in the making of the product.

(6) A more uniform article cover product is produced because the variations due to the human element in the making of the stitched neck product are eliminated and production of the product is more readily controlled; and

(7) A more attractive and in fact highly decorative article cover is produced, particularly where contrasting colors are used for the head

section and neck portion materials, a very finished and highly ornamental effect being thereby produced.

To the accomplishment of these objects and such other objects as may hereinafter appear, my invention relates to the article cover product and the method of making the same as sought to be defined in the appended claims and described in the following specification taken together with the accompanying drawings in which:

Figs. 1 through 6 are views illustrating steps employed in the method of making the article cover of the present invention; and

Figs. 7 to 9 are views of article covers as produced by the method of the present invention; and of these—

Fig. 1 is a view illustrating the initial step or steps of said method and showing the arrangement or disposition of the tool and material parts in such initial step;

Fig. 2 is a view illustrating a next or subsequent step in practicing of the method;

Fig. 2ª is a fragmentary end view taken in cross-section of the disposed parts as shown in Fig. 2;

Fig. 3 is a view illustrating the step of the method shown in Fig. 2 and showing a top plan view of the parts as disposed in this step of the method;

Fig. 4 is a view illustrating a third step in said method;

Fig. 4ª is a fragmentary end view taken in cross-section of the disposed parts shown in Fig. 4;

Fig. 5 is a view illustrating what might be considered as a fourth step of the said method;

Fig. 5ª is a fragmentary end view taken in cross-section of the disposed parts shown in Fig. 5;

Fig. 6 is a view showing the final step of the method of making the article cover of the present invention;

Fig. 7 is a perspective view of the article cover produced by this method;

Fig. 8 is a fragmentary view of the article cover drawn to an enlarged scale and taken in cross-section in the plane of the line 8—8 of Fig. 7; and

Fig. 9 is a view corresponding to that of Fig. 8 drawn to a smaller scale and showing a modified product of the invention made by a modified method of the invention.

Referring now more in detail to the drawings and having reference first to the illustrations of the produced article cover as shown in Figs. 7 and 8 of the drawings, the article cover of the invention comprises a body of flexible sheet material having a head section generally designated as H provided with a reversely turned part affording a stretchable neck portion generally designated as N, the head section being made of a thermoplastic film material and the said neck portion consisting of a channel shaped strip *s* also made of a thermoplastic film material which is integrally thermo-sealed circumferentially on its opposite sides to the rim *r* of the head section H, and an elastic or rubber band *e* enclosed by the said channel shaped strip and lying at the base of the channel, all as best shown in Fig. 8 of the drawings. In the structure shown in Figs. 7 and 8, the rim *r* itself is folded up and the channel shaped strip *s* encloses and is thermo-sealed circumferentially on its opposite sides or branches to the folded rim *r*, the fold in the rim being similarly integrally thermo-sealed to the cover body material. Thus the rim *r* is provided with the fold 10 which is integrally heat-sealed or fused to the material of the cover head H illustrated by the heavy shading line 12 between these parts and the opposite sides or branches 14 and 16 of the channel strip *s* are in turn heat-sealed and fused to the rim material as illustrated by the heavy shading 18 and 20 at the contiguous or contacting faces or surfaces of these parts. The elastic band *e* is in this form of the invention enclosed by both the rim fold and the channel shaped strip.

In the resulting article cover as best shown in Fig. 7, the neck portion N forms the usual contractible and distensible neck or opening for the article cover, and the thermo-sealed or fused channel strip *s* forms also a sealed-in binding trim for the cover opening. Other characteristics and properties of this construction will become evident and will be further explained after considering the method of making this product.

The process of making this article cover is illustrated as aforesaid in Figs. 1 to 6 of the drawings, which show what may be considered sequential steps in practicing the process.

Considered in its generic aspects and reverting for the moment to Fig. 8 of the drawings, the process consists in taking a sheet blank B made of a thermoplastic film material, applying an elastic or rubber band *e* to the rim *r* of the blank, enclosing the rim of the blank and the rubber band circumferentially in a channel shaped strip *s* also made of a thermoplastic film material, and integrally thermo-sealing opposite side branches 14 and 16 of the channel shaped strip to the rim material. The thermoplastic film material for both the sheet blank and the channel shaped strip may, for example, be a rubber hydrochloride product known as "Pliofilm," or a vinyl chloride film product known as "Vinylfilm," or may be any of the varieties of a polyvinyl alcohol plastic film now obtainable. These plastic film materials are made in various colors and in sheets or films which are generally transparent or translucent. By utilizing different colored stock for the head section and neck portion of the article cover, attractive two-tone or color-contrasting products may be produced. In carrying out the process, the elastic element or rubber band *e* when applied to the rim is preferably stretched to a normal condition of use for the cover, the part then resulting from the method then taking the form and shape shown in Figs. 7 and 8 of the drawings.

In carrying out this process, the parts may be applied to, formed and processed on a rotatable mandrel or drum D (see Fig. 1). This drum D may be provided in its body with a rubber ring 22 below which the drum is formed with a circumferential groove or channel 24 (see particularly Figs. 1 and 2ª). In the first step or steps of the process a ribbon strip 26 taken and cut from a supply 28 of this material coming from a reel (not shown) is applied or wound around the drum D and the ends are overlapped as at 30 and integrally thermo-sealed by the application to these ends of a heated element or heat sealer 32. The heat is preferably applied to the ends of the ribbon stock only in the region above the channel or groove 24 as illustrated in Fig. 1. Over this mandrel or drum D is then placed a sheet blank B made of a thermoplastic film material, which, as above described, ultimately forms the head of the article cover.

In the next stage or step of the process, the

rim section 34 of the blank B is turned down around the drum D, the parts being so dimensioned that the rim *r* of this rim section overlies at least a part of the ribbon strip 26. This operation may be appropriately accomplished by moving the drum D with this applied ribbon upwardly in the direction indicated by the arrows 36, 36 in Figs. 1 and 2 so as to first engage the blank B and so as to then move the produced assembly through a forming element or former generally designated as *f* shown in Fig. 2 of the drawings (and separately in Fig. 3 of the drawings).

The former *f* functions to turn down the rim section 34 to form smooth evenly spaced creasing folds therein and also functions for the next step which is to apply the rubber band or elastic onto the assembly thus produced.

The former *f* may for these purposes comprise a ring shaped element 38 having circumferentially spaced thereabouts the forming fingers 40, 40, the fingers being designed in the form of loop elements which receive a vertically movable push ring 42 movable between the full and dotted line positions shown in Fig. 2 and Fig. 2a of the drawings. When the drum D together with the applied ribbon 26 and the blank B are moved upwardly through the former *f*, the fingers 40, 40 (preferably made resilient) smoothly turn down the rim section 34 of the blank B permitting the formation of uniformly and evenly arranged creasing folds 44, 44 in the blank material. This is best shown in Fig. 2 of the drawings.

When the drum D and former *f* assume the positions shown in full lines in Fig. 2 and Fig. 2a, the rubber band or elastic *e* is placed in the full line position shown in these figures at the junction between the fingers 40 and the push ring 42. The push ring 42 is then moved upwardly from its full to its dotted line position, thereby moving the elastic element upwardly and permitting the same to contract and move inwardly to the position shown in dotted lines in Fig. 2a of the drawings, in which position the rubber band causes the lodging of the contiguous parts of the rim *r* and the ribbon strip 26 to move into the drum groove 24 (see Fig. 2). In this stage of the process, the rubber band is stretched so that when it assumes its last described position, it is stretched to a condition corresponding to the normal stretchable used condition of the finally formed cover. After this operation, the drum D and the parts assembled thereto are given a further upward movement so as to remove the same completely from the former *f*.

In carrying out the last described operational stage of the process, the rubber band *e* is applied to the rim *r* of the blank B substantially medially of the ribbon 26. In the exemplification of the invention shown in the already described figures, the rim *r* of the cover blank overlies the full width of the ribbon 26, but it will be understood (by reference to the modification to be described in connection with Fig. 9) that the said rim may be caused to overlie only part, as, for example, substantially half of the width of the ribbon 26. When the process is practiced as shown in Fig. 2 and Fig. 2a, the rubber band *e* is not only arranged medially of the ribbon 26, but also above the lower edge of the rim *r* so that the same is subsequently enclosed not only by the ribbon strip, but by the fold that is produced in the subsequent steps of the process in the rim *r*.

The next stage or step of the process is depicted in Figs. 4 and 4a of the drawings. While the integral thermo-sealing of all of the parts of the neck N of the article cover may be produced in one operation, it is preferred, particularly in connection with the article of Figs. 7 and 8 of the drawings, to carry out the thermo-sealing operation in two steps. The first of these steps is illustrated in Figs. 4 and 4a. These figures illustrate the assembling of the parts after the drum D and its assembled elements are removed from the former *f*. The elements of the embryo cover are now held assembled to the drum by the elastic band *e*. With the parts thus assembled or disposed, the next step consists in circumferentially heating the overlying parts of the rim *r* and the ribbon 26 above the rubber band *e* to integrally thermo-seal these parts. This is accomplished by the use of a roller heat-sealer generally designated as 46 which has a roller heating surface 48, heated and rotated in any approved way, which is brought into contact with the rim *r* in the region above the elastic band *e*, as clearly shown in Fig. 4. The drum D and its assembled parts are rotated one or more revolutions after the heater is brought into the described engagement. This heating operation causes the fusion of the overlying parts of the rim and ribbon disposed above the rubber band and the integral thermo-sealing of these parts. When this operation is completed, the roller heat-sealer is removed from its engagement and its sphere of operations.

The next step or stage of the process consists in circumferentially folding up the ribbon 26 to produce the channel shaped ribbon strip *s* described, which thereby encloses the rim *r* and the rubber band *e*; and in the form of the invention now being described, this operation additionally consists in circumferentially folding up the rim *r* to produce therein the previously described fold 10 thereof, in which case both the fold and the strip enclose the rubber band *e*, the binding strip in turn enclosing the rim fold. This step is carried out by rotating the produced assembly of Fig. 4 while the same is in engagement with a turn-up folding element 43' (held stationary) formed and channelled as indicated in Fig. 5 of the drawings, so that upon rotation of the drum D and its assembled parts, the overlying parts of the ribbon 26 and the rim *r* located below the rubber band *e* are turned up into the position shown to the right of Fig. 5 and shown in cross-section in Fig. 5a. The fold 10 in the rim *r* is thereby produced and the ribbon 26 is thereby formed into the channel shaped strip *s*, both enclosing the elastic *e*. The resulting assembly is as indicated in Fig. 5a of the drawings.

The last step or stage of this forming process consists in circumferentially heating the folded up parts of the rim and the strip above the rubber band and thereby integrally thermo-sealing these parts together. This step of the operation is illustrated in Fig. 6 of the drawings. The drum D and its assembled parts is again rotated and the roller heat-sealer generally designated as 50 (which may be the same heat-sealer aforedescribed) is brought into engagement with the overlying parts of the folded rim *r* and the strip *s* disposed above the rubber band *e* as is shown in Fig. 6 of the drawings, the drum being given one or more revolutions to effect this heat-sealing operation. After this operation, the heat-sealer is moved out of its engagement and out of the sphere of its operation.

The now completed article cover may be slipped off the drum D and preferably is turned inside out into the condition shown in Figs. 7 and 8 of the

drawings, the turning being preferred so that on the outside of the product only one instead of two added layers is observable at the neck.

In the modified structure shown in Fig. 9 of the drawings, the rim material *r'* of the blank B' is brought down into overlying relation with the material of the strip *s'* so that only a part of the strip is contacted and the rubber band *e'* is applied to the assembly just below the edge of the rim *r'*. The remaining step operations are the same except in this case the thermo-sealing operations may, if desired, be accomplished in one step. The strip *s'* in this product of the invention comprises a channel shaped element which alone envelops the rubber band *e'* and both side branches of which are heat-sealed and fused directly to opposite faces of the rim *r'* of the blank material.

The method of making the article cover and the product thereby produced, together with the various advantages accruing and flowing therefrom, will now in the main be fully apparent from the above detailed description thereof. The contractible and distensible neck N forms a sealed-in binding trim for the cover opening. An integrally fused and fully sealed-in binding strip is produced with all the described advantages attendant therefrom. A thermo-sealed neck N is obtained which because of the fused character of the parts is strong and durable. The multi-layered and integrally fused parts of this neck portion produce or form a reinforced cover opening of such a character that the binding strip is not allowed to stretch beyond its elastic limit and beyond the elastic limit of the enveloped rubber band. This elastic limit is well defined or set by the form or shape into which the parts are produced on the drum or mandrel, the shape being exemplified, for instance, by that shown in Fig. 5a. The latter is the normal condition of stretch to which the article cover is or should be subjected; and the neck produced by the described method resists any stretching beyond this prdetermined limit. The durability of the resulting product is thereby further assured. The heat-sealing operations eliminate the human elements and also the disadvantages in manufacture and use which flow from the employment of stitching operations and weakening stitches in the neck material. The prior use of braided elastic or strip rubber sheet is obviated and there is substituted therefor a trim thermoplastic binding. Very attractive and highly ornamental article covers of a very marketable value are produced.

It will be apparent that while I have shown the method and the product of my present invention in certain preferred forms and steps, that many changes may be made therein without departing from the spirit of the invention defined in the following claims.

I claim:

1. The process of making an article cover consisting of a body of flexible sheet material having a head section and a stretchable neck portion, which process consists in taking a sheet blank made of a thermoplastic film material, turning down a rim section of said blank, applying a rubber band stretched to a normal condition of use for the cover to the rim of said turned down rim section, enclosing the rim of the blank and the rubber band circumferentially in a channel shaped strip also made of a thermoplastic film material, and integrally thermo-sealing opposite side branches of the channel shaped strip to the rim material, thereby producing a cover having a contractible and distensible neck defining also a thermo-sealed-in binding trim for the cover.

2. The process of making an article cover consisting of a body of flexible sheet material having a head section and a stretchable neck portion, which process consists in taking a sheet blank made of a thermoplastic film material, turning down a rim section of said blank, applying a rubber band stretched to a normal condition of use to the rim of said turned down rim section, folding said rim, enclosing the folded rim of the blank and the rubber band circumferentially in a channel shaped strip also made of a thermoplastic film material, and integrally thermo-sealing the folded rim and opposite side branches of the channel shaped strip to the rim material, thereby producing a cover having a contractible and distensible neck defining also a thermo-sealed-in binding trim for the cover.

3. The process of making an article cover consisting of a body of flexible sheet material having a head section and a stretchable neck portion, which process consists in applying around a drum a ribbon made of a thermo-plastic material, placing a sheet blank also made of a thermoplastic film material over the top of said drum, turning the rim section of said blank down around said drum with the rim overlying part of the ribbon, applying a rubber band to the rim of the blank substantially medially of said ribbon, circumferentially folding up said ribbon to produce a channel shaped strip which thereby encloses the rim and the rubber band, circumferentially heating the strip and the rim above the rubber band and thereby integrally thermo-sealing opposite side branches of the formed channel shaped strip to the rim material, and thereby producing a cover having a contractible and distensible neck defining also a thermo-sealed-in binding trim for the cover.

4. The process of making an article cover consisting of a body of flexible sheet material having a head section and a stretchable neck portion, which process consists in applying around a drum a ribbon made of a thermoplastic material, integrally thermo-sealing the ends of said ribbon, placing a sheet blank also made of a thermoplastic film material over the top of said drum, turning the rim section of said blank down around said drum with the rim overlying part of the ribbon, applying a rubber band to the rim of the blank substantially medially of said ribbon, circumferentially heating the overlying parts of the rim and ribbon above the rubber band to integrally thermo-seal these parts, circumferentially folding up said ribbon to produce a channel shaped ribbon strip which thereby encloses the rim and the rubber band, circumferentially heating the folded up part of said strip above the rubber band and thereby integrally thermo-sealing the same to the rim material, and thereby producing a cover having a contractible and distensible neck defining also a thermo-sealed-in binding trim for the cover.

5. The process of making an article cover consisting of a body of flexible sheet material having a head section and a stretchable neck portion, which process consists in applying around a drum a ribbon made of a thermoplastic material, placing a sheet blank also made of a thermoplastic film material over the top of said drum, turning the rim section of said blank down around said drum with the rim overlying the ribbon, applying a

rubber band to the rim section of the blank substantially medially of said ribbon, circumferentially folding up said ribbon and rim to produce a fold in the rim and a channel shaped ribbon strip which latter encloses the rim and the rubber band, circumferentially heating all parts of the folded rim and channel shaped strip above the rubber band and thereby integrally thermo-sealing opposite side branches of the formed channel shaped strip and the rim material, and thereby producing a cover having a contractible and distensible neck defining also a thermo-sealed-in binding trim for the cover.

6. The process of making an article cover consisting of a body of flexible sheet material having a head section and a stretchable neck portion, which process consists in applying around a drum a ribbon made of a thermoplastic material, integrally thermo-sealing the ends of said ribbon, placing a sheet blank also made of a thermoplastic film material over the top of said drum, turning the rim section of said blank down around said drum with the rim overlying the ribbon, applying a rubber band stretched to a condition of normal use for the cover to the rim of the

blank substantially medially of said ribbon, circumferentially heating the overlying parts of the rim and ribbon above the rubber band to integrally thermo-seal these parts, circumferentially folding up said ribbon and rim to produce a fold in the rim and a channel shaped ribbon strip which latter encloses the rim and the rubber band, circumferentially heating all parts of the folded rim and channel strip above the rubber band and thereby integrally thermo-sealing the same to the rim material, and thereby producing a cover having a contractible and distensible neck defining also a thermo-sealed-in binding trim for the cover.

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