SYSTEM AND APPARATUS FOR CREATING A HEM

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ABSTRACT

The present invention relates to a consumer-portable dual hem ironing unit including at least a first and a second ironing unit members and a mechanism for grasping and retaining a first and a second material fold (first and second hems) during an ironing of the folded material. The consumer-portable design allows users to reposition either the unit or the material along an unfinished length of material and form a uniform continuous double rolled hem configuration. Adjustable measurement guides allow for hem accuracy and alternative configurations provide steam supply and steaming options. Alternative heavier-use embodiment enables securing to a table edge and includes an enhanced water capacity for improved steam generation. Multiple mechanisms are provided for gripping the folded material during a use and thermal and fluid flow controls allow control of double rolled hem pressing across a wide palate of fabric and flexible material types.
Fig. 5
Fig. 14
SYSTEM AND APPARATUS FOR CREATING A HEM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from U.S. Prov. App. Ser. No. 60/821,440, filed Aug. 4, 2006, the entire contents of which are herein fully incorporated by reference.

SELECTED IMAGE FOR PUBLICATION

[0002] FIG. 1

BACKGROUND OF THE INVENTION

[0003] 1. Field of the Invention

[0004] The present invention relates to a consumer device for forming a double rolled hem. More specifically, the present invention relates to one of a hand held and self-supporting double rolled hem iron allowing a user to adjustably press-form a double rolled hem along a length of textile.

[0005] 2. Description of the Related Art

[0006] Double rolled hems are used throughout the textile, clothing, fashion and design fields to dress the raw edge of woven and non-woven materials and sheet goods, prevent edge fraying (with woven materials), minimize edge damage (with weaker materials like silk), generate a strengthened portion of a sheet (for grommeting the installation of grommets), other sewing steps, or to secure a weight. A single rolled hem (a single fold) fails to provide the additional strength of a double rolled hem, and of course, fails to provide a neat, clean, or finished edge to the first of the two hems in a double hem circumstance resulting in a displeasing appearance.

[0007] A double rolled hem provides not only a pleasing appearance, strengthens the edge etc. A double rolled hem remains the hallmark of quality and skilled craftsmanship. As a consequence, the combined textile, clothing, fashion, and design industries have a continual and persistent need to create double rolled hems in a swift and economic manner for a wide variety of materials.

[0008] Unfortunately, as will be described, the creation of a double rolled hem is nearly always the result of either (a) complex machinery or (b) skilled hands, each of which ultimately conduct the following labor-intensive steps:

[0009] 1. Preparing the fabric by initial smoothing with a flat iron.

[0010] 2. Define a first “fold over” or roll measurement (commonly ½ inch) and then fold or roll over (by hand or machine) an initial short length about six inches of fabric edge to define the first hem line distance.

[0011] 3. Press the first folded ½ inch thick six inch (for example) length “fold over” edge with a hot iron to define a first hem line (a first “measure-press” step)

[0012] 4. Repeat steps 1-3 by hand along the entire length of fabric until the first fold over or roll hem is created, measuring every 4 inches or so in length to ensure the first roll hem edge is straight and clean without undulation.

[0013] 5. Upon completion of the first “fold over”, pins are often inserted to hold the first “fold over” in place, and the process is repeated by forming a second “fold over” also employing the roll measurement (commonly ½ inch) by folding the first “fold over” a second time (creating the second hem).

[0014] 6. Press the second “fold over” every six inches in length until an entire double roll folder over is created along the entire length of the fabric in a uniform, straight, and clean manner, (a second “measure-press” step)

[0015] 7. Stitch through both folds securing them together into a “double rolled hem.”

[0016] As will be appreciated by the art, completing steps 1-7 above is a hugely time consuming and difficult-to-conduct task without the requisite hand skill (or mechanical complexity) and involves multiple “measure-press” steps that are difficult to perform.

[0017] Several related art inventions have been created in an attempt to aid or ultimately speed the above-described process flow. The first is a measuring, hemming, and pressing device (U.S. Pat. No. 4,186,489 to Vigilante et al.), the entire contents of which is herein incorporated by reference. This device provides a grid-like assembly of assembly standard and metric measurements imprinted on the working surface of an ironing board cover to facilitate a uniform measurement and pressing process (thereby eliminating the need to hand measure). As can seen from the views provided in the reference itself (incorporated herein) a user places a fabric-to-be pressed proximate a first line and hand-folds-over a first defined hem amount using a grid line as a reference. This first fold-over is hand-ironed and the step is repeated. Accuracy is improved by employing the larger grid rather than a small measuring tape.

[0018] A second related art reference (U.S. Pat. No. 5,732,489 to Udelle et al.) the entire contents of which are incorporated herein by reference, provides a hem measuring gauge for mounting on the front of a hand held electric iron. The guide is a transparent thermoplastic with a series of gauges allowing a user to fold/measure/press in an almost-continuous manner. The guide allows a user to form a first fold over more quickly then earlier known but a user must still employ the device to series to form one or more fold-over or a double rolled hem line.

[0019] Additional complex machinery devices have been invented in an attempt also overcome the complexities noted. Unfortunately, each of these devices requires such extensive operation, expense, and rigidity uniformity of operation condition that the remain unavailable except to commercial shops.

[0020] In Burton (U.S. Pat. No. 3,773,022) a method and apparatus for folding and sewing hems is disclosed in the form of a fully mechanized production sheet with moving tables, mechanical rollers and flipper arms. The contents of this disclosure are fully incorporated herein by reference. This system prevents use by individual consumers for singular home jobs such as sewing a cushion, or larger jobs such as creating curtains or clothing. This system obviously also requires constant maintenance by a team of mechanical repair individuals. Ultimately, the Burton reference is specifically addressed to a high volume manufacturing process ill suited to adaptive consumer use.

[0021] In Ragnebring (U.S. Pat. No. 4,648,336), the entire contents of which are herein incorporated by reference, a hem shaping device is provided to fold the continuous edge of a fabric sheet employing a plurality of rollers and a serpentine moving belt. As noted specifically in FIG. 3 of the disclosure, a fabric edge is gripped by rollers and moving belts and with other moving/pressing rollers and shifted laterally. Unfortunately, this device necessitates the simultaneous lateral movement of both the gripped-edge of the fabric/textile to be hemmed and the corresponding movement of the fabric-field
or non-gripped portion of the fabric/textile, so as to prohibit the fabric bubbling and ultimately tangling.  

[0022] As a consequence of the challenges noted above, what is also not appreciated by the related art, nor those skilled in the art to date, is that a double rolled hem must be made quickly and accurately so as to minimize waste or loss of dimensional accuracy while maintaining all the benefits of true individual hand-craftsmanship adaptable to divergent projects of varying shapes and sizes.  

[0023] Accordingly, there is a need for a double rolled hem ironing device ready for consumer-use application.  

SUMMARY OF THE INVENTION  

[0024] An alternative aspect of the present invention is to provide a hand held device that overcomes the detriments noted above.  

[0025] Another alternative aspect of the present invention is to provide a hand held ironing device allowing a user to create a continuous double rolled seam with reduced effort and a uniform consistency.  

[0026] Another alternative aspect of the present invention provides a consumer-portable device for generating singular or double hems and allowing the use of dual- or single-sided steam application.  

[0027] The present invention relates to a hand held ironing unit including at least a first and a second ironing unit members and a mechanism for grasping and retaining a first and a second material fold over during an ironing or heating step. The hand held design allows users to slide the unit along a continuous unfinished length of material and form a uniform and continuous double rolled hem configuration. Adjustable measurement guides allow for hem accuracy and alternative configurations provide steam application and other options.  

[0028] The present invention also relates to consumer-portable dual hem ironing unit including at least a first and a second ironing unit members and a mechanism for grasping and retaining a first and a second material fold (first and second hems) during an ironing of the folded material. The consumer-portable design allows users to slide the unit along an unfinished length of material and form a uniform continuous double rolled hem configuration. Adjustable measurement guides allow for hem accuracy and alternative configurations provide steam options. An alternative heavier-use embodiment enables securing to a table edge and includes an enhanced water capacity for improved steam generation. Multiple mechanisms are provided for gripping the folded material and include a scissor-type and a vertical-sliding type mechanism.  

[0029] According to another alternative embodiment of the present invention there is provided a double roll hem device for forming first and second cooperative hem roles in an external member during a use, comprising: a first and a second means for releasably gripping respective first and second hem rolls proximate a live edge of the external member during the use, control arm means for selectively engaging the first and second means for releasably gripping respective the hem rolls, the control arm means operating relative to each other about a live hinge locus, and heating means for providing a thermal influence on at least one of the first and second hem rolls during the use, whereby during the use the means for releasably gripping engages respective the hems for heating prior to a release of the formed cooperative hem rolls.  

[0030] According to another optional aspect of the present invention, there is provided a method for forming at least a first and second cooperative hem roll in an external member during a use of a double roll hem device, comprising the steps of: providing a first external member having a live edge for hemming, hand forming a first hem roll portion along a first portion of the live edge, releasably gripping the first hem roll portion in a first means for releasably gripping the hem rolls in the double roll hem device during the use, forming a second hem roll portion along the first hem roll portion, releasably gripping the second hem roll portion in a second means for releasably gripping the hem rolls during the use, applying a thermal influence on at least one of the first and the second hem rolls during the use, releasing the first and second means for releasably gripping the external member, and moving the double roll hem device along the live edge of the external member to a second portion, thereby urging the live edge to roll inwardly to respective the first and second means for releasably gripping enabling a second step of applying a thermal influence.  

[0031] According to another optional aspect of the present invention there is provided a portable hem apparatus, for forming at least first hem roll along a live edge of a flexible material, comprising: a top arm unit assembly operably extending from a support body and opposing the bottom arm unit assembly, live hinge means for enabling the top arm unit assembly to operably approach the bottom arm unit assembly from an open position to a closed position for a pressing engagement of the live edge of the flexible material during a use, a first heating plate assembly on the top arm unit assembly opposing a second heating plate assembly on the bottom arm unit assembly, a hem plate assembly repositionably projecting between the first and second heating plate members, and means for enabling the hem plate assembly to approach the first heating plate member during the use, whereby the at least first hem roll is positionable between a top of the hem plate assembly and the first heating plate member and pressed during the use forming at least a first hem.  

[0032] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: means for enabling a second hem roll between a bottom of the hem plate assembly and the second heating plate assembly on the bottom arm unit assembly, whereby the portable hem apparatus enables simultaneous pressing of the first hem roll and the second hem roll during a second use.  

[0033] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: thermal control means for controlling a use-temperature of the first and second heating plate assemblies, whereby the portable hem apparatus is adaptable to differing temperature requirements of the flexible material.  

[0034] According to another optional aspect of the present invention there is provided a portable hem apparatus, wherein: the thermal control means includes means for independent thermal control of the first and second heating plate assemblies.  

[0035] According to another optional aspect of the present invention there is provided a portable hem apparatus, wherein: the thermal control means further comprises: means for controlling a temperature of the hem plate assembly, whereby the portable hem apparatus is adaptable to alternative temperature needs of the flexible material.  

[0036] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: steam delivery means for providing an operable steam delivery to at least one of the first and the second
opposing heating plate assemblies, whereby the steam delivery means enables at least a steam press of the first hem roll.

[0037] According to another optional aspect of the present invention there is provided a portable hem apparatus, whereby the steam delivery means provides the operable steam delivery to both the first and the second opposing heating plate assemblies.

[0038] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: spring means for urging the hem plate assembly away from the first heating plate of the top arm unit assembly, whereby the spring means enables an enhanced release of the first hem roll following the use.

[0039] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: spring means for urging the hem plate assembly away from the first heating plate of the top arm unit assembly, whereby the spring means enables an enhanced release of the first hem roll following the use.

[0040] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: at least one means for adjusting a first hem roll depth and a second means for adjusting a second hem roll depth during the use, whereby the portable hem apparatus enables a user to readily adjust the first hem roll depth and the second hem roll depth independently from each other.

[0041] According to another optional aspect of the present invention there is provided a portable hem apparatus, wherein: the live hinge means for enabling includes at least one of a scissor handle assembly, a hand support assembly, and a hand press assembly, thereby enabling the portable hem apparatus to readily adapt to alternative constructions.

[0042] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: at least one means for measuring a size of at least one of the first hem roll and a second hem roll, and the at least one means for measuring being on at least one of the top arm unit assembly, the bottom arm unit assembly, and the hem plate assembly, whereby the at least one means for measuring enables a user to determine a measurement of the at least one hem roll.

[0043] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: means for urgingly engaging the repositionable hem plate assembly on the first heating plate member prior to a pressing use of the portable hem apparatus, whereby the means for urgingly engaging the first hem roll to be secured between the repositionable hem plate assembly and the first heating plate member prior to the pressing thereby improving an improved control of the portable hem apparatus.

[0044] According to another optional aspect of the present invention there is provided a portable hem apparatus, wherein: the steam delivery means includes at least one reservoir in the portable hem apparatus.

[0045] According to another optional aspect of the present invention there is provided a portable hem apparatus, further comprising: roll guide means for guiding the live edge of the flexible material into the first hem roll between the first heating plate assembly and the hem plate assembly.

[0046] According to another optional aspect of the present invention there is provided a portable hem apparatus, wherein: the roll guide means for guiding is repositionably securable to a second heating plate assembly on the bottom arm unit assembly, whereby the roll guide means is repositionable to secure a desired hem roll position of the flexible material.

[0047] The above, and other alternative aspects, objects, features and advantages of the present invention will become apparent from the following description read in conjunction with the accompanying drawings, in which like reference numerals designate the same elements.

BRIEF DESCRIPTION OF THE DRAWINGS

[0048] FIG. 1 is a perspective side view of a first embodiment of the consumer-use hemming device.

[0049] FIG. 2 is a partial cut-away view of section 2-2 in FIG. 1.

[0050] FIG. 3 is a partial cut-away view of region 3 in FIG. 1.

[0051] FIG. 4 is a partially cut-away of region 4 in FIG. 1.

[0052] FIG. 4A is an exploded sectional view of the hem plate assembly noting the adjustability features in FIG. 1.

[0053] FIG. 5 is a partially cut-away view of the bottom arm unit of the embodiment in FIG. 1.

[0054] FIG. 5A is an exploded partial view of the laterally adjustable roll guide unit of FIG. 1.

[0055] FIG. 6 is a side view of the first embodiment of FIG. 1 in a first hem positioning step.

[0056] FIG. 6A is a detailed view of FIG. 6 noting a hem plate adjustment motion.

[0057] FIG. 7 is a side view of the first embodiment of FIG. 1 is a second hem positioning and ironing step.

[0058] FIG. 8 is a perspective side view of a second embodiment of a consumer-use hemming device.

[0059] FIG. 9 is a perspective side sectional view along line 9-9 in FIG. 8 of a folded cloth member having a shorter first hem and a longer second hem following an ironing step.

[0060] FIG. 10 is a partial exploded view of the second embodiment from FIG. 9 noting the laterally adjustable roll guide unit of FIG. 9.

[0061] FIG. 11 is a perspective side view of FIG. 10, with the roll guide unit installed noting a guiding positioning on a support surface.

[0062] FIG. 12 is a perspective exploded view of the hem plate assembly and a top arm unit assembly.

[0063] FIG. 13 is a partial sectional side view along line 13-13 of FIG. 8, noting a fabric or first hem positioning location.

[0064] FIG. 14 is a partial sectional view along line 14-14 of FIG. 11, noting fabric in an adjusted hem view and pressing view.

[0065] FIG. 15 is a side perspective view of a third stabilized embodiment of a consumer-use hemming device.

[0066] FIG. 16 is a perspective sectional side view along line 16-16 in FIG. 15 of a folded cloth member having a shorter first hem and a longer second hem following an ironing step.

[0067] FIG. 17 is a perspective exploded view of the third embodiment of FIG. 15.

[0068] FIG. 18 is a side view section along line 18-18 of FIG. 15 of the third embodiment noting fabric in a first hem creating position but removing the volute guide member 308 for clarity.
FIG. 19 is a side view of the third embodiment of FIG. 18 in a dual hemming position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to at least one embodiment of the invention that is illustrated in the accompanying drawing. The same or similar reference numerals are used throughout the drawing and the description to refer to the same or like parts or steps. The drawing is in a simplified form and is not to a precise scale or shape. For purposes of convenience and clarity only, directional terms, such as top, bottom, up, down, over, above, and below may be used with respect to the drawings. These and similar directional terms should not be construed to limit the scope of the invention in any manner. Furthermore, the words “connect,” “couple,” and similar terms with their inflectional morphemes do not necessarily denote direct and immediate connections, but also include connections through mediate elements or devices.

As used herein the phrases woven, non-woven, textile, cloth, sheet goods, film, dress goods, piece goods, flexible members, and clothing will be understood by those of skill in the art to be collectively represented by the example of cloth for the purposes of this discussion. Thus, for example, although the material Mylar® is an artificial sheet good (e.g., flexible member) that may be formed as a non-woven film for the use in such diverse fields as sailing, architectural drawing, and composite engineering; when employed as a sail-type sheet good Mylar® may need to be double roll hemmed and stitched or otherwise bonded in some way to provide a clean and strong field edge. Such an example shall be understood to be within the scope of the present discussion. Similarly, the use of woven reinforced nylon for use in parachutes or other sports-based constructions may need to be double roll hemmed in a convenient manner sided by thermal adjustment (heat) for shrinking or sealing and or a humidity or vapor assist (steam) step that can be combined with a formation step of the double rolled hem or performed separately.

Referring now to FIGS. 1-7, a first double roll or hem consumer-use system assembly 100 is shown with a hand held iron device having a top scissors arm unit assembly 101 and a bottom scissors arm unit assembly 102 operable relative to a live hinge assembly mechanism 103, allowing relative motion there between. A main support body member 104 joins arm unit assemblies 101, 102 via live hinge assembly mechanism 103 and supports a control handle 107 allowing an operative trigger or handle control member 107A to operate relative thereto and thereby control the relative motion of top scissors arm unit assembly 101 as will be apparent to those of skill in the art of mechanical consumer product design. As will be noted herein, bottom scissors arm unit assembly 102 is positioned coplanar with the bottom of main support body 104 and provides therefore a stabilizing platform for user-operation.

Main support body member 104 houses a water supply reservoir 106 and various water and power distribution pathways as will become apparent through study of the depicted assembly 100. Water reservoir 106 includes a cover cap or access cap 106A threadably engaging an entry portal 106B, as shown specifically in FIG. 3. A power supply cord 105 having a wall-access plug provides electrical power to assembly 100. Main support body member 104 further includes a control switch unit 503 for controlling power supply to the heater assemblies, and a moisture or steam control switch unit 504 for adjusting a volume of water supplied to the heater assemblies, as will be discussed. Water feed lines 109, 109 (FIG. 2) supply water from main support body member 104 to the individual heater assemblies in top and bottom arm units 101, 102 according to stem control switch unit 504, while power feed lines 111, 111, similarly provide electrical power to respective heater assemblies in respective top and bottom arm units 101, 102.

Projecting laterally from bottom arm unit 102 is a bottom unit steam plate assembly 114, including a sealed bottom unit reservoir 115 (FIG. 5) receiving a water supply via feed line 109. A plurality of steam channels or steam openings 119 at a top portion of sealed bottom unit reservoir 115 allow a steam access to a top plate 114A having a corresponding plurality of steam openings 119 allowing a steam passage for steam application as will be discussed. A plurality of resistance heating members 120 traverse the top portion of sealed bottom unit reservoir 115 as shown between steam openings 119 and receive a controlled power input via power feed lines 111.

As a consequence of the proposed bottom unit steam plate assembly 114 it will be apparent to those of skill in the consumer product design arts that press assembly 100 can generate a steam release for pressing, although other constructions, positions, and designs may be alternatively and adaptively employed without departing from the scope of the present invention. For example, while resistance heating members 120 are positioned proximate the steam openings 119, as shown, they may be alternatively positioned below reservoir 115 without departing from the spirit and scope of the present invention.

Additionally noted in FIG. 1 and FIG. 5A is an adjustable roll guide assembly 108 having a generally or rolled shape with a wider end and a narrower-curled end for guiding a fabric member or cloth 500 for hemming along a live edge (the to-be-hemmed edge or to be finished edge). As noted in FIG. 5A, cloth member 500 has a first rolled hem portion 501 and a second rolled hem portion 502 (in a double rolled pre-hem position) shown in the pre-inserted position, and can be slid a direction S inter roll guide assembly 108. Along the narrower-curled end of roll guide assembly 108 is snap and position adjustment member 121, also referred to herein as a guide adjustment finger or member. A corresponding plurality of adjustment receiving snap-fit channels 122 are positioned proximate a bottom portion of bottom unit steam plate assembly 114 and allow a user to securely and removably position, and reposition, roll guide assembly 108 along a depth direction D or a lateral direction relative to bottom arm 102 and assembly 114, as shown in FIG. 5A to control a depth or size of at least second hem portion 502, as will be discussed. In this manner, roll guide assembly 108 allows a user to position respectively cloth 500, and first and second rolled hem portions 501, 502 relative to bottom unit steam plate assembly 114 for hem adjustment as a hem adjustment mechanism. As will also be readily apparent to those of skill in the art, roll guide assembly 108 may be provided in differing shapes, dimensions, roll-volutes, curves, lengths, etc. without departing from the spirit and scope of the present invention. Additionally, while the combination of guide adjustment formations 121, 122 may be readily substituted for other formations understood by those of skill in the consumer product arts, the features of secure adjustment and repositioning-adjustment will not depart from the spirit and scope of the present invention.
As noted best in FIG. 4, a hem plate assembly 110 is urgently suspended from a top unit steam plate assembly 112 extending from top scissor arm unit assembly 101. As a consequence, it will be apparent, that hem plate assembly 110 includes a feature for traveling to contact a top steam plate member 112A of top unit steam plate assembly 112 during a consumer use. A top unit assembly water reservoir 113 is provided within a plastic shell housing and is fed with water via a water feed line 109 as noted above. Top steam plate member 112A of top unit steam plate assembly 112 includes additionally resistant heater elements fed with electrical power via electrical lines 111 and consequently will become sufficient hot to generate steam via steam openings 119A into steam channels 119 and thereby project a steam exhaust downwardly onto a cloth 500 having hems 501, 502, as will be shown.

As can be additionally appreciated (see FIG. 4A), hem plate assembly 110 is suspended via posts 117C held by nuts 117A onto the outer shell housing (as shown), and an urging coil member 117B is suspended there between allowing motion of post 117C through an opening 117D, relative to an urging of spring or coil member 117B all collectively functioning as a means for hemming or compression during a consumer use. As will be additionally appreciated, projecting from and secured relatively to the bottom of posts 117C is hem plate steam plate member 116 and the hem steam plate top member 116A itself. As will be discussed steam plate top member 116A additionally includes a hem stop member 118C for preventing a passage of a rolled hem member 501 outside the scope of hem plate assembly 110. Projecting from a bottom of post 117C, and fixed relative to a spring finger assembly for hem plate depth adjustment 118, is a projecting spring finger assembly 118A that is slidingly positionably and repositionably within a receiving spring finger channel 118B allowing a motion of hem steam plate bottom member 116B relative to hem steam plate assembly 116A and hem stop member 118C, at relative spacing positions marked by detents and projections respectively 600A, 600B along a direction M (FIG. 4) for enhanced user convenience. In this way, hem plate assembly 110 allows a relative vertical motion (for compression during use) and relative lateral adjustment motion (between uses), allowing users control a depth of a first hem member 501 from, for example 1/4" deep to approximately 1/4" deep, as will be later discussed. Similarly, the positioning of hem plate assembly 110 while also controlling roller guide 108 will, in combination allow users to control a depth of a second hem member 502, for example from 1/4" deep to approximately 1/4" deep, as will be later discuss. Consequently, it is proposed that those of skill in the art will readily recognize the adaptability of the present consumer hand press assembly 100 to incorporate a wide variety of uniform and adjustable hem distances, from approximately a small size of 1/4" to more than 1" depending upon user configurations.

Referring now to FIG. 6 in a pre-position assembly fabric member or cloth member 500 is positioned, either by hand rolling or via roll guide 108, into a first hem position and second hem position loosely with jaw 101, 102 in an open or pre-use condition. In FIG. 6A, a user laterally slides hem plate assembly, and hem plate depth adjustment assembly 116, 118 laterally along direction M, with first hem 501 snugly on hem guide 118C serving as a depth stop. As top plate hem member 116A slides relative to bottom hem plate member 116B, the relative depth of first hem 501 and second hem 502 may be adjusted by snugly adjusting either unit 100 itself or by pulling fabric 500 outwardly in direction T so as to remove overlaps and the formation of a continuous double rolled hem assembly along a live edge of a cloth or fabric member 500. Thereafter, in FIG. 7, trigger handle 107A is engaged, and top and bottom arm assemblies 101, 102 engage, providing a dual sided steaming of the double rolled hem. Since hem plate assembly 110 also includes a plurality of steam holes or channels 119, steam is readily passed completely through the entire double rolled hem.

During continuous use, a user may readily move unit 100 relative to the top edge of cloth 500, preferably with one hand, while employing their second hand to retain the live now-formed double rolled hem, such that the roll guide 108 (already engaging and rolling the double hem roll) continuously feeds unit 100 during the user-motion along the live edge of cloth 500. As a consequence of this beneficial design, those of skill in the art will readily recognize that a single user may readily employ unit 100 to continuously form a double rolled hem along a live-edge length of cloth, textile, or other material without the previously recognized and laborious step-wise hand-measuring, pinning, and hand-ironing each hem individually.

Referring now to FIGS. 8 through 14, a second alternative consumer-use double roll hem iron unit 200 is shown. In the present alternative embodiment, steam is provided or generated only on one side of fabric or sheet member 500, as will be discussed. Additional alternative constructions for portions of the present invention will be illustrated without departing from the spirit and scope of the present invention.

As will be recognized by those of skill in the art who study of the entire disclosure herein, hand press unit 200 includes a top arm unit 201 and a bottom arm unit 202 pivotally engaged by a live spring member assembly 203, allowing pivoting engagement relative thereto so as to bring top arm unit 201 (functioning here as a steam delivery arm) into contact with the double rolled first and second hems respectively 501, 502 or sheet or cloth member 500 (See FIG. 9) to form respective press portions P1 and P2 (FIG. 9) as determined by an end user using the techniques herein. Power supply delivery 205 is provided to unit 200. A support body assembly 204 includes a platform for a hand support 207 allowing a user to press downward along direction P (FIG. 8) so as to cause a relative pivoting motion P1 (FIG. 14) and press the double rolled hem assembly.

Bottom arm unit 202 includes a bottom unit heating plate 214, which may also include a plurality of holes or merely a hot or steam-hot surface for heat pressing the hems relative thereto. Control switch 503 (FIG. 11) controls power delivery via respective wires 211 to top and bottom arm assemblies 201, 202. Water entry portal 206A supplies water to an interior water chamber 213B accessible by the water entry pipe member 206B who’s water delivery rate is controlled by steam pressure switch member 504. As will be recognized by those of skill in the art a plurality of steam or water delivery systems may be provided in the present unit without departing from the spirit and scope of the present invention. Top arm assembly shell 213 is secured to top arm unit 201 and contains the water reservoir and heating plate unit assembly 212 as disclosed best in FIG. 12.

An or volute or folded edge dual roll guide 208 is repositionably attachable to a side of bottom arm unit assembly 202 via a plurality of sliding and snap engagement openings 222, and respective snap members 221A. It will be rec-
ognized that engagement openings 222 are slotted engagement openings allowing dual roll guide 208 to be repositionably attached along direction S2 (FIG. 10) to allow for differing adjustment distances for hems 501, 502, as will be discussed.

[0085] A hem plate assembly 210 includes a spring adjustable hem plate member 216 having a plurality of steam passage hole members 219 for allowing steam from steam holes 219 in top unit steam plate 212 to reach entirely through the double rolled hem and so securely press both hems 501 and 502. Spring adjustable hem plate member 216 also includes a hem plate adjustment assembly 218, including a spring finger channel 218A for slidingly receiving bottom sliding tabs (shown FIG. 12 but not numbered) projecting from a bottom of hem end plate rail 218C. As will be readily apparent to those of skill in constructing consumer electronic devices, a projecting member projects outwardly from top arm unit assembly 201, away from top unit shell 213, and receives, via a plurality of openings, a plurality of post members 217C received in the projecting member and elastically urged by the spring force of spring members 217H, and stopped by respective stop members 217A at top portions thereof. At bottom portions of posts 217C hem plate member 216 is secured by nuts 217I, allowing vertical motion V (FIG. 14) during a pressing operation.

[0087] As will be appreciated by those of skill in the art, since hem plate member 216 is secured to the bottom of posts 217C, during pressing operations (FIG. 12), posts 217C move relative to top shell member 213, and allow a pressing of the double hems between top and bottom arm units 201, 202.

[0088] While it is not shown in the figures, those of skill in the art will recognize that heating wire elements or power feed lines 211 may be readily directed to bottom unit heating plate 214 without departing from the spirit and scope of the present invention, for example by routing feed lines 211 via live hinge 203 to bottom arm unit 202.

[0089] In FIG. 13, specifically, a user, spring or hem plate depth adjustment system 218, and bar 218C is employed to position first hem 501 as desired by a user below top arm steam and heating plate 212. Thereafter, via rolled edge guide 208 adjustment second hem or roll 502 is positioned and fabric 500 is tensioned outwardly, away from live hinge 203 thereby smudging the second roll or second hem 502 proximate the back or rear edge of the hem plate 216 of hem plate assembly 210, without departing from the scope and spirit of the present invention.

[0090] Consequently, as seen in FIG. 14, a double rolled hem is created, and may be pressed with both heat (via top and bottom unit heating plates 212, 14, and top unit steam delivery via top unit reservoir 213B).

[0091] In contrast with the initial embodiment noted prior to FIG. 9, the present second embodiment provides an alternative construction that appeals consumers requiring different, but related, functions. For example the present embodiment (assembly or press) provides steam input from only the topside, but has two opposing heated plates. Consequently, while each of the proposed embodiments herein is readily adapted to a plurality of cloths or sheets 500 for double rolled hemming, some cloths or sheets 500 may be more readily adaptable to the top-steam-only embodiment in FIGS. 8-14. Additionally, since the first principal embodiment employed a scissors-type action it required a user with hand-grip strength, which over time, may result in user fatigue. In contrast to the first embodiment, this second embodiment merely relies upon a downward pressure via pressing grip assembly or press assembly 207, allowing a simple vertical pressing move to translate into the pivot motion of the arms relative to live hinge assembly 203. As a result, a proposed benefit of the present second embodiment, is that long-term user fatigue is minimized. As an additional benefit of the present second embodiment, the heavier construction provides a less portable (but more stable) assembly, and the larger water reservoir allows for enhanced or extended continuous use. Overall, the first embodiment is preferably directed to shorter-term uses requiring greater dexterity or even non-support-cloth use. The second embodiment, in contrast, is preferably supported on a support surface where a user may employ their body weight to increase a pressing-pressure.

[0092] Referring now to FIGS. 15 through 19, a third embodiment of a hand pressing assembly or double rolled hem device 300 is provided. Assembly 300 includes a top and a bottom arm unit assembly, respectively 301, 302, and provides alternative advantages then those possessed by the earlier two discussed embodiments. For example, assembly 300 includes an optional hold down unit 600 having an edge clamp member 601 for gripping the edge of a support surface, and an adjustable positioning assembly containing a pair of adjustment slots 602, 602, and corresponding fixing knobs 603, 603 threadably engaging support body 304, as shown. Those of skill in the art will appreciate that alternative hold down unit constructions may be provided without departing from the spirit and scope of the present invention, for example, a magnetic member may be employed below support body 304 for use with a magnetic or paramagnetic support surface in a magnetic clamping action.

[0093] Bottom arm unit assembly 302 includes a bottom thermal plate member 314 that is electrically powered via a power supply cord 305 via control power switch 503 and internal electrical connections recognizable by those of skill in the consumer product arts.

[0094] A rearwardly projecting support assembly 303, 303 on each respective top and bottom unit assemblies 301, 302 provide top and bottom projecting posts 303B or post receiving openings, as shown. Posts 303B are bound by respective springs 303A and respective retaining caps 303C, as shown that allow a vertical motion via force F allowing top arm unit assembly 301 to approach bottom arm unit assembly 302 during a use, as will be discussed. Additionally, it is noted that a sliding slot assembly 340 including a plurality of sliding finger members 340A projects rearwardly from a portion of top arm unit assembly 301 and slidingly engages sliding slots 3403 in support body 304. Since top arm unit assembly 301 is laterally restricted relative to bottom arm unit assembly 301, but allows steady spring-biased upward pressure, hand press assembly 300 is suitable for single-user pressing uses.

[0095] Projecting from a front of top arm unit assembly 301 is a hem plate assembly 310 including a spring plate assembly 117 having a plurality of spring posts 317C, bound by a plurality of springs 317B, and engaging and retaining nuts 317A within an extending bracket member projecting from top reservoir container 306, and ultimately supporting sliding hem plate steam plate member 316 in a manner noted and discussed above.

[0096] A handle or hand support assembly 307A (FIG. 18), allows a user to apply a force lb downwardly resisted by spring hinge assembly 303 containing respective brackets, posts, springs, and caps. Water entry member 306A allows
users to add water to the extensive interior reservoir 313 while steam and thermal switch 504 allows a steam delivery and temperature control of both top steam plate 312 and bottom thermal plate 314. A plurality of steam openings 319 is proposed in both top steam plate 312 and in the hem plate assembly 310, for use in a manner earlier discussed.

Here, it will be understood, that hand held press assembly 300 is provided with a hem plate depth adjustment assembly similar to that in either the second embodiment or first embodiment without departing from the scope and spirit of the present invention.

Similarly to the earlier embodiments, a volute guide shape member 308 is provided on a right side of press assembly 300, and may optionally adjust either of the previously disclosed lateral motion and securing constructions allowing a user to readily position second hem roll 502 relative to bottom plate 314 and to feed hem plate depth adjustment assembly 318 having hem plate 316, in a manner similar to that discussed earlier.

In each of the above embodiments, those of skill in the art will recognize that following an overall first press operation, device assemblies 100, 200, 300 repositioned along the five length of the cloth member (either by sliding the assembly (as in assembly 100), or by sliding the fabric (as in assembly 300) fixed to the support table). Thus, after repositioning a second press operation is conducted, and so forth. It will be recognized, that in either type of repositioning (moving unit or fabric), the user’s free hand or a helper’s hands are employed to prohibit unintended wrinkling in either the double rolled hem or the fabric field itself.

It will be additionally recognized by those of skill in the sewing and consumer product design arts, that during the initial setup, the user hand rolls the first hem member portion 501 and feeds the same in to respective roll guides 108, 208, 308, or operates with out them. Thus, it will be understood, that the to-be-hemmed edge of the field will be in differing rolled/unrolled stages; including an initial unrolled or semi-rolled edge prior to the influence of roll-tension, a partially rolled edge transition at an intermediate application of roll-tension, and a fully double rolled edge portion upon engagement within the devices, as can be readily understood from the principal images and discussion of this application.

In an operational understanding of the present systems 100, 200, and 300, an electrical supply member respectively 105, 205, and 305 is provided, shown here as an electrical line suitable for connection to a conventional power source. While not the principal focus of the present disclosure, those of skill in the art will recognize that electrical supply 105, 205, and 305 may be replaced with a stored charge device such as a battery without departing from the scope and spirit of the present invention.

As can be appreciated from the figures, first and second gripping arms or gripping means extend distally (away from) from live hinges 103, 203, and 303, respectively. Similarly, it will be recognized that top arm unit assemblies 101, 201, and 301 include the hem plate spring assemblies hem plate assemblies as a form of first clamping system for clamping the first roll hem. Opening together, top and bottom arms both include a form of second clamping system for clamping the second roll hem between heating.

During the creation of either single or double roll-over hems it is well known that constant physical measuring is required to ensure a consistent hem. While not depicted in each embodiment, measurement gauges or measurement demarcations 700 (FIG. 5A in the roll guide 108) or measurement gauge points 701 (FIG. 4A) in slit on hem support plate 116. As shown, adjustment guides are either thermally resistant printing, or plastic forming marks that may be employed by users when positioning first and second roll hems 501, 502 relative to respective pressing/ironing locations. As a consequence, those of skill in the art of consumer product design will readily appreciate that measurement guides may be readily changed or repositioned without departing from the spirit and scope of the present invention. As a consequence, the present invention supports and provides both initial measurement systems, but also the capacity for in situ (in process) measurement of a hem depth while forming a double or single rolled hem.

While not visually described in FIG. 1, those of skill in the art should recognize that respective measurement gauges 700, 701 may be constructed to be adjustable in various manners along respective plates. For example, measurement gauges may be printed on the surface allowing for visual adjustment, or they may be physically adjustable in a sliding fashion employing a slot/groove configuration (not shown). The measurement gauges may also be fixable in place following adjustment by use of a cam-lock or thread-locking screw, or in any other suitable manner known to those of skill in the art of consumer product design having measurement gauges. For example, a measurement guide line may be provided on any one of the top and bottom heater/steam plates, or the suspended hem plate itself, merely by etching or cutting the surface in some critical matter.

Also while the present disclosure provides alternative means for snap-fit removal and adjustment of the respective roll guides, noting herein shall be interpreted to require the actual use of respective roll guides. The roll guides are provided for user convenience, to aid fabric positioning, and are not mandatory to any use, or any preferred use.

As noted above, as a consequence of the present alternative constructions, those of skill in the art of product design will readily appreciate the supportive benefits provided by edge guide members and respective adjustable hem plate assemblies when forming a double rolled hem on particularly long or heavy-weight materials.

Another aspect of the present invention that should be appreciated by those of skill in the art is the capacity for a user to control both (a) the use of steam projection and (b) the use of thermal influence or heating, on an individualized arm-by-arm basis respective of top and bottom arms. It is also envisioned, that as necessary, an alternative construction may provide a heated hem plate member via electrical resistance elements to additionally support dual rolled hem constructions (in this circumstance, a there would be three heated surfaces for pressing particularly resistance sheet goods. It is also additionally recognized, that the present device may be employed for edge sealing as well and may be employed with a sealing tape that creates an adhesive welding bond under thermal influence.

Regarding selective thermal influence or heating, it is envisioned therefore, that an electronic control mechanism (not shown) may be positioned within the handle or body regions for enabling a user to selectively choose to supply current to electrically resistive heating elements positioned in respective arm members. It is further envisioned that devices 100, 200, and 300 and the associated electronic control mechanisms (not shown) will also include means for selecting a temperature setting for selectively chosen heating mem-
bers (for example “setting numbers” 8, 9, and 11, etc.), allowing a user, for example to heat top arm members to a different or differing temperature then bottom arm unit assemblies.

[0109] As a consequence, those of skill in the consumer products fields should readily recognize that the present inventions includes the means for selecting not only alternative heating zones and alternative heating members, but also the ability to select a temperature setting for each respective heating member, for example in temperature ranges from room temperature to as high as 220° F. for super-hot steam pressing. As a consequence those of skill in the art of fabric design will readily understand that this device may be useful in a variety of ways from fabric types (cotton, silks, twills, etc.) to use in thermal forming a seam between two single-sided-resin impregnated sail cloth sheet goods.

[0110] Regarding steam projection into fabric or cloth member 500, it is envisioned therefore that the present inventions include adaptive use of one or more fluid reservoirs for storing steam-producing water, but also a delivery system and functional control system for delivering water to respective heating members and a control system (not shown) for enabling a steam-volume control and a heating-member control for each steam. As a consequence, it should be recognized by those of skill in the art that a user may operate a steam control system (not shown) for selectively providing both a volume of steam and a selected location of such steam volume among selectable heating members. As an example of the present embodiment, it should be appreciated by those of skill in the art that, for example, employing the means and mechanisms described above, that heating members 120 in a bottom arm unit assembly may be heated to 140° F. without steam, while a heating member 120 may be left at room temperature in a center of top arm unit assembly and side heating members 120 in the same top arm unit assembly may be heated to 212° F. and provided with a water flow to produce steam. As a consequence of this discussion it should be readily recognized that the heating systems discussed herein may be readily adapted for a wide variety of heat and moisture sensitive materials requiring at least a single rolled hem.

[0111] It an alternative aspect of selective engaging mechanisms noted above, it is envisioned that a cam-engagement lock (not shown) or other physical latch (not shown) may allow a user to pre-clamp hem plate assembly 110 in a plane-parallel motion relative to the base line 8 of the arm unit assembly to secure first fold 501 while leaving second fold over 502 loose for later adjustment and clamping. As a consequence, a temporary clamping mechanism is readily provided.

[0112] Those of skill in the art of consumer products will readily recognize that while the present disclosure discusses alternative hinge mechanisms, from a simple scissors action, to a second degree hinge receiving a single pressure point, to a sliding assembly, in each circumstance first and second arm units are movable relative to each other so as to drive together to form first or second hems. In each circumstance, therefore, those of skill in the art will recognize these types of assemblies as being “live hinges” or “live hinge assemblies” without departing from the scope and spirit of the present invention.

[0113] Those of skill in the art will recognize that the use of the phrase volute as employed herein shall be interpreted broadly to equally apply to each of the roll guides discussed herein, despite their differing appearance, curved shapes, and construction and positioning details. The phrase volute is used very broadly to refer generally to a spiral or twisted formation or object that may be used to guide the live edge of a cloth or flexible member 500, and may therefore have both flat and curved regions, and may have decreasing radius spirals or curves, all without departing from the scope and spirit of the present invention.

[0114] In the claims, means- or step-plus-function clauses are intended to cover more structures described or suggested herein as performing the recited function and not only structural equivalents but also equivalent structures. Thus, for example, although a nail, a screw, and a bolt may not be structural equivalents in that a nail relies on friction between a wooden part and a cylindrical surface, a screw’s helical surface positively engages the wooden part, and a bolt’s head and nut compress opposite sides of a wooden part, in the environment of fastening wooden parts, a nail, a screw, and a bolt may be readily understood by those skilled in the art as equivalent structures.

[0115] Having described at least one of the preferred embodiments of the present invention with reference to the accompanying drawings, it is to be understood that die invention is not limited to those precise embodiments, and that various changes, modifications, and adaptations may be effected therein by one skilled in the art without departing from the scope or spirit of the invention as defined in the appended claims.

What is claimed is:

1. A portable hem apparatus, for forming at least first hem roll along a live edge of a flexible material, comprising: a top arm unit assembly operably extending from a support body and opposing said bottom arm unit assembly; live hinge means for enabling said top arm unit assembly to operably approach said bottom arm unit assembly from an open position to a closed position for a pressing engagement of said live edge of said flexible material during a use; a first heating plate assembly on said top arm unit assembly opposing a second heating plate assembly on said bottom arm unit assembly; a hem plate assembly repositioning between said first and second heating plate members, and means for enabling said hem plate assembly to approach said first heating plate member during said use, whereby said at least first hem roll is positionable between a top of said hem plate assembly and said first heating plate member and pressed during said use forming at least a first hem.

2. A portable hem apparatus, according to claim 1, further comprising: means for enabling a second hem roll between a bottom of said hem plate assembly and said second heating plate assembly on said bottom arm unit assembly, whereby said portable hem apparatus enables simultaneous pressing of said first hem roll and said second hem roll.

3. A portable hem apparatus, according to claim 2, further comprising: thermal control means for controlling a use-temperature of said first and second heating plate assemblies, whereby said portable hem apparatus is adaptable to differing temperature requirements of said flexible material.

4. A portable hem apparatus, according to claim 3, wherein:
said thermal control means includes means for independent thermal control of said first and second heating plate assemblies.
5. A portable hem apparatus, according to claim 4, wherein:

said thermal control means further comprises means for controlling a temperature of said hem plate assembly, whereby said portable hem apparatus is adaptable to alternative temperature needs of said flexible material.

6. A portable hem apparatus, according to claim 1, further comprising:

steam delivery means for providing an operable steam delivery to at least one of said first and said second opposing heating plate assemblies, whereby said steam delivery means enables at least a steam press of said first hem roll.

7. A portable hem apparatus, according to claim 6, whereby:

said steam delivery means provides said operable steam delivery to both said first and said second opposing heating plate assemblies.

8. A portable hem apparatus, according to claim 1, further comprising:

spring means for urging said hem plate assembly away from said first heating plate of said top arm unit assembly, whereby said spring means enables an enhanced release of said first hem roll following said use.

9. A portable hem apparatus, according to claim 1, further comprising:

hem plate means for adjusting a first hem roll depth of said hem plate assembly during said use, whereby said hem plate means for adjusting enables a user to adjust a size of said first hem roll depth during said use.

10. A portable hem apparatus, according to claim 1, further comprising:

at least one means for adjusting a first hem roll depth and a second means for adjusting a second hem roll depth during said use, whereby said portable hem apparatus enables a user to readily adjust said first hem roll depth and said second hem roll depth independently from each other.

11. A portable hem apparatus, according to claim 1, wherein:

said live hinge means for enabling includes at least one of a scissor handle assembly, a hand support assembly, and a hand press assembly, thereby enabling said portable hem apparatus to readily adapt to alternative constructions.

12. A portable hem apparatus, according to claim 1, further comprising:

at least one means for measuring a size of at least one of said first hem roll and a second hem roll; and said at least one means for measuring being on at least one of said top arm unit assembly, said bottom arm unit assembly, and said hem plate assembly, whereby said at least one means for measuring enables a user to determine a measurement of said at least one hem roll.

13. A portable hem apparatus, according to claim 1, further comprising:

means for urgingly engaging said repositionable hem plate assembly on said first heating plate member prior to a pressing use of said portable hem apparatus; whereby said means for urging enabling said first hem roll to be secured, between said repositionable hem plate assembly and said first heating plate member prior to said pressing thereby improving an improved control of said portable hem apparatus.

14. A portable hem apparatus, according to claim 6, wherein:

said steam delivery means includes at least one reservoir in said portable hem apparatus.

15. A portable hem apparatus, according to claim 14, further comprising:

roll guide means for guiding said live edge of said flexible material into said first hem roll between said first heating plate assembly and said hem plate assembly.

16. A portable hem apparatus, according to claim 15, wherein:

said roll guide means for guiding is repositionably securable to a second heating plate assembly on said bottom arm unit assembly, whereby said roll guide means is repositionable to secure a desired hem roll position of said flexible material.

17. A system for creating a first and second hem in an external flexible member having a live edge for hemming during a use, comprising:

a first and a second means for releasably gripping respective first and second hem rolls proximate a live edge of said external member during said use;

control arm means for selectively engaging said first and second means for releasably gripping respective said hem rolls;

said control arm means operating relative to each other about a live hinge assembly; and

heating means for providing a thermal influence on at least one of said first and second hem rolls during said use, whereby during said use said means for releasably gripping engages respective said hems for heating prior to a release of said formed cooperative hem rolls.

18. A method for forming at least a first and second cooperative hem roll in an external member during a use, comprising the steps of:

providing a first external member having a live edge for hemming;

providing a double roll hem device;

hand forming a first hem roll portion along a first portion of said live edge;

releasably gripping said first hem roll portion in a first means for releasably gripping said hem rolls in said double roll hem device during said use;

forming a second hem roll portion along said first hem roll portion;

releasably gripping said second hem roll portion in a second means for releasably gripping said hem rolls during said use;

applying a thermal influence on at least one of said first and said second hem rolls during said use;

releasing said first and second means for releasably gripping said external member; and

moving said double roll hem device along said live edge of said external member to a second portion, thereby urging said live edge to roll inwardly to respective said first and second means for releasably gripping enabling a second step of applying a thermal influence.

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