

Dec. 19, 1967

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3,359,149

METHOD OF MAKING A PLASTIC CLOTHES PROTECTOR

Original Filed Jan. 17, 1963

2 Sheets-Sheet 1

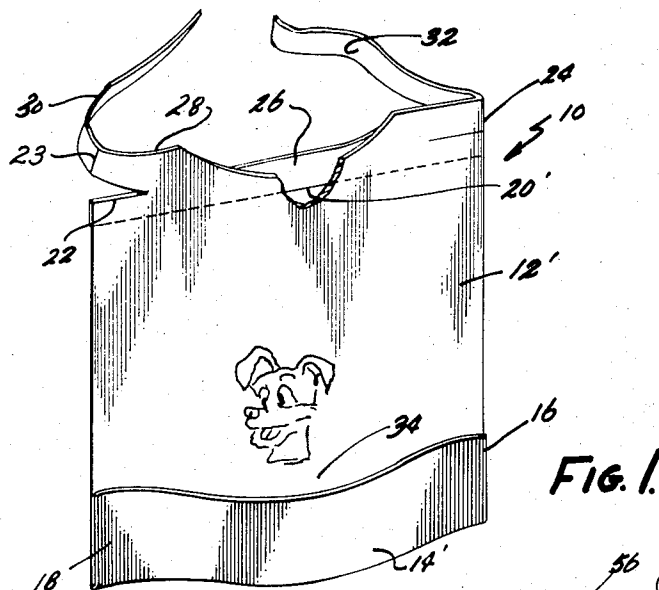


FIG. 1.

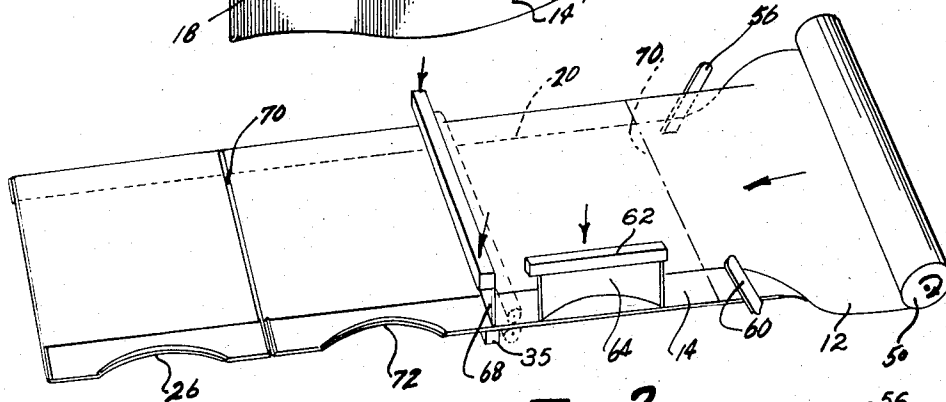


FIG. 2.

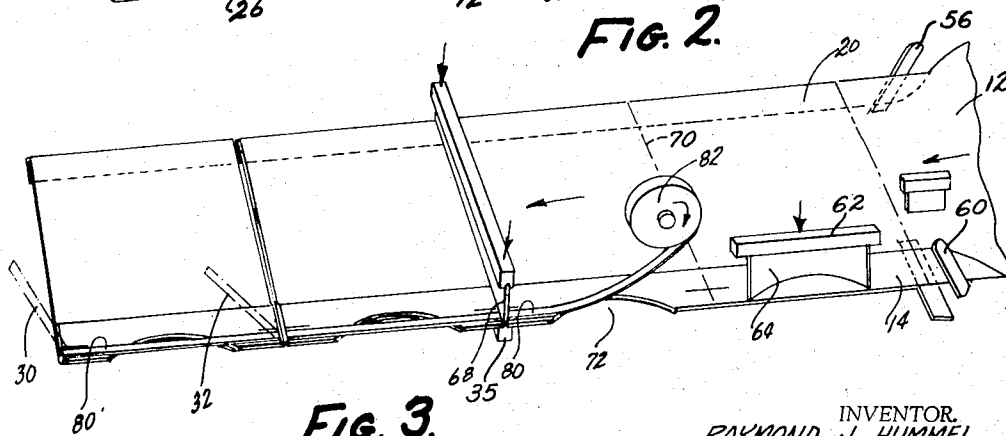


FIG. 3.

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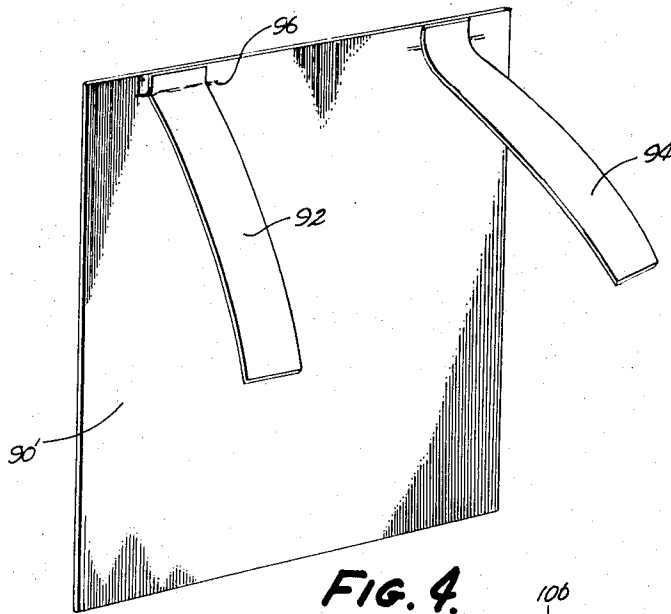


FIG. 4

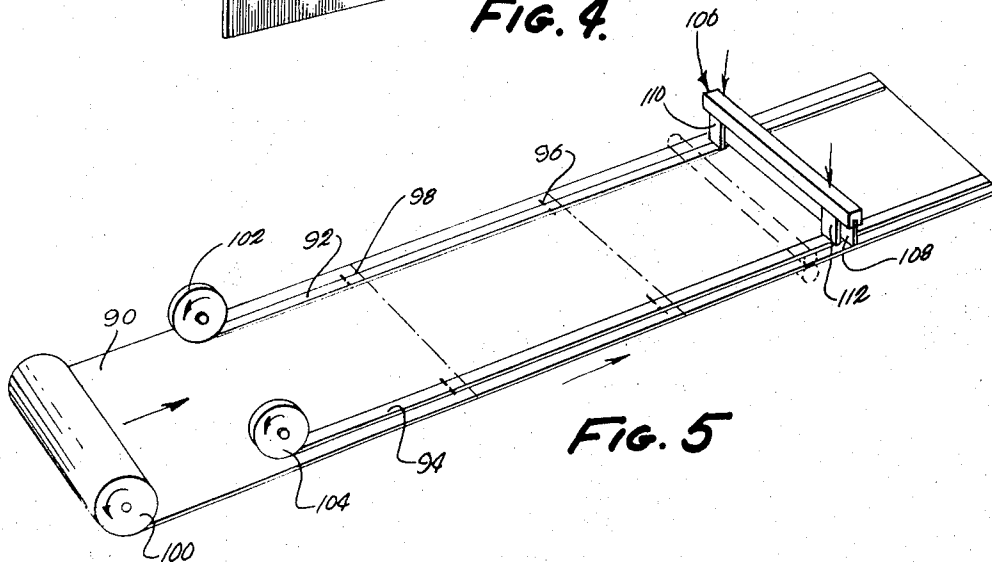


FIG. 5

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METHOD OF MAKING A PLASTIC CLOTHES PROTECTOR

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Original application Jan. 17, 1963, Ser. No. 252,222, now Patent No. 3,146,465, dated Sept. 1, 1964. Divided and this application Feb. 7, 1964, Ser. No. 350,138
3 Claims. (Cl. 156—204)

ABSTRACT OF THE DISCLOSURE

A method of forming a disposable plastic bib with extendible tie means, out of a continuous web of plastic and a continuous strip of plastic, including the steps of cutting spaced slits parallel to and spaced from a web edge, positioning the strip along the web edge so that it is straddled by the slits and the web edge, and transversely melt-severing the web and strips at intervals, in the middle of said slits.

This invention relates to bibs, and more particularly to novel disposable plastic bibs, and to methods of rapidly and inexpensively forming disposable plastic bibs from a continuous strip of plastic sheet material.

This is a divisional application of my co-pending application entitled, Plastic Bibs and Method of Making, filed Jan. 17, 1963, Ser. No. 252,222, now U.S. Patent No. 3,146,465.

The notoriously messy eating style of children necessitates the employment of bibs. Various types of washable bibs are available for home use. When eating in public, however, these bibs are usually not available, and if carried from home constitute a real nuisance. The problem is especially acute when dining in public because children are usually adorned in their best attire.

Similarly, adults dining on foods such as lobster or spaghetti are also confronted with the problem of trying to make epicurian pleasures consistent with delicate, often largely ineffective eating habits. The result is that a sacrifice is almost invariably required, i.e. clothes will become soiled and require cleaning, or costly tie-on cloth napkins requiring subsequent washing will be employed, or the meal will not be fully enjoyed.

In efforts to provide inexpensive, disposable bibs, various types of paper products have been adopted heretofore. However, in order to provide paper bibs with waterproof characteristics, the expense becomes very substantial. Further, paper is usually not comfortable to the skin, and can be the cause of a public disturbance when tied on the necks of small children in a restaurant.

The obvious solution would appear to be the use of plastic bibs. Heretofore, however, as far as is known, no manufacturer has been able to provide a plastic bib that is sufficiently low in cost and therefore in price to be disposable after a single use.

It is therefore an object of this invention to provide a novel plastic bib that is completely effective as a bib since it is completely waterproof, is soft and pliable to the touch, effectively covers a large area of the person, is easy to attach, is attractive, catches and retains dropped and spilled food and drink, and yet is so inexpensive that it can be disposed of after only one use, with complete economic justification. The bib does not require a large initial cash outlay to purchase large quantities, as compared to prior types. It requires no laundry expense since it can be thrown away at a smaller cost. In fact, the small cost of the bib can be completely balanced by the goodwill advertising resulting therefrom. The bib is usable on

very small children, on larger children, or, in a larger size on adults, as is necessary.

It is another object of this invention to provide a method of manufacturing plastic disposable bibs in a rapid manner with a minimum of equipment and labor, and to do this so inexpensively that the bibs are disposable after one use, with complete economic justification. The method is readily adapted to complete automation, to actually require no human labor other than normal maintenance and setup.

These and other objects of this invention will be apparent upon studying the following specification in conjunction with the drawings in which:

FIG. 1 is a perspective view of the preferred form of novel bib;

FIG. 2 is a perspective view of a method of continuously forming bibs slightly different from that in FIG. 1;

FIG. 3 is a fragmentary, perspective view of the method in FIG. 2 slightly modified to form bibs as in FIG. 1;

FIG. 4 is a perspective view of a second form of plastic bib; and

FIG. 5 is a perspective view of a novel method of continuously forming the bib in FIG. 4.

Basically, the inventive preferred bib comprises a plastic sheet with the upper end folded downwardly over a portion of one side of the sheet and the lower end folded upwardly over a portion of the opposite side of the sheet, the edges of both flaps or folds being fused to the sheet, and a cutout along the upper fold line to provide an opening, so that the bib can be slipped over the head of a child, with the lower fold comprising food catching pocket. Preferably, an additional strap has its ends fused to the opposite edges of the upper end of the bib so that by severing the strap in the center, two ties are formed to tie the bib around the neck of a child.

The preferred method of manufacturing of the bib comprises the steps of continuously unrolling and conveying a continuous sheet of thin plastic, continuously folding one edge of the sheet over a portion of one side of the sheet, continuously folding the opposite continuous sheet edge over a portion of the opposite side of the sheet, die-cutting spaced sections of one fold and adjacent sheet body at spaced intervals to form slipover openings with adjacent shoulder support areas, and transversely severance melting the sheet and folds with a heated blade, to form it into equally divided section along lines spaced between the cutouts while simultaneously fusing the newly cut sheet edges and fold edges together. Thereby the cut folds comprising a slipover collar with adjacent shoulder rest areas, and the second fold comprising a catch pocket, are instantly formed with the severance step. Preferably, a continuously narrow plastic strip is also unrolled along one of the folds and is severance melted, and fused, simultaneously with severance melting and fusing of the fold edges. Division of the strip on each bib into two parts forms a pair of ties.

In another form of the invention, especially for adult bibs, this method comprises the steps of continuously unrolling and conveying a continuous sheet of fusible plastic beneath a cutting blade and fusion means, simultaneously unrolling two thin continuous strips of plastic fusible to the sheet plastic, along opposite edges of the sheet so as to also be conveyed beneath the blade and fusion means, and periodically transversely cutting said sheet and strips by lowering the blade with simultaneous fusing of the severed edges of the strips to one severed end of the sheet to thereby continuously form identical bibs with ties.

Referring now specifically to the drawings, in the preferred form of the invention illustrated in FIG. 1, the bib 10, intended mainly for children, comprises a

body sheet blank 12' of soft pliable flexible plastic such as a high density heat fusible polyethylene polymer. The lower end of bib 10 is folded upwardly along the front portion thereof, i.e. along a portion of one side to form a flap 14'. The flap is sealed at edges 16 and 18 to sheet 12' by fusion. On the upper end of the bib is a second flap 20' folded over a portion of the back of the bib, i.e. over a portion of the opposite side. It is also fused at its edges 23 and 24 to main sheet blank 12'. An opening 26 is provided in the center along fold line 28 of the upper flap or fold 20', to receive the head of a child, with the adjacent uncut fold portions along fold line 28 comprising shoulder rest areas to support the bib in a collar-like fashion on the child. The slit or cut-out to form opening 26 is preferably formed by die-cutting techniques in the novel process, but may be formed by other slitting or cutting steps.

The completed bib 10 may also include a pair of plastic ties 30 and 32, which, in the preferred method, are formed from a continuous heat fusible, plastic strip severed in the middle. Opposite the free end of the ties, the outer end of each tie is fused to body sheet 12' and fold 20'. Thus, the bib may be used on a child merely by slipping the opening over his head so that pocket 34 formed by flap 14 fused at its ends will catch food and drink dribbled down the front of the child. Alternatively or as a supplement thereto, ties 30 and 32 may be fastened around the neck of the child. Fold or flap 20' and main sheet 12' are also slit along severance lines 22 inwardly from the side edges of the bib. This enables the ties 30 and 32 to be secured around the neck of the wearer with greater comfort since the slits in effect increase the length of the ties without requiring the initial tie-strip to be longer than the width of the bib. The bib area below the slits effectively cover the user. After the bib is used, it is disposed of by burning or the like.

Method

To form the bib in FIG. 1 without the tie members 30 and 32, the method illustrated in FIG. 2 is used. The soft, thin polyethylene plastic sheet has a width greater than the final length of the bibs, i.e. equal to the length of the bib plus the folds. The sheet 12 is continuously unrolled from a conventional roll 50 and conveyed along on suitable conveyor means (not shown) as propelled by friction rollers or other equivalent means (not shown). First, one continuous edge of the plastic is folded underneath along the one side to form a continuous fold 20 on the plastic sheet 12. This may be done by any conventional method, for example by a diagonal finger 56. Then the opposite continuous edge is folded over the opposite side of the continuous sheet 12 to form a second continuous fold 14. Again this may be done by a conventional diagonal finger 60 or with any other suitable equivalent technique well-known to those in the plastic sheet handling art.

The second fold 14 is then die-cut at spaced intervals by a reciprocating die 62 having a slightly arcuate cutting blade 64, to sever a portion of fold 14 and the adjacent sheet portion to form head-receiving openings along the sheet. Accuracy of cuts is achieved by moving the sheet in intermittent fashion with periodic momentary stops between the shifting movements. As the sheet travels on, a heated dull melting severance blade 68 positioned transversely of sheet 12, and mounted to reciprocate with respect thereto, is lowered to contact the sheet and folds at intervals along severance lines 70 spaced between cut-outs 72. The blade 68 is at a sufficient temperature to melt the plastic depending upon the plastic material used. It also has a width of a few thousandths of an inch on the edge so that it actually melts its way through rather than shearing the plastic. The heated blade melts the plastic completely through to thereby sever the continuous sheet into equal sections, and to also simultaneously fuse the edges of the folds to the adjacent, newly-cut sheet

edges on opposite sides of the blade. Thus, as the bib leaves the area of blade 68 when the blade is raised, it is complete in the form illustrated in FIG. 2, so that it includes a pocket formed by fold 20 and a collar portion with an opening 26 formed by fold 14. The entire forming process consumes only a matter of a few seconds, and is accurately, repeatedly, dependably performed by the simple relatively few equipment components required.

In FIG. 3 is shown a slightly modified method of FIG. 2 to provide tie straps 30 and 32 to the bib as illustrated in FIG. 1. In this form of the invention, the diagonal fingers 56 and 60 again fold over the continuous edges of the sheet 12 to form the continuous folds 20 and 14. Again the cutouts 72 to form the neck openings are formed, preferably by the arcuate cutting die blade 64 as it reciprocates at spaced intervals along the sheet.

Prior to passage of the sheet beneath cutter blade 64, flap 14 and the underlying main sheet pass beneath blade 68 which reciprocates vertically. As the sheet stops momentarily, blade 68 lowers against stop blade 35 of brass or the like to slit the flap 14 and underlying sheet body across the imaginary line 70 (shown in phantom) which later divides the bibs after action of heated blade 68. Subsequent to passage of the sheet by the cutter blade 64, a thin narrow strip 80 of plastic, fusible to sheet 12 and preferably of the same material, is continuously conveyed onto the fold 14 from a roll 82 of the plastic strip. Thus, as the plastic strip rests upon fold 14 and is conveyed beneath the heated fusion blade 68, the heated blade reciprocates and contacts the plastic. The blade not only melts and severs sheet 12 and folds 20 and 14, but also melts through continuous strip 80 to form it into sections of the same width as the bib. The ends of the strip are also simultaneously fused to the severed folds 14 and the sheet portion along the edges to form an integral structure. To form the pair of ties 30 and 32 from the single piece of strip 80' fused at the opposite ends to the edges of the completed bib, it is divided in the center by ripping it or cutting it as required.

The slits 22 then extend inwardly from the opposite sides of each bib to effectively lengthen the tie straps without requiring an initially longer tie strip length. The width of stop plate 35 determines the slit length so that it can readily be varied.

Modification

In FIGS. 4 and 5 is illustrated another form and method of forming a plastic bib especially suitable for adults when eating foods such as lobster, spaghetti, etc. The body of this bib is substantially larger. It is composed of a plastic flexible soft pliable sheet blank 90' and a pair of fusible plastic ties 92 and 94. Each of the ties is fused at one of its ends to the upper end of sheet 90' adjacent opposite edges of the sheet, or spaced slightly therefrom a desired amount. The fusion may be at positions 95 spaced from the upper edge of sheet 90' and achieved by heated dies lowered into contact with the two portions. Alternatively, it may be desirable in some instances to fuse the very end of the strips to the very upper edge of sheet 90' simultaneously with melting severance of the sheet into equal portions according to the principles shown and described with respect to FIG. 3 above.

In FIG. 5 the novel method of forming the bib in FIG. 4 is shown. It includes the steps of unrolling a continuous plastic sheet 90 from a roll 100 of fusible plastic sheet material along a suitable conveying means (not shown) driven by suitable conventional plastic sheet drive means such as friction rollers or the like. As sheet 90 is being conveyed, continuous strips 92 and 94 of fusible plastic material, preferably the same as the material in sheet 90, for example high density polyethylene, is unrolled from spaced rolls 102 and 104 along the opposite edges of the continuous sheet to be carried thereby. All three of these continuous strips of material are conveyed beneath a blade means 106 which reciprocates into contact with

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the sheets to both sever the sheets into equal bib lengths, and simultaneously fuse the strips 92 and 94 to the sheet while cutting the strips also. Depending upon the thickness of the strip material involved, the blade itself 108 may itself be heated as in first form of this invention, so that the blade melts through the plastic, both the strips, and the sheet, and simultaneously fuses the strips to the sheet. Alternatively, as shown, a pair of heated metallic fusion die elements 110 and 112 may be mounted adjacent the blade to preferably reciprocate therewith to fuse the strips to the sheet at point 96 adjacent and slightly spaced from severance line 98, i.e. the upper edge of the one bib and the lower edge of the adjacent one. It will be noted that this process is simple, requires only a few conventional components, and may be rapidly conducted to form inexpensive disposable plastic bibs at a tremendously high rate of production.

It is realized that various obvious modifications in the selection and arrangement of equipment components may be utilized in practicing the principles of this invention as taught. Also, many other plastic polymers or co-polymers may be used instead of the polyethylene family mentioned, such as polyvinyls, acrylics, etc. within the broad concept presented, provided each particular polymer selected has the capacity for being melt-severed and fused as taught, and has sufficient softness and flexibility to be comfortable as a bib. Any obvious changes in details of this invention, as long as falling within the principles as taught, are deemed to be part of this invention, which is to be limited only by the scope of the appended claims and the reasonably equivalent structures and methods to those defined therein.

I claim:

1. A method of rapidly forming a large number of disposable plastic bibs, comprising the steps of conveying a continuous sheet of plastic, unrolling a continuous narrow strip of plastic fusible to said plastic sheet along one edge of said sheet; cutting said plastic sheet at intervals in slit lines parallel to the edges of said sheet and alongside said strip toward the sheet edge opposite said one edge so that said slits and one edge straddle said strip; and transversely melt-severing said sheet and strip by pressing a heated cutting die against said strip and sheet at equal intervals in the middle of said slits while simultaneously fusing the ends of said strip to the newly cut edges of said sheet, said strip when divided forming a pair of ties, the effective length of said ties being increased by said slits.

2. A method of rapidly forming a large number of disposable plastic bibs, comprising the steps of, unrolling and conveying a continuous sheet of plastic, continuously folding an edge of said sheet over a portion of one side of said sheet, intermittently slitting said sheet longitudi-

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nally along its edge opposite said fold parallel to said edge, but spaced therefrom, at spaced intervals, unrolling a continuous narrow strip of plastic fusible to said plastic sheet along said opposite edge of said sheet and between the slits and said opposite edge, and transversely severing said sheet, fold, and strip into equal sections along spaced severance lines on the spaced slits while simultaneously fusing the newly cut edges of said sheet to said fold edges and to said strip ends to form a complete bib with said fold forming a catch pocket, and said strip when divided, forming a pair of ties, the effective length of said ties being increased by said slits.

3. A method of rapidly forming a large number of disposable plastic bibs, comprising the steps of, unrolling and conveying a continuous sheet of plastic, continuously folding an edge of said sheet over a portion of one side of said sheet to form a folded edge, continuously folding the opposite continuous sheet edge over a portion of the opposite side of said sheet to form a second folded edge, longitudinally slitting one of said folds and adjacent sheet portion at spaced intervals near to, parallel to, but spaced from the adjacent folded edge; cutting said one fold and sheet portion to a depth partially across said one fold at spaced intervals intermediate the spaced slits to form spaced intervals intermediate the spaced slits to form spaced openings; unrolling a continuous narrow strip of plastic fusible to said plastic sheet, along said cut fold, between the slits and adjacent folded edge, and transversely melt severing said sheet, folds, and strips into equal sections along severance lines spaced between the cuts on the spaced slits while simultaneously fusing the newly cut sheet edges, fold edges, and strip ends together to form a complete bib having a catch pocket, having a slipover collar construction with said cuts, and capable of having a pair of ties by dividing said strip in the center, said ties being effectively lengthened by said slits.

References Cited

UNITED STATES PATENTS

2,174,694	10/1939	Elson	2—49
2,424,680	7/1947	Doyle	2—52
2,444,685	7/1948	Waters	156—583
2,873,566	2/1959	Sylvester et al.	156—202
2,949,611	8/1960	Wilkaitis	2—243
3,035,381	5/1962	Hosso	156—251
3,099,237	7/1963	Currin et al.	93—35
3,147,674	9/1964	Hoepfher	93—35
3,231,898	2/1966	Yablon	2—48

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