Nov. 16, 1971 S. H. COWEN 3,619,816

CONTOURED NECK TOWEL

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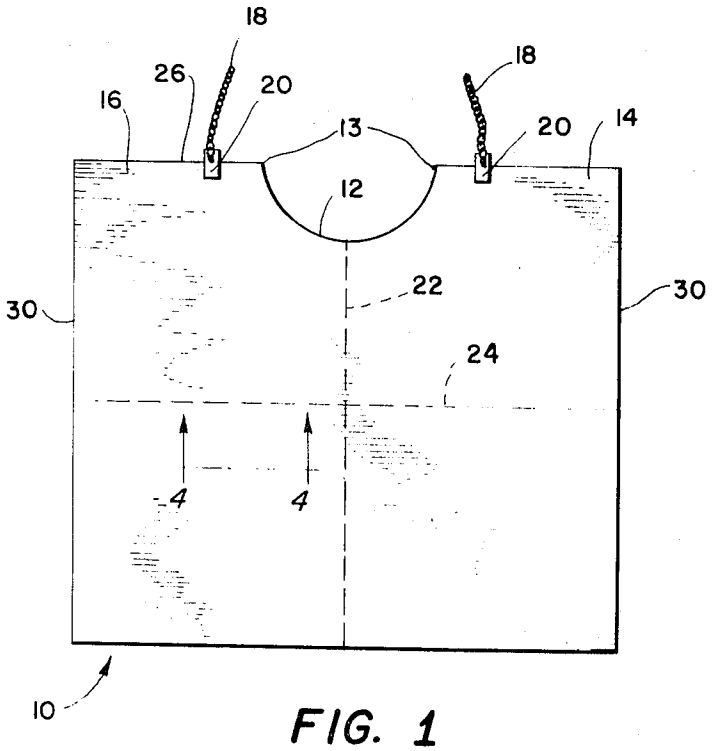


FIG. 1

FIG. 2

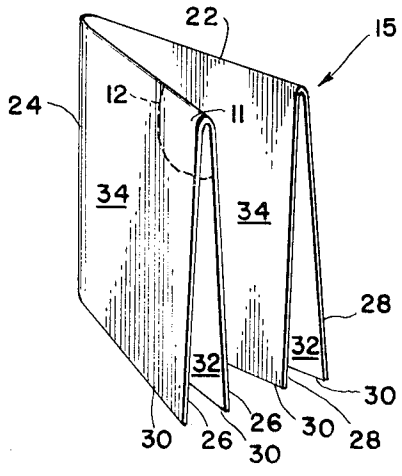
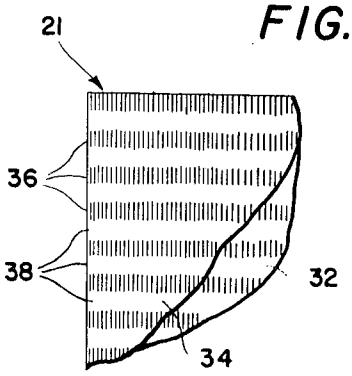


FIG. 3



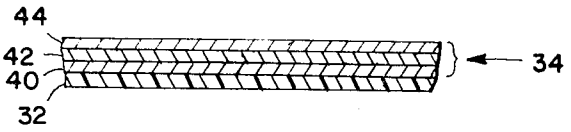


FIG. 4

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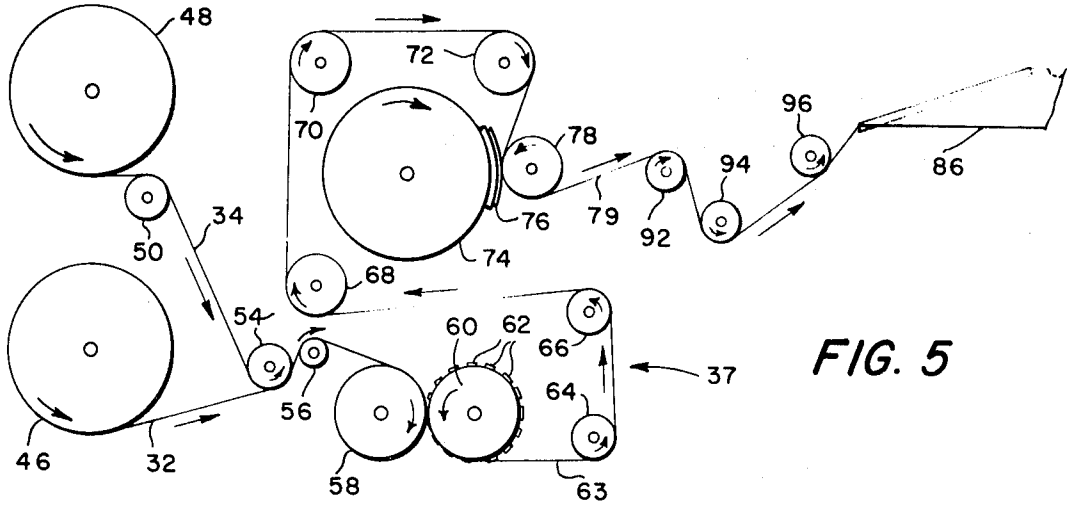


FIG. 5

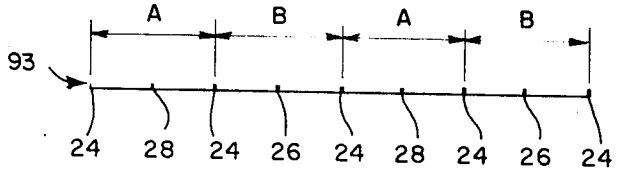


FIG. 8

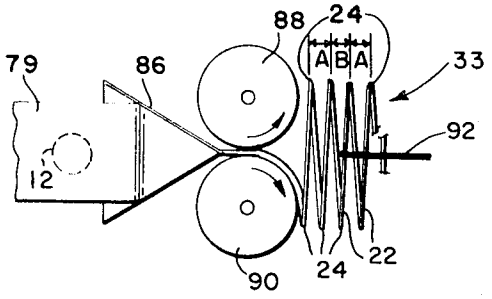


FIG. 6

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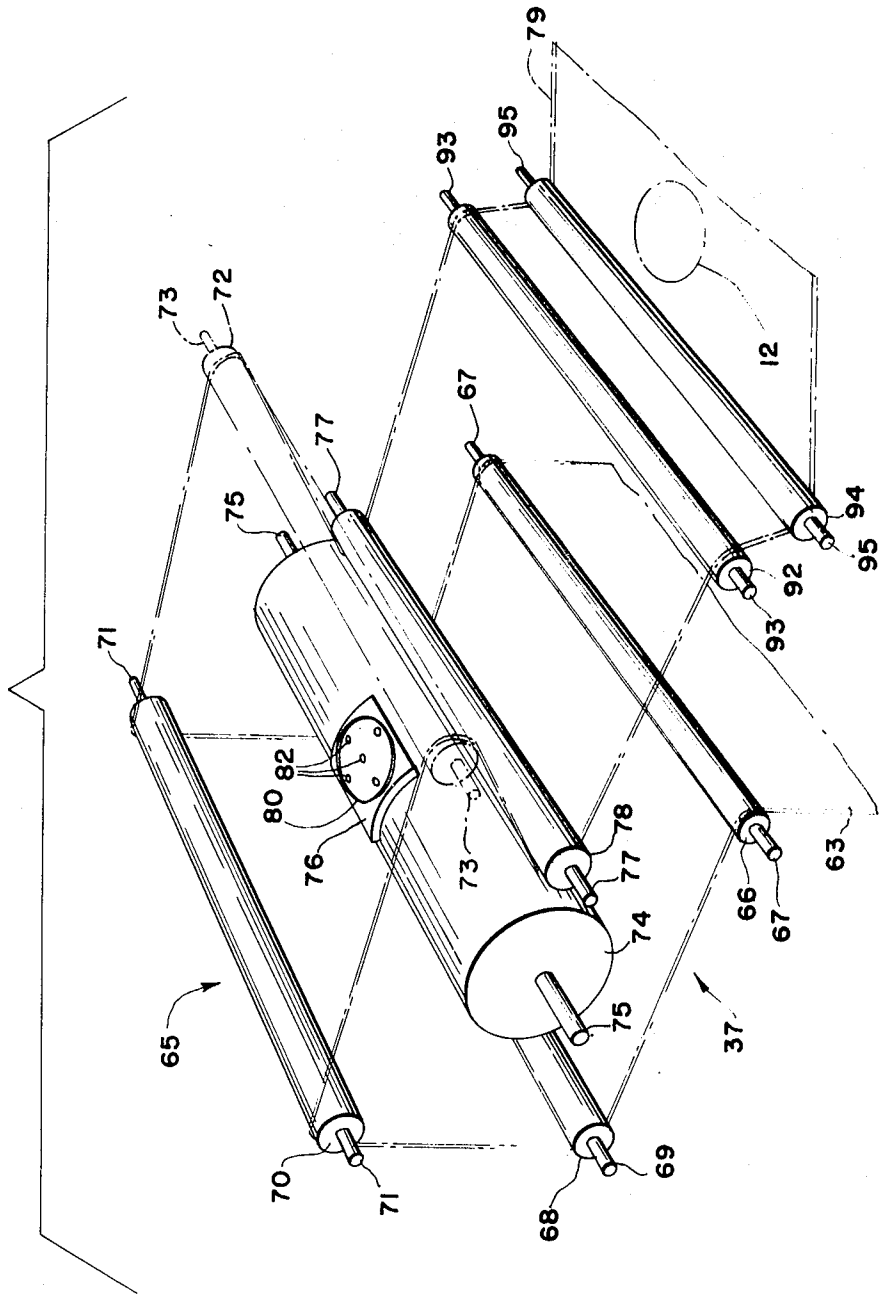
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FIG. 7



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CONTOURED NECK TOWEL

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Int. Cl. A41d 13/04; B32b 27/10
U.S. Cl. 2—49 2 Claims

ABSTRACT OF THE DISCLOSURE

A folded contoured neck towel is disclosed which is formed of a laminate of absorbent paper and liquid-impervious plastic. The towel is particularly folded and constructed such that a corner portion may be readily removed prior to use as a protective bib.

The present invention relates to a laminated contoured neck towel, to a process for the formation of the towel and to an apparatus for perforating a laminated towel.

Practice of the present invention provides a thin, flexible neck towel having an absorbent paper-like layer and a liquid-impervious plastic-like film on one surface thereof. The towel may be easily and inexpensively formed by the present continuous process for rapidly producing large numbers of the neck towel, each in a folded configuration convenient for compact storage. Perforating apparatus provided by this invention is especially applicable to the process for producing the present contoured neck towel. The present towel may be usefully and readily adapted as a drape for covering and protecting clothing on the front portion of the upper torso of a dental patient or the like.

Generally stated, the present invention provides a contoured neck towel formed of a paper-plastic laminate having a readily detachable, generally semicircular section. The detachable section adjoins a finally used main portion of the towel at an arcuate, perforated border which is generally shaped to the contour of a human neck. The present towel may conveniently be used as a protective bib for clothing worn on the front upper torso of a person, such as a dental patient, by detaching the removable section, positioning the main portion on the front upper torso clothing and preferably thereafter securing the towel in position. The present process generally includes the steps of superimposing an absorbent paper-like layer on a plastic-like film and adhering the layer to the film to form a laminated sheet. Thereafter, the laminated sheet is perforated by cutting with a generally circular perforating die. The perforated sheet is then longitudinally folded and subsequently transversely folded in an alternating fashion to produce a longitudinally folded laminate of a shape which may be described as accordion in nature. The thus perforated and folded sheet is next alternately transversely severed (A) along a line which includes a diameter of the area enclosed by the perforation and (B) along a line which is midway between consecutive perforated sections of the sheet.

The apparatus provided by the present invention, broadly stated, is an assembly for providing a generally circular perforation in a thin, flexible laminated sheet. Included in the apparatus are a first rotatable cylinder having a perforating member thereon and a second rotatable cylinder, spaced from the first rotatable cylinder for supporting a laminated sheet portion to be perforated.

Practice of the present invention will become more apparent from the following detailed description taken in connection with the accompanying drawings wherein like numerals refer to similar parts throughout the several figures.

FIG. 1 is a front view of an embodiment of the present contoured neck towel ready for use;

FIG. 2 is a perspective view of the contoured neck towel of FIG. 1 in folded configuration prior to being readied for use;

FIG. 3 is a partial front view of an embossed laminated contoured neck towel showing an absorbent layer and a liquid impervious layer of the laminate;

FIG. 4 is an enlarged partial cross-sectional view taken at line 4—4 in FIG. 1;

FIG. 5 is a schematic illustration of an initial phase of the present process;

FIG. 6 is a schematic illustration, normal to FIG. 5 of a final phase of the process and includes a side edge view of a longitudinally and transversely folded laminated sheet;

FIG. 7 is a perspective view of the perforating apparatus of the present invention; and

FIG. 8 is a schematic edge view of the folded portion of the laminated sheet of FIG. 6 in an unfolded configuration.

In FIG. 1 there is shown contoured neck towel **10** in an embodiment of generally rectangular shape bordered by top edge **26**, bottom edge **28**, and two side edges **30**. Imaginary center line **22** is shown parallel to sides **30** and midway therebetween. Towel **10** has arcuate indentation **12** adjoining top edge **26** at points **13** thereon which are spaced equally distant from the intersection of an extension of center line **22** with a line colinear with top edge **26**. Towel **10** includes shoulders **14** and **16** in opposite upper regions thereof, which are separated by indentation **12**.

The towel is formed of a laminated construction which includes a layer of an absorbent material such as tissue paper or the like having adhered thereto a liquid impervious film consisting of plastic or the like. As shown in FIG. 4 the laminate may include tissue paper **34** having adhered to a surface thereof plastic film **32**. Paper **34** may be formed of a tissue paper construction having one or more plies, preferably of facial grade tissue. The strength and absorbency of paper layer **34** increases with the number of plies of tissue, as does the expense of the towel. The weight of the paper suitable for use in the laminate depends upon the number of plies to be used. If only a single ply of tissue is to be used to form the laminate, 10–16 pound tissue paper should be used. If two or more plies are to be used, 8–16 pound tissue paper should be used. Up to four plies of facial grade tissue paper may be used. The paper layers should be integrally associated to form an intact sheet composed of these several layers as is conventional with facial tissue. The preferred tissue paper is a 12 pound racial grade tissue paper, and this weight of paper forms an exceptional towel material when laminated to polyethylene film having a thickness of about one mil. Because the use of three-ply tissue paper is found to provide an effective inexpensive towel, paper layer **34** is illustrated as a preferred embodiment having plies **40**, **42** and **44**.

Although plastic film **32** may be formed of numerous plastic materials, thermoplastic materials are found particularly suitable. Examples of suitable thermoplastic materials for this invention include nylon, polyvinyl chloride, polyesters, polyolefins and the like. Polyethylene is preferred for its ready availability and low cost. Preferably the film is a preformed polyethylene film having a thickness of at least 0.5 mil, and preferably about one mil.

Plastic film **32** may be bonded to paper **34** in a variety of useful ways including, for example, embossing. In FIG. 3 there is shown portion **21** of an embodiment

of a construction of towel **10** having plastic film **32** adhered to paper **34** by a plurality of embossed strips **36** which appear in alternate fashion with non-embossed strips **38** therebetween.

During the period between manufacture and use of towel **10**, storage space may conveniently be utilized by folding towel **10** generally into four quarters as shown in FIG. 2. It will be noted that the folded towel is illustrated in FIG. 2 in partly opened form for clarity, whereas in practice the folded towel is stored in substantially flat configuration. Towel **10** therefore is conveniently folded first along center line **22** and then along line **24** which is generally normal to line **22** and is approximately mid-way between top edge **26** and bottom edge **28**. Prior to being readied for use, towel **10** includes generally semicircular section **11**, which is enclosed by top edge **25** and arcuate perforated edge **12**. Although nearly half of section **11** is hidden from view in FIG. 2, its shape will be clearly understood by realizing that it is generally symmetrical about line **22**.

Towel **10** may usefully protect a dental patient's clothing from bloody saliva and other offal normally encountered in the practice of dentistry. Towel **10** may be readied for such use in less than a minute by ripping along perforation **12** to remove section **11** and unfolding the towel into the shape shown in FIG. 1. Ripping and unfolding may be effected in either order, but preferably as given. The towel, which now appears as in FIG. 1, is next placed on clothing worn by the patient over the front of his thorax section and is positioned with identation **12** approximately superimposed on a contour neck line common to this throat and his trunk. Placement is preferably with the plastic-like layer adjacent the clothing. Thereafter, holding means such as string **18**, having affixed thereon at the two extremities thereof clamps **20**, is attached to top edge **26** of towel **10** by attaching one of clamps **20** to shoulder **14**, passing string **18** behind the patient's neck, not shown, and securing the other of clamps **20** to shoulder **16** of towel **10**. The length of string **18** may be adjusted to position identation **12** at a desired distance from the patient's neck.

Although the towel of the present invention may be formed in numerous shapes and sizes the following dimensions are given, by way of illustration, for towel **10** of FIG. 1. A width of the towel, as at line **24**, desirably ranges from about 12 to about 30 inches, preferably about 20 inches. The distance between top edge **26** and bottom edge **28** desirably ranges from about 10 to about 30 inches, preferably about 16 inches. Arcuate identation **12** may have a radius of from about 2 to about 5 inches, preferably about 3 inches. Useful thicknesses of the absorbent material and the liquid imprevious film thereunder depend on the specific materials in the laminate. Three ply issue paper having an overall thickness of about 0.01 to about 0.05 inch is generally found to be sufficiently absorbent. Polyethylene film ranging from about 0.001 to about 0.005 inch in thickness provides a suitable liquid impervious film.

Although the present towel may be formed by any suitable means, a particularly suitable process for forming the towels in mass production is also provided by this invention. The process will be described with reference to forming a laminated towel composed of a paper layer and a plastic film. As shown in FIGS. 5 and 6, from plastic sheet supply roll **46** is unrolled a short section of plastic film **32**, and from absorbent paper supply roll **48** is withdrawn sufficient paper **34** to reach roller **54**. Laminated sheet **37**, which comprises plastic sheet **32** and paper sheet **34**, is threaded around the various rollers, as shown, to driving rolls **88** and **90**. A continuous, periodically folded laminated sheet portion **33** is delivered therefrom and is thereafter severed into prefolded contoured neck towels of the present invention by cutting means illustrated as blade **92**.

Laminate portion **35** is first formed of paper sheet **34** received from paper supply roll **48** via guide roll **50** and from plastic film **32** received from supply roll **46**, by laminating rolls **54** and **56**. Laminate portion **35** then passes through adhering rolls **58** and **60** where plastic film **32** is adhered to paper layer **34** as by embossing with relief strips **62**. The now adhered laminate next passes over one or more guides illustrated as guide rollers **64**, **66**, **68**, **70** and **72**, around which the laminate is maintained in proper tension by any convenient means. The adhered laminate then passes between perforating roller **74** and dummy roller **78**. Roller **74** is provided with means **76** for perforating laminates formed of a paper layer and a plastic film. In this step the laminate receives perforated contour line **12** for two contoured neck towels juxtaposed on the laminate and having top edge **26** in common. Thereafter perforated laminate portion **79** is passed around guide and tension rollers, such as rollers **92**, **94** and **96**, to longitudinally folding means illustrated diagramatically as A frame **86**, where the perforated sheet is folded longitudinally along a center line thereof corresponding to line **22** on a single towel in FIGS. 1 and 2. The longitudinally folded sheet then passes between drive rollers **88** and **90** which alternately transversely fold the sheet as at line **24** shown for a single towel in FIGS. 1 and 2. The thus processed sheet is delivered from rollers **88** and **90** in a configuration which view from edge **22**, as shown, may be described as of accordion shape or of a high frequency saw-tooth wave pattern. The thus processed sheet of laminated towels is then transversely severed, as at top edge **26** and bottom edge **28** of towel **10** by cutting means **92** which is preferably a conventional reciprocating saw blade. Other cutting means known to the art may be used, as desired.

The relative orientation of consecutively produced and adjoining towels disposed in the wave-like configuration of FIG. 6 on folded portion **33** of laminated sheet **37** are further illustrated in FIG. 8, wherein the "wave" is shown outstretched. By referring to FIGS. 1 and 8 it will be seen that repeated portion A–B–A–B of the uncut sheet contains therein a sequence of units such as a first towel **10** adjoined to a second towel **10** at common top edge **26**. To the second towel **10** there is adjoined a third towel **10** at common bottom edge **28**. Edges **26** and **28** are subsequently cut by cutting means **92** against which the advancing sheet is forced by energy derived from rolls **88** and **90**.

The apparatus of this invention is an assembly for perforating an advancing sheet of thin laminate formed of at least one layer of a plastic film which is adhered to a surface of at least one layer of paper-like material.

Although the present apparatus may be used for perforating various designs in numerous such laminates for a variety of purposes, the apparatus will be illustrated herein with reference to forming perforated circles in a relatively long continuous sheet from which large numbers of the present laminated contoured neck towel may be formed. Such an embodiment is shown in FIG. 7 as perforating apparatus **65** having laminated sheet **37** threaded therethrough. Apparatus **65** includes as an essential element thereof relatively large and generally cylindircal roller **74** which is desirably slightly longer than a width of laminated sheet **37** to be perforated by the apparatus. Roller **74** has projected therethrough small diameter rod **75** which protrudes from the center of each of two opposite generally circular side sections of the roller. The protruding portions of rod **75** are for supporting roller **74** in unshown sprockets in a frame therefor, at least one of which sprockets is desirably provided with means for rotating, at a preselected speed, roller **74** in synchronism with drive means for such sprockets and with advancing laminate **37**. Roller **74** is also provided with one or more die plates such as rectangular arcuate plate **76** on a cylindrical surface of the roller. Plate **76** includes a cutting member such as sharp edged discon-

tinuous circular ridge **80** which extends radially outward from arcuate plate **76**. Ridge **80** may be formed of, or coated with, any durable, edge-retaining material, preferably a metal alloy such as case hardened stainless steel, Stellite (a trade marked alloy by Union Carbide Corporation) or the like. Plate **76** may be secured to roller **74** by any conventional means such as a plurality of threaded fasteners **82**.

Apparatus **65** includes small cylindrical roller **78** against which laminate portion **63** to be perforated is pressed by sharp edged ridge **80** for cutting perforated circle **12** in the laminate. Roller **78** is also provided to maintain sufficient tension on laminate **37** to ensure proper perforation thereof. Roller **78** is provided with rod **77** similar to rod **75** for supporting thereof.

Means not shown are desirably provided to maintain a controlled preselected spacing between rollers **74** and **78** for suitable perforation of the laminate.

Apparatus **65** further includes a plurality of rotatable cylinders such as small rollers **66, 68, 70** and **72** for guiding and maintaining tension on laminate **37** prior to perforation thereof. The rollers are affixed with sprocket insertable rods, **67, 69, 71** and **73** in a manner similar to rods **75** and **77**. Similar rotatable cylinders for guiding and maintaining tension on laminate **37** after perforation thereof are provided, such as small rollers **92** and **94**, similarly equipped with rods **93** and **95**.

The rotatable cylinders of the present apparatus may be formed from numerous materials including ceramic, wood, rubber and various metals. The rods are desirably formed of steel or other durable alloys which tend to provide long periods of trouble free operation.

It is to be realized that the foregoing description is given merely by way of illustration and that various modifications may be made thereto without departing from the spirit of this invention.

What is claimed is:

1. A folded contoured neck towel which consists essentially of a laminate having at least one layer of an absorbent paper-like material adhered to at least one layer of liquid-impervious plastic, said laminate folded in half along a first fold line, and folded again in half along a second fold line perpendicular to said first fold line, a perforated arcuate line disposed from said first fold line through the two adjacent laminates forming the first fold line and to the outer edges thereof opposite said second fold line.

2. The folded contoured neck towel of claim **1** wherein the laminate is formed of three-ply of 8–16 pound facial grade tissue paper, adhered to a layer of polyethylene film having a thicknes of about 1 mil.

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WILLARD E. HOAG, Primary Examiner

U.S. Cl. X.R.

161—108, 112, 250, 270