US 20020162865A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2002/0162865 A1

Beletsky et al. (43) Pub. Date: Nov. 7, 2002

# (54) HOLSTER, DUTY BELTS AND ACCESSORY CASES OF LEATHER APPEARING MULTI-LAMINATE AND PROCESS FOR PRODUCING THE SAME

(76) Inventors: **Robert J. Beletsky**, Fallbrook, CA (US); **Karl Kendrick**, San Diego, CA (US); **Anthony G. Lefeber**, Temecula, CA (US)

Correspondence Address:
**John E. Wagner, Esq.**
**LAW OFFICES OF JOHN E. WAGNER**
**3541 Ocean View Boulevard**
**Glendale, CA 91208 (US)**

(21) Appl. No.: **10/136,262**

(22) Filed: **Apr. 30, 2002**

**Related U.S. Application Data**

(60) Provisional application No. 60/288,555, filed on May 2, 2001.

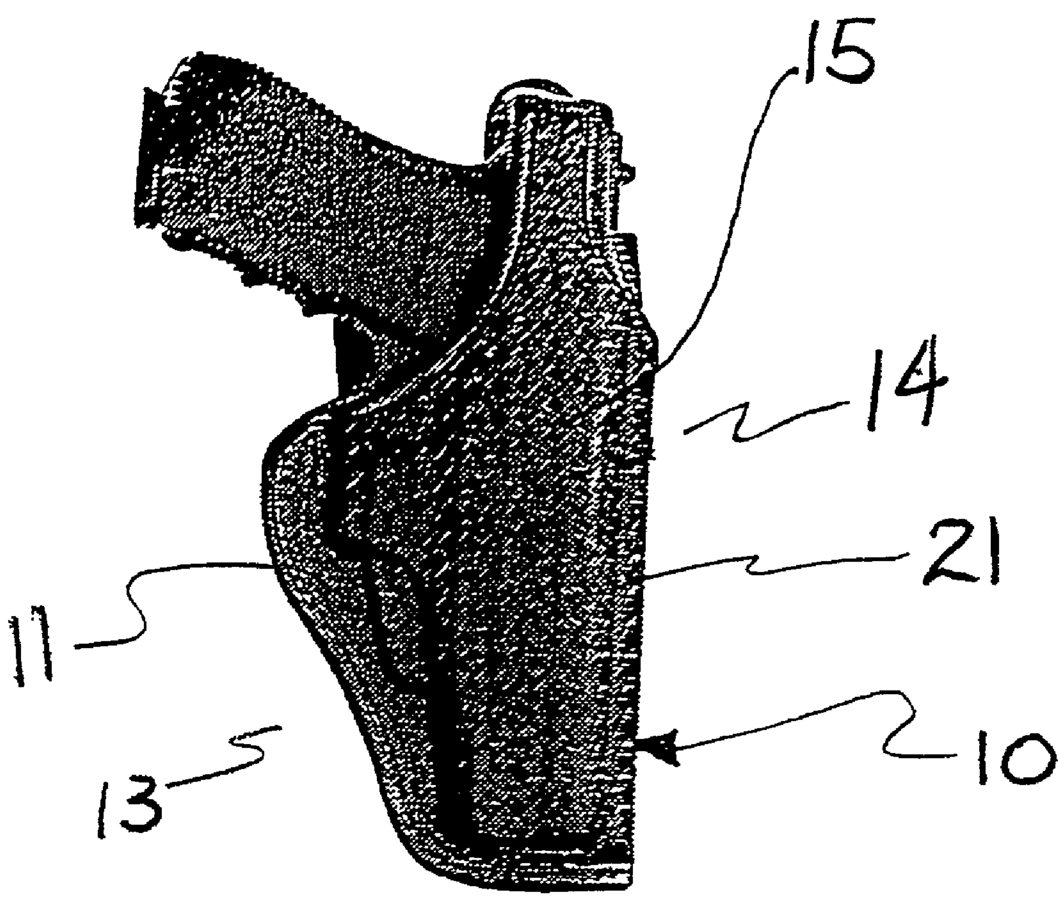
**Publication Classification**

(51) **Int. Cl.**$^{7}$ .................................................... **F41C 33/00**

(52) **U.S. Cl.** ........................................... **224/193**; 224/912

(57) **ABSTRACT**

An article carrier and process for making same made from a laminate material which is lightweight, durable, easy to clean, and easy to maintain. The article carrier has crisp, well-defined edges and contours with an outward appearance almost identical to hand-tooled leather. The process for making the article carrier comprises selecting the laminate, heating the laminate, configuring the laminate in a mold such that the laminate's plane of greatest direction stretch is parallel to the area of maximum deformation of the mold, compressing the laminate to define the article carrier, cooling, trimming the compressed laminate, adding component parts, and joining the compressed laminate together to complete the article carrier.



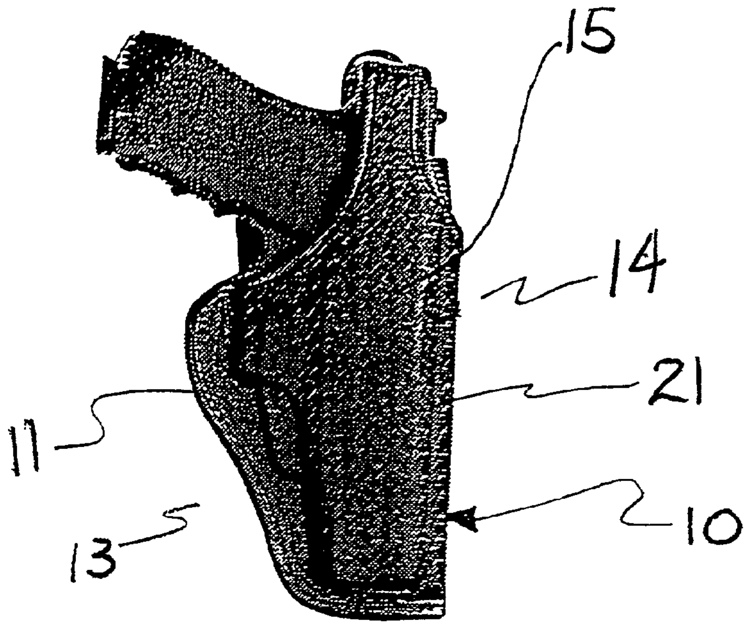



Fig 1

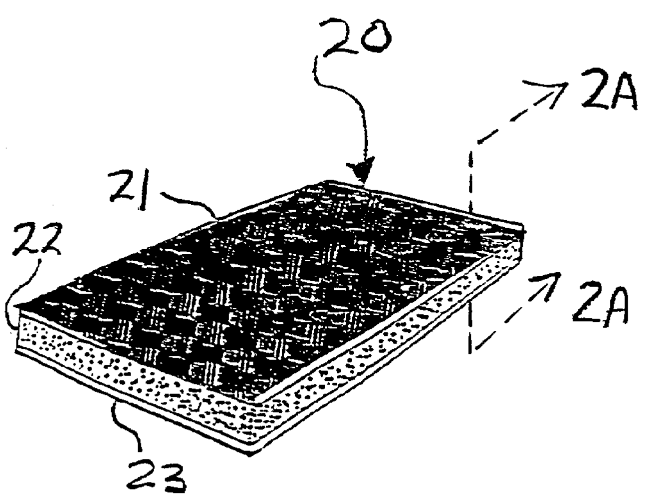



FIG. 2

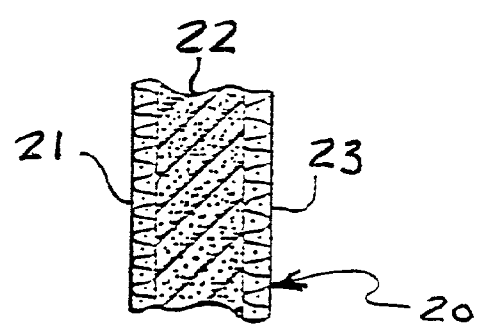



FIG. 2A

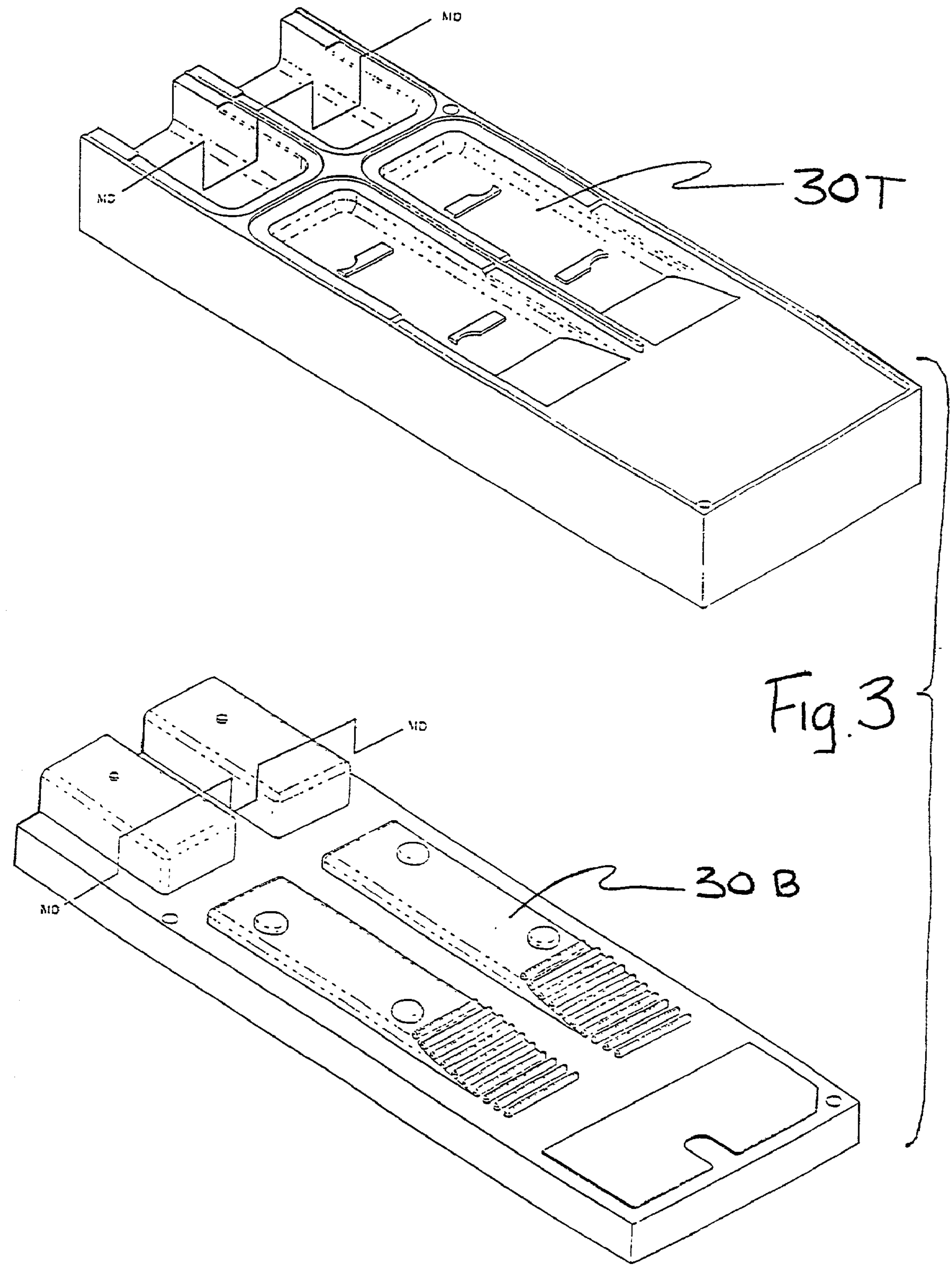



Fig.3

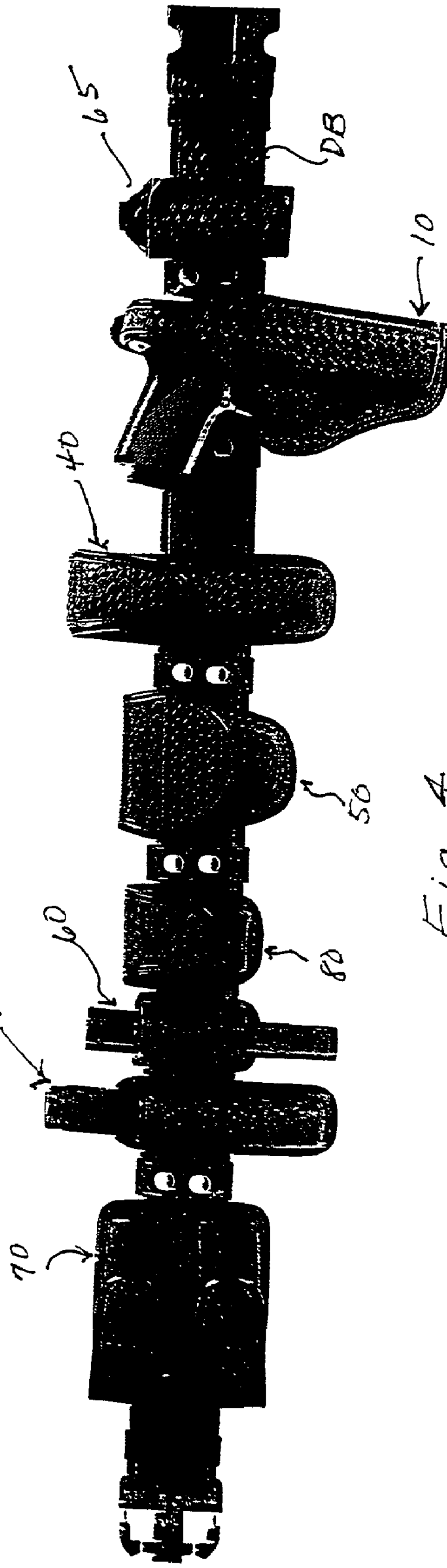



Fig. 4

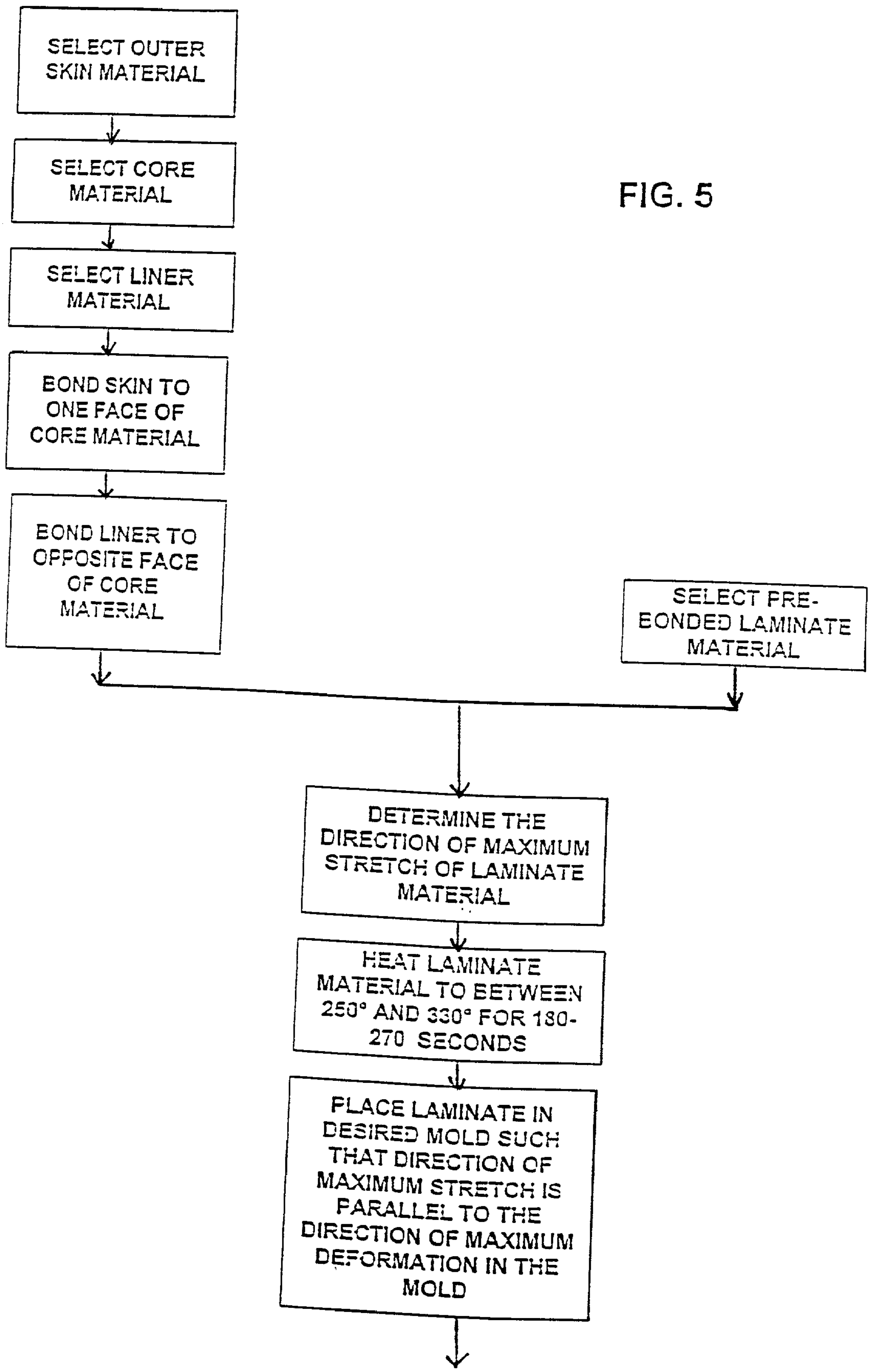

SELECT OUTER SKIN MATERIAL
SELECT CORE MATERIAL
SELECT LINER MATERIAL
BOND SKIN TO ONE FACE OF CORE MATERIAL
BOND LINER TO OPPOSITE FACE OF CORE MATERIAL
SELECT PRE-BONDED LAMINATE MATERIAL
DETERMINE THE DIRECTION OF MAXIMUM STRETCH OF LAMINATE MATERIAL
HEAT LAMINATE MATERIAL TO BETWEEN 250° AND 330° FOR 180-270 SECONDS
PLACE LAMINATE IN DESIRED MOLD SUCH THAT DIRECTION OF MAXIMUM STRETCH IS PARALLEL TO THE DIRECTION OF MAXIMUM DEFORMATION IN THE MOLD

FIG. 5

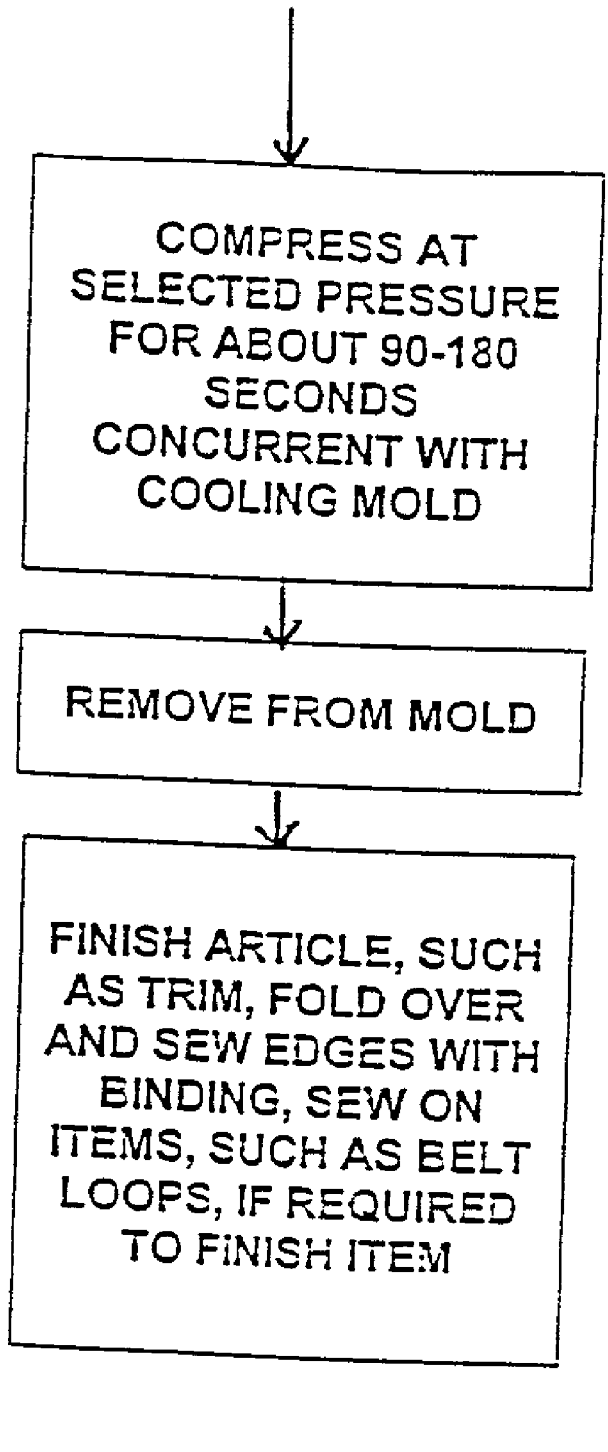



FIG. 5 (Continued)

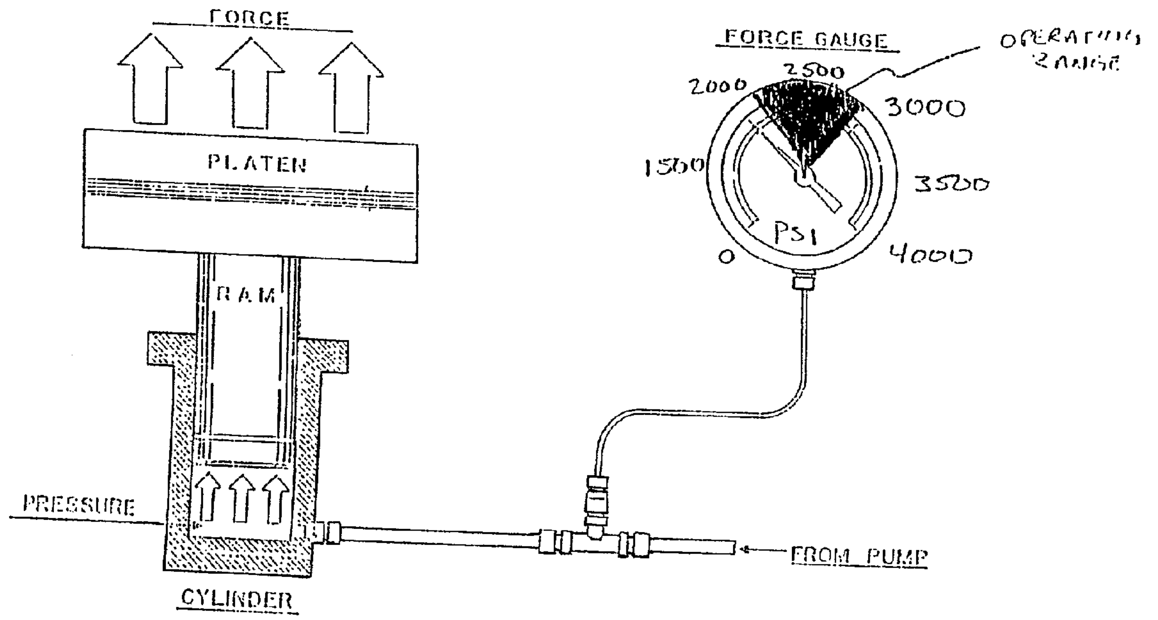

FORCE
PLATEN
RAM
PRESSURE
CYLINDER
FORCE GAUGE
OPERATING RANGE
2000
2500
3000
1500
3500
0
4000
PSI
FROM PUMP

FIG. 6

## TABLE FOR FIG. 6

Force (Lb.) = Ram Area (Sq. In.) x Pressure (Lb./Sq.In.)

$$\text{Force (Tons)} = \frac{\text{Force (Lb.)}}{\text{2000 (Lb./Ton)}}$$

- Most P.H.I gauges are calibrated in pounds or tons output force. The gauge reading is the total force exerted against the work.
- Material pressure can be calculated as follows:

$$\text{Material Pressure (Lb./Sq. In.)} = \frac{\text{Force (Lb.)}}{\text{Area of material (Sq. In.)}}$$

$$\text{Material Pressure (Lb./Sq. In.)} = \frac{\text{Force (tons) x 2000 (Lb./Ton)}}{\text{Area of Material (Sq. In.)}}$$

$$\text{Ram Area} = \pi\,(\text{Radius Ram})^2 \ \text{X}\ 2\ (\text{Rams})$$

$$= \pi\,(3.625)^2\ \text{In}^2\ \text{X}\ 2$$

$$= 82.57\ \text{In}^2$$

$$\text{Force on Platen} = (\text{Ram Area})\ \text{In}^2\ \text{X}\ \text{Pressure psi}$$

$$= 82.57\ \text{In}^2\ \text{X}\ 2500\ \text{psi}$$

$$= 206425\ \text{psi Operating Pressure}$$

$$\text{Material Pressure} = \frac{\text{Force on Platen}}{\text{Area of Material}}$$

$$= \frac{206425\ \text{psi}}{70\ \text{In}^2}$$

70 Sq. Inches = Example Mold 30

$$= 2949\ \text{psi}$$

# HOLSTER, DUTY BELTS AND ACCESSORY CASES OF LEATHER APPEARING MULTI-LAMINATE AND PROCESS FOR PRODUCING THE SAME

## REFERENCE TO RELATED APPLICATION

[0001] This non-provisional patent application claims benefit of U.S. provisional patent application serial No. 60/288,555 filed May 2, 2001, and hereby claims the benefit of the embodiments therein and of the filing date thereof.

## BACKGROUND OF THE INVENTION

[0002] It is common practice for law enforcement personnel, military personnel and others to carry holsters, duty belts, and related items, such as ammunition and handcuff pouches made of leather, and most recently, made from laminate materials, with the outer layer ballistic nylon fabric.

[0003] Items made of leather are considered by many to be the most desirable, as they offer a durable, very neat and professional look. Additionally, items made from leather may be tooled to include various designs, such as a basket weave or scalloped edges, all of which transform an otherwise functional leather item into a work of art.

[0004] On the other hand, products made of leather are relatively expensive and are susceptible to wear, mold and mildew. Leather items also have a tendency to absorb oils and grease, which may cause stains or discoloration and thus distract from their overall appearance. Finally, although leather items can be cleaned, they are not washable.

[0005] In an attempt to overcome the aforementioned problems associated with leather, many law enforcement and military product manufacturers turned to laminates as a leather replacement. Typically, a laminate would include an outside or skin layer of ballistic weave nylon, a core of polyfoam, and a soft inside liner layer.

[0006] Items made of such trilaminate materials avoid a number of the disadvantages of leather enumerated above. Trilaminates of the above type are not harmed by water and are durable. Oils and greases can be removed simply by washing the item. Further, trilaminate materials often times weigh less than their leather counterpart. Consequently, goods made from ballistic nylon faced trilaminate materials have gained popularity during the recent years.

[0007] One early recognized disadvantage of using trilaminate materials had been that they could never be made into shapes which held their edges having a neat and crisp appearance, similar to leather.

[0008] In order to overcome the appearance limitation associated with laminates, applicants herein co-invented a process described in U.S. Pat. No. 5,351,868 to Beletsky et al., whereby a ballistic nylon faced trilaminate material could be molded to form goods, such as holsters, duty belts and the like, having neat, well-defined contours, which hold their shape and are not deformed through use.

[0009] In spite of the strides made in the above-referenced U.S. patent, trilaminates, including those of ballistic nylon facing, still have certain disadvantages. Laminates, which have an exterior design reminiscent of, for example, hand-tooled leather, do not maintain their pattern or design when utilized in the above-referenced process described in Beletsky et al. U.S. Pat. No. 5,351,868. The pattern fades or is washed out, especially in these areas of high deformation, such as the article carriers, edges or contours. Military and law enforcement equipment made of laminates having an exterior design do not yield the same classical and professional appearance that leather does because heretofore trilaminates could not be both made to include the same artistic detail as tooled leather goods, such as scalloped edges or basket weave designs and still be molded to form goods having neat, well-defined contours.

[0010] There remains a need for laminates which can be molded to a permanent form that holds its shape and also has the look of tooled leather, including the ability to take and hold designs and artistic detail, such as scalloped edges and basket weave prints.

## BRIEF SUMMARY OF THE INVENTION

[0011] It is the object of the invention to make an article carrier which is lightweight, durable, inexpensive, easy to clean, and easy to maintain which also has the outward appearance of hand-tool leather with crisp, well-defined contours and edges.

[0012] Applicants have invented a process whereby laminates having a detailed design on their exterior, reminiscent of hand-tooled leather can be molded into items, such as holsters, which hold their shape and maintain the detail and crispness of their design. The laminates used herein also have a higher abrasion resistance than either leather or a woven nylon and are therefore more desirable.

[0013] The process involves taking flat sheet of trilaminate material comprised of an outer skin of non-woven randomly-oriented sheet nylon, which also includes a tooled appearance design, a core of preferably closed cell polyfoam, and a liner layer of soft, durable, material, and heating it to a temperature of between 250° F. and 330° F. for about 180 to 270 seconds. The heated laminate is then placed into the desired mold set, which normally includes both faces of the item joined at the most convenient location.

[0014] Orientation of the trilaminate material within the mold is critical and must take into consideration the natural stretch characteristics of the trilaminate material. Placement in the mold is such that the maximum stretch of the laminate material is parallel to the direction of maximum deformation in the mold.

[0015] The design and thus the clearance of the mold is critical to producing the product of this invention. Once the heated trilaminate is properly placed into the mold, the mold is closed, and once closed, the mold is cooled. The trilaminate material remains in the mold for a sufficient enough time to permanently fix the mold's design in the trilaminate. During the molding process, certain areas of the laminate material are severely compressed, while other areas are compressed to lesser amounts. The mold's clearance is also designed to accommodate for the resiliency characteristics of the outside skin, core and liner materials. The mold defines and fixes the shape of the laminate material.

[0016] The formed laminate sheet is removed from the mold and trimmed to define the outline shape of the sides. The molded trilaminate is completed by folding and attaching the sides together by stitching or bonding. At this time, component parts, such as belt loops may be attached if not attached previously.

[**0017**] One typical item employing this invention is a holster, which is made in a similar manner as to that described above. In such case, the inner lining is typically a closely woven fabric, which is a non-marring surface for the handgun carried. During molding, both sides of the holster are compressed and molded into a stiff, handgun-receiving configuration with the entire outer surface and particularly at the edges and corners having crisp, well-defined details similar, if not identical, to hand-tooled leather. The edges are trimmed then folded and the ends stitched or bonded together. Other items employing this invention are handcuff pouches, magazine pouches, and flashlight pouches. Each is made in a manner similar to the holster described above.

[**0018**] In the case of duty belts, the requirements are less severe than for pouches, since the only compression areas needed, if any, may be the edges which are normally covered with a binding material.

[**0019**] In each of the above-described items, the outside skin layer includes a design similar, if not identical, to that of hand-tooled leather, such as a basket weave. It is, therefore, necessary during the molding process, that the trilaminate material not only take and hold well-defined edges and corners but that the design of the laminate material retain its crisp definition throughout its entire surface. Prior art methods would not yield a molded trilaminate product having the crisp and detailed features of hand-tooled leather.

[**0020**] Applicants' article carrier exhibits the following features:

[**0021**] outer appearance of hand-tooled leather;

[**0022**] crisp, well-defined contours and edges;

[**0023**] made from a laminate material which is

[**0024**] lightweight

[**0025**] durable

[**0026**] easy to clean and

[**0027**] easy to maintain.

## BRIEF DESCRIPTION OF THE DRAWINGS

[**0028**] This invention may be more clearly understood with the following detailed description and by reference to the drawings in which:

[**0029**] **FIG. 1** is an outer side elevational view of the holster as a product of the invention showing the well-defined edges and crisp definite design;

[**0030**] **FIG. 2** is a perspective view of a piece of tooled laminate material used to produce the embodiment of **FIG. 1**;

[**0031**] **FIG. 2*a*** is a fragmentary sectional view taken along lines **2*a*-2*a*** of **FIG. 2**;

[**0032**] **FIG. 3** is a perspective view of the top half and the bottom half of the mold used to form a magazine pouch as shown in completed form in **FIG. 4**;

[**0033**] **FIG. 4** is a side view of a duty belt carrying a magazine pouch, flashlight pouch, handcuff pouch, glove pouch, baton holder, mace pouch, holster, and key case, all of which were made by the process of this invention;

[**0034**] **FIG. 5** is a flow chart describing the process for producing the molded items of this invention; and

[**0035**] **FIG. 6** is a simplified press system drawing partly sectional generally illustrating the press and gauge used to mold the trilaminate material and formulas used to determine the material pressure exerted upon the trilaminate.

## DETAILED DESCRIPTION

[**0036**] Referring now to **FIG. 1**, which is an outer side view of the holster embodiment **10** made employing this invention. **FIG. 1** illustrates the sharp, well defined, overall shape and edges **14** of holster **10**, as well as the crisp detail of the basket weave design **15** on the entire skin surface **21** of holster **10**, including severely formed corners. The basket weave design **15** gives the holster of **FIG. 1** the look of hand-tooled leather. Holster **10** is formed from a single sheet of a trilaminate **20** as shown in **FIG. 2** comprised of a skin layer **21** with a tooled outer face **15**, a polyfoam core layer **22**, and a soft liner layer **23** molded to define a weapon-receiving pocket, and stitched or bonded along the edge **11**, and preferably edged with a binding material **13**.

[**0037**] **FIG. 2** is a perspective view of a panel of a trilaminate material **20** used in the inventive process, which is comprised of an outside or skin layer **21** having a tooled appearance, a core layer **22** of closed cell polyethylene foam, and a liner layer **23** of a soft, durable fabric material. Each layer is attached to the adjacent layer by an adhesive. It is understood that laminate materials, other than trilaminates, may also be used employing this invention.

[**0038**] Turning now to **FIG. 2*a***, which is an enlarged section along lines **2*a*-2*a*** of **FIG. 2** illustrating the particular layers of the trilaminate **20** described above. The trilaminate material **20** includes an outside skin or layer **21** formed from a sheet of a non-woven, randomly-oriented synthetic fiber. A design, such as a basket weave **15**, is present on the outside surface of skin **21**, which gives the skin **21** the look of hand-tooled leather. The skin **21** must be capable of being both heated to more than 330° F. and rapidly chilled to approximately 40° F. without damage. Skin layer **21** must also be capable of tolerating molding pressures with little or no degradation to the design **15** on the outside of skin layer **21**.

[**0039**] In the preferred embodiment, the outside skin layer **21** is made of non-woven fabrics made of synthetic fibers sold under the trade name NYTEK® made by the Majilite Corporation of Dracut, Mass. An outside skin **21** of NYTEK® is preferred because it is durable, capable of being molded into and maintaining a form with well-defined, crisp, box-like edges. More particularly, it is capable of accepting and maintaining various designs that give the appearance of hand-tooled leather, which do not fade during the molding process of this invention. Also, NYTEK® has a higher abrasion resistance than either leather or a woven nylon, and is therefore more desirable. Finally, the NYTEK® material is approximately 30% to 40% lighter in weight than leather.

[**0040**] The core **22** is preferably made of closed cell cross-linked polyethylene foam. The core **22** material must be capable of tolerating a temperature of as high as 330° F.

and as low as about 40° F. during molding and molding pressures sufficient to compress the foam pores closed without degradation. In the preferred embodiment, the foam core **22** is either 10, 20 or 30 pound density, such as that made by Oletex, Inc. of South Holland, Ill., item numbers CKJN 1000 (10 lb. foam) or CKJN 2000 (20 lb. foam) or CKJN 3000 (30 lb. foam).

[**0041**] The Oletex 10 pound foam has a tensile strength of about 229.2 psi, a tear resistance of about 64.8 lbs./in. and an elongation of about 237.3. The Oletex 10-pound foam also has a compression strain at 10% of about 29.3 psi, and a compression strain at 25% of about 39.7 psi and a compression strain at 40% of about 53.5 psi. The Oletex 20 lb. foam has a tensile strength of about 534 psi, a tear resistance of about 132.2 lbs./in., an elongation of about 392.8. The Oletex 20 lb. foam also has a compression strain at 10% of about 94.1 psi, and a compression strain at 25% of about 130.2 psi, and a compression strain at 40% of about 198.7 psi. The Oletex 30-pound foam has a tensile strength of 650 psi, a tear resistance of about 200 lbs./in., an elongation of about 280. The Oletex 30 lb. foam also has a compression strain at 10% of 240 psi, and a compression strain at 25% of about 350 psi, and a compression strain at 40% of about 560 psi.

[**0042**] The liner material **23** may be made of any soft, yet durable, material which is capable of tolerating the temperature variations associated with molding and molding pressures without degradation. In the preferred embodiment, the liner **23** is a knit polyester.

[**0043**] The trilaminate **20** is made by bonding the skin layer **21** to one side of the core foam **22** using adhesives and bonding the liner **23** to the opposite side of the core foam **22** using adhesives. In the preferred embodiment, the adhesives used to bond the skin **21** to the core **22**, and the core **22** to the liner **23**, are designed to withstand the temperature variations associated with molding and molding pressures without degradation, e.g., the adhesives must be stable and not run or bleed through the knit fabric, and must keep the laminate material from delaminating or curling during the molding process. We have found the following adhesives to be satisfactory in the process. Skin-to-foam adhesive 1793 heat seal from the T. H. Glennon Co. of Salisbury, Mass., and the foam-to-liner adhesive to be XAF 20,800 from Sarna Xiro AG of Schmitten, Switzerland.

[**0044**] **FIG. 3** is a perspective view of both halves of the mold **30**, namely top and bottom mold parts **30**T and **30**B, used to form the magazine pouch **70** of **FIG. 4**. The clearance of mold **30** is designed with a maximum clearance of approximately 20% to 25% of the beginning thickness of the trilaminate material **20** at those locations along the finished product where well-defined and contoured edges are required. In other words, because of the configuration of mold **30**, a greater or lesser amount of pressure is exerted upon the trilaminate material **20** such that certain areas of the trilaminate **20** are more or less deformed.

[**0045**] Mold **30** is also designed to compensate for the spring compression or resiliency of the non-woven, randomly oriented skin **21** material, the polyfoam core **22** and the liner material **23**. More importantly, placement of the skin material **21** within the mold **30** must also take into account the stretch characteristics of the skin material **21**.

[**0046**] Permanent crush or deformation of the trilaminate material **20**, and in particular of the polyethylene core foam **22**, yields a product having neat, well-defined contours with sharp edges. In the preferred embodiment, the trilaminate material **20** before compression has a total thickness of about 3/16 inch. After compression, the total thickness of trilaminate material **20** at the point of greatest compression is about 3/64 inch, which represents about a 75% crush.

[**0047**] Mold **30** may be made from a variety of materials, such as steel or aluminum so long as the materials are designed to withstand molding pressures and temperatures of between about 330° F. and 40° F. Cooling of the mold typically occurs by either conventional cooling passages in the mold parts or by contact with chilled plates top and bottom. The mold **30** must also tolerate the molding pressure required to compress and bond the foam layer **22** to be formed. In the preferred embodiment, the mold **30** is made of 6061-T6 aluminum.

[**0048**] The elasticity characteristics of the skin **21** are utilized to control and therefore prevent the wash out or fade of the tooled-like design **15** on the outside of skin **21**. Applicants have identified the direction of maximum stretch of skin **21** and place the laminate material **20** into mold **30** such that the direction of maximum deformation within mold **30** is parallel to the direction of maximum stretch of skin **21**. In the case of products such as holsters, magazine cases and the like, the maximum deformation within mold **30** is along lines MD as shown in **FIG. 3**. The maximum stretch of the skin is typically the longitudinal direction of roll forming. Consequently, the trilaminate material **20** may to be molded into shapes which have well-defined edges **14** that also maintain the crispness of their tooled-like design **15** on skin **21**.

[**0049**] **FIG. 4** illustrates the various goods which may be made from the inventive multi-laminate process, including a handcuff pouch **50**, magazine pouch **70**, flashlight pouch **60**, mace pouch **40**, key case **65**, baton holder **75**, glove pouch **80**, and holster **10**, all of which exhibit a neat box-like appearance with contoured well-defined edges **14** as well as the crisp detail of the design **15** on the front side of skin **21**. Each item, including the duty belt DB, appears to be made from fine quality, hand-tooled leather when, in fact, each is made from a nylon faced multi-laminate material. The multi-laminate is more wear resistance than leather and has a higher abrasion resistance than either leather or woven nylon. The multi-laminate is also lighter in weight than leather.

[**0050**] **FIG. 6** is a fragmentary sectional view generally illustrating the press used to mold the trilaminate material **20**. Mold **30** is designed with a maximum clearance of approximately 20% to 25% of the beginning laminate material **20** thickness at those locations along the finished product where well-defined and contoured edges are required. Therefore, when mold **30** is closed, laminate material **20** is compressed at those areas determined by mold **30**. After mold **30** is closed, the laminate is cooled to aid in fixedly setting the shape of mold **30**, thus yielding a product with contoured edges and sharp corners.

[**0051**] **FIG. 6** also includes formulas used to calculate the material pressure exerted upon the laminate material **20** during the molding phase.

[**0052**] The Process

[**0053**] The process of manufacturing the aforementioned goods is described in detail below and illustrated in the flow diagram of **FIG. 5**. The design of mold **30**, the orientation of the trilaminate material **20** within mold **30**, the composition of the multi-laminate material **20**, the temperature, and cycle time all act together in concert, to yield a single molded product. The clearance of mold **30** is such that the trilaminate material **20** at some locations is crushed to where it appears to be nearly solid, while at other points along mold **30**, trilaminate material **20** is only partly crushed, but always maintaining its coherent structure and strength. The outside skin **21** maintains the detail and look of hand-tooled, fine quality leather **15** at each and every point along the outside skin **21** regardless of the amount of compression or crush exerted by mold **30** on the trilaminate material **20**.

[**0054**] The initial step is to select the laminate material **20**. Although the flow diagram of **FIG. 5** illustrates that one might begin with the individual components of, for example, a trilaminate **20** and bond the desired outside skin **21** to one side of the preferred core foam **22** with an adhesive and bond the desired liner layer **23** to the opposite side of the chosen core foam **22** with an adhesive, it is also possible to specify the desired components of the trilaminate material **20** and purchase the trilaminate material assembled. The preferred composite is a three-layer material having a skin layer **21** of NYTEK® with basket weave design **15**, commonly referred to as PARAWEAVE, bonded to a 30 lb. density polyethylene Oletex foam layer **22**, which in turn is bonded to a knit polyester liner layer **23**.

[**0055**] The bonded laminate material **20** is heated to a temperature of between 250° F. and 330° F. for about 180-270 seconds to thoroughly heat soak the trilaminate material **20**. The temperature is not high enough to damage or degrade the trilaminate material **20** or its design **15**. The heat softens without melting the laminate material **20**, and especially the core layer **22** so the laminate **20** may be molded. Heating also relaxes skin layer **21**, which aids in skin layer **21** being molded without degrading the design **15** on the outside of skin **21**.

[**0056**] After heating, the laminate material **20** is placed into the desired mold **30**. Orientation of the laminate material **20** within mold **30** is critical such that the direction of maximum stretch of skin **21** is parallel to the direction of maximum deformation MD caused by mold **30** best seen in **FIG. 3**. Proper orientation of the laminate material **20** within the mold aids in eliminating, fading or washing out of the skin design **15** during molding.

[**0057**] The process step of compressing the heated trilaminate material **20** is crucial to the success of producing a precisely formed product with an outside skin **21** having the appearance of hand-tooled leather **15**. In a typical molding process, almost all of the composite material is compressed somewhat from its uncompressed state. Fold lines in the product are produced by compression until the polyfoam pores are virtually closed.

[**0058**] The multi-laminate material **20** used, for example, to manufacture the magazine pouch **70** of **FIG. 4** has, before compression, an outside layer **21** of NYTEK® having a thickness of about 1/16 inch, a polyethylene foam layer **22** of about 2/16 inch thickness, and a woven fabric liner layer **23** of nominal thickness. The maximum compression required to yield the desired product occurs, among other places, at the edges of pouch **70**. After compression, the measured thickness at a point of maximum compression, such as an edge, is about 3/64 inch or about 75% compression. Through a microscope, or 10-power loupe, the polyethylene foam layer **22** pores, at a point of maximum compression, appear to be closed after molding.

[**0059**] Success in this process depends in large part upon the design of mold **30**. The clearance of mold **30** is such that, at the required locations, the maximum compression of mold **30** is about equal to 75% to 80% of the beginning laminate **20** thickness. Thus, once the heated laminate material **20** is properly placed into mold **30**, only pressure sufficient to close the mold is required. Once mold **30** is closed, the laminate material **20** is cooled, while remaining within closed mold **30** for a compression period of 90 to 180 seconds or a time sufficient to produce a permanent deformation in the multi-laminate material **20**.

[**0060**] Applicants have found the following press machines to be successful in yielding the desired products of this invention: Composite Press P-609, 100 ton capacity and Composite Press P-409, 75 ton capacity, manufactured by Accudyne Engineering and Equipment Company located at 7180 Scout Avenue, Bell Gardens, Calif., and Precision press S50R-24-6YE, 50 ton capacity, and Compression Press B24-3-MIC, 35 ton capacity, manufactured by PHI, located at 14955 East Salt Lake Avenue, City of Industry, Calif.

[**0061**] Thereafter, the molded trilaminate material **20** is removed from mold **30** and finished after being trimmed of excess material. The two sides of the trilaminate material **20** are folded together at fold lines just produced, bound and stitched or otherwise attached to complete the component, such as holster **10**. At this time, any components, which are not present and are required, such as a belt loop, may be attached.

[**0062**] The goods, which are the product of the aforementioned process and mold **30**, have the appearance of actual hand-tooled leather, and include crisp, detailed designs on their exterior face **15**. The illusion of leather is further advanced by the neat shape, well-defined edges and corners **14** of the goods. The resulting goods are durable, washable, more abrasion resistant, more stain resistant, and lighter weight than leather. Heretofore, prior art processes were not capable of producing a molded product from laminate materials having the crisp and detailed look of hand-tooled leather, as the laminate design would fade or wash out during molding.

[**0063**] While in the case of the embodiment described above, it is convenient to mold the front and rear faces together, it is recognized that it may, in some cases, be preferable to mold the front and rear panels separately.

[**0064**] The above-described embodiments of the present invention are merely descriptive of its principles and are not to be considered limiting. The scope of the present invention instead shall be determined from the scope of the following claims including their equivalents.

We claim:

**1**. A laminate article carrier having contours and crisp, well-defined edges whose exterior has the appearance of hand-tooled leather made by the process of:

selecting a laminate having at least an outer layer, a core and an inner layer bonded together;

said outer layer having a design reminiscent of tooled leather;

said outer layer having a directional plane of greater stretch than its traverse plane;

heating said laminate to a temperature sufficint to soften said laminate without degrading the outer layer design;

placing said heated laminate into a mold having different depths of deformation wherein said laminate's directional plane of greater stretch is parallel to the area of maximum deformation of the mold;

compressing selected areas of said laminate in said mold and subsequently cooling said laminate in said mold such that said selected areas of compression have a permanently reduced thickness resulting in a laminate having well-defined contours and edges with the outward appearance of hand-tooled leather; and

trimming said compressed laminate, if necessary, adding desired component parts and joining the edges of said compressed laminate together to complete the desired article carrier.

**2**. An item as described in claim 1 wherein said outside layer is non-woven randomly oriented nylon.

**3**. An item as described in claim 1 wherein said core is a closed cell polyethylene foam.

**4**. An item as described in claim 1 wherein said laminate is heated to between about 250° F. and 330° F. for between about 180 to 270 seconds.

**5**. An item as described in claim 1 wherein the laminate is compressed for between about 90 to 180 seconds.

**6**. An item as described in claim 1 wherein the mold is chilled.

**7**. A laminate article carrier having numerous contours and crisp, well-defined edges whose exterior has the appearance of hand-tooled leather made by the process of:

selecting a laminate having at least an outer layer, a core, and an inner layer bonded together;

said outer layer made from a non-woven, randomly oriented nylon capable of accepting and holding a design reminiscent of tooled leather;

said outer layer having a directional plane of greater stretch than its traverse plane;

said core made from a closed cell polyethylene foam;

heating said laminate to between about 250° F. and 330° F. for about 180 to 270 seconds;

placing said heated laminate into a mold having different depths of deformation such that said laminates directional plane of greater stretch is parallel to the area of maximum deformation of the mold;

compressing selected areas of said laminate in said mold at about 3000 psi for between about 90 to 180 seconds;

thereafter cooling said laminate in said mold such that said selected areas of compression have a permanently reduced thickness, resulting in a laminate having well-defined contours and edges with the outward appearance of hand-tooled leather; and

trimming said compressed laminate of excess, if necessary, to better define the article carrier, adding desired component parts and joining the edges said compressed laminate together to complete the desired article carrier.

**8**. A process for making a laminate article carrier having contours and crisp, well-defined edges whose exterior has the appearance of hand-tooled leather comprising:

selecting a laminate having at least an outer layer, a core, and an inner layer bonded together where said outer layer includes a design reminiscent of tooled leather and where said outer layer has a directional plane of greater stretch than its traverse plane;

heating said laminate to a temperature sufficient to soften said lamiante without degrading the outer layer design;

placing said heated laminate into a desired mold having different depths of deformation wherein said laminate's directional plane of greater stretch is parallel to the area of maximum deformation of the mold;

compressing selected areas of said laminate in said mold and subsequently cooling said laminate in said mold such that said selected areas of compression have a permanently reduced thickness resulting in a laminate having well-defined contours and edges with the outward appearance of hand-tooled leather; and

trimming said compressed laminate, if necessary, adding desired component parts and joining the edges of said compressed laminate together to complete the desired article carrier.

**9**. An item as described in claim 8 wherein said outside layer is non-woven randomly oriented nylon.

**10**. An item as described in claim 8 wherein said core is a closed cell polyethylene foam.

**11**. An item as described in claim 1 wherein said laminate is heated to between about 250° F. and 330° F. for between about 180 to 270 seconds.

**12**. An item as described in claim 8 wherein the laminate is compressed for between about 90 to 180 seconds.

**13**. An item as described in claim 8 wherein the mold is chilled.

* * * * *