

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
5 January 2012 (05.01.2012)

(10) International Publication Number
w o 2012/002925 A1

- (51) International Patent Classification:
F41H 1/02 (2006.01) F41H 1/00 (2006.01)
B32B 27/06 (2006.01)
- (21) International Application Number:
PCT/US2010/001856
- (22) International Filing Date:
29 June 2010 (29.06.2010)
- (25) Filing Language: English
- (26) Publication Language: English
- (72) Inventors; and
- (71) Applicants : BRONSTEIN, Lawrence G. [US/US];
13949 Shalestone Drive, Clifton, Virginia 20124 (US).
BRONSTEIN, Louis G. [US/US]; 13949 Shalestone
Drive, Clifton, Virginia 20124 (US).
- (74) Agents: FORDE, Remmon R. et al; Litman Law Of-
fices, Ltd., P.O. Box 41200, South Station, Arlington,
Virginia 22204 (US).
- (81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD,
SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report (Art. 21(3))

(54) Title: VEST INSERT FOR TACTICAL TRAINING

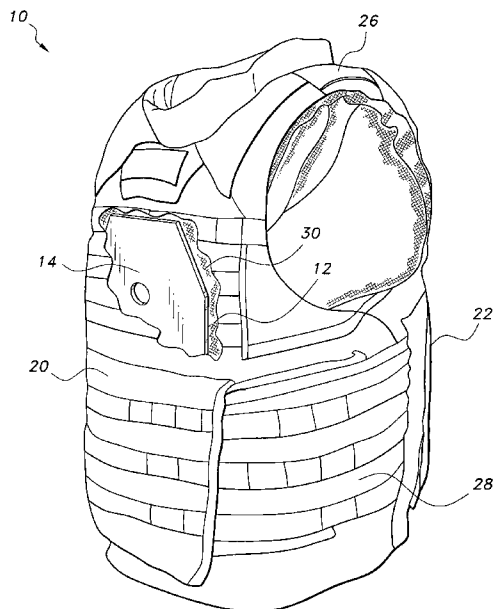


Fig. 1A

(57) Abstract: The vest insert for tactical training is an insert kit for retrofitting an outer tactical vest or the like for tactical training purposes. The vest insert includes front and rear training plates (14) adapted to be removably received within front and rear pockets (30) of front and rear carriers (20, 22) of an outer tactical vest (10). Each of the front and rear training plates (14) has an opening formed therethrough to indicate that the plate is for training purposes. Each of the front and rear training plates (14) is formed from polyvinyl chloride. Additionally, a pair of front and rear fabric panels (12) are provided to replace the inner panels of the outer tactical vest (10), each of the front and rear fabric panels (12) being formed from woven polyvinyl chloride. The training plates and the front and rear fabric panels (12) are sized and shaped to match the inserts and inner panels of a typical outer tactical vest (10).

WO 2012/002925 A1

VEST INSERT FOR TACTICAL TRAINING

BACKGROUND OF THE INVENTION

TECHNICAL FIELD

The present invention relates to ballistics vests and the like, and particularly to a vest
5 insert for tactical training that provides an insert kit for retrofitting an outer tactical vest or the
like for tactical training purposes with non-ballistic materials.

BACKGROUND ART

A ballistic or tactical vest is an item of protective clothing that absorbs the impact
from firearm-fired projectiles and shrapnel fragments from explosions. This protection is for
10 the torso. Soft vests are typically made from many layers of woven or laminated fibers, such
as Kevlar®, and protect wearers from projectiles fired from handguns, shotguns, and small
fragments from explosives such as hand grenades. When metal or ceramic plates are used
with a soft vest, the vest can also protect wearers from shots fired from rifles. In combination
with metallic components or tightly-woven fiber layers, soft armor can further offer some
15 protection to the wearer from stab and slash from a knife. Soft vests are commonly worn by
police forces, private citizens and private security guards, and hard-plate reinforced vests are
mainly worn by combat soldiers in the armies of various nations as well as police armed-
response units.

Fig. 2A illustrates a typical prior art outer tactical vest V, including front and rear
20 carriers 20, 22, joined together by straps 26 and fasteners, such as hook and loop fasteners,
and further including side carrier panels 28 and a ballistics collar 24. As best shown in Fig.
2B, the front carrier 20 includes a pocket 30, typically formed on the rear face thereof, for
receiving a small arms protective insert (SAPI) 32 or the like. A SAPI is typically a ceramic

plate formed from boron carbide, silicon carbide or the like. As shown in Fig. 2C, the SAPI 32 is contoured to comfortably mate with the user's torso, and may have indicia 34 formed thereon. Positioned between the rear face of the front carrier 20 and the user's torso is a front panel 21, typically formed from folded Kevlar® or the like. Such panels are fastened to the front carrier 20 through the usage of hook and loop fasteners or the like. A similar arrangement, including a rear pocket, a rear SAPI and a rear Kevlar® panel is typically provided for the rear carrier 22.

In order to provide further clarification, outer tactical vests (OTVs), such as exemplary vest V, typically include side and rear pockets for receiving fabric ballistic panels, and holding these panels in place. Typically, OTVs also include front and rear pockets for carrying the SAPI plates. Some OTVs function solely as rigid ballistic SAPI plate carriers, and training SAPI plates may directly replace ballistic plates as a training alternative.

Flexible ballistic armor fabric panels fit into the side and rear pockets, which are typically sewn into the OTV. The ballistic fabric panels typically hang by shoulder support straps that are held in place by hook and loop fasteners. The OTV pockets that carry the fabric panels are also typically closed by use of hook and loop fasteners.

The SAPI and Kevlar® panels of the typical outer tactical vest are bulky, unwieldy, relatively hot when worn, as folded Kevlar® is not a breathable material, and relatively difficult to clean. Although necessary for combat purposes, it would be desirable to provide more convenient and comfortable materials for training purposes. Thus, a vest insert for tactical training solving the aforementioned problems is desired.

DISCLOSURE OF INVENTION

The vest insert for tactical training is an insert kit for retrofitting an outer tactical vest or the like for tactical training purposes. A tactical training vest including the vest insert is

also contemplated. The vest inset for tactical training includes front and rear training plates adapted to be removably received within front and rear pockets of front and rear carriers of an outer tactical vest. Each of the front and rear training plates has a substantially arcuate cross-sectional configuration to match the curvature of the wearer's torso, and further has an opening formed therethrough. The opening indicates that the front and rear training plates are for training purposes. Indicia may also be formed on each training plate marking each plate as being for training purposes. Each of the front and rear training plates is formed from polyvinyl chloride.

Additionally, a pair of front and rear fabric panels is provided to replace the inner panels of the outer tactical vest (typically formed from folded Kevlar®). Each of the front and rear fabric panels is adapted for respective releasable attachment to a rear face of the front carrier and a front face of the rear carrier. Each of the front and rear fabric panels is formed from woven polyvinyl chloride. The front and rear fabric panels are attached to the front and rear carriers, respectively, by hook and loop fasteners or the like. The training plates and the front and rear fabric panels, although formed from polyvinyl chloride, are sized and shaped to match ceramic SAPIs and the Kevlar® inner panels of an outer tactical vest. Similarly, the training plates and front and rear panels have weights matching those of the actual combat materials, in order to provide proper simulation during training.

It should be noted that the training plates and the training panels do not provide ballistic protection. Further, both the plates and panels preferably are colored, in order to distinguish them as non-ballistic materials to prevent accidental usage in combat. Conventional SAPIs are black, whereas the training plates in the preferred embodiment are preferably extruded from white or light blue polyvinyl chloride. Similarly, the combat panels are typically colored green or in a multitude of camouflage colors. The training panels of the present invention are preferably formed as brown, gunmetal grey or black panels.

These and other features of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1A is an environmental perspective view of a vest insert for tactical training
5 according to the present invention, the vest being broken away to show the vest insert.

Fig. 1B is an exploded, environmental perspective view of the vest insert of Fig. 1
being applied to a front carrier of an outer tactical vest.

Fig. 2A is a perspective view of a prior art outer tactical vest.

Fig. 2B is a front view of the front carrier of the prior art outer tactical vest of Fig. 2A,
10 broken away to show a protective insert of the prior art.

Fig. 2C is a perspective view of a small arms protective insert according to the prior
art for use with the tactical vest of Fig. 2A.

Fig. 3 is a perspective view of a training plate of the vest insert for tactical training
according to the present invention.

Fig. 4 is an environmental perspective view of an alternative embodiment of the vest
15 insert for tactical training according to the present invention, the vest being broken away to
show the vest inserts.

Similar reference characters denote corresponding features consistently throughout
the attached drawings.

BEST MODES FOR CARRYING OUT THE INVENTION

20 Referring to Fig. 1A, there is shown a training vest 10 including the present vest insert
for tactical training. The vest insert for tactical training is an insert kit for retrofitting an outer
tactical vest or the like for tactical training purposes. Both the insert kit and the training vest
including the training insert are contemplated.

As shown in Fig. 1A, the front carrier 20, rear carrier 22, side carrier panels 28 and attachment straps 26 of the outer tactical vest V of Fig. 2A are utilized for training. It should be understood that the vest insert shown in Fig. 1A may be used with any type of tactical or bulletproof garment, and that the prior art outer tactical vest of Fig. 2A is shown for exemplary purposes only. The folded Kevlar® panel 21 and the SAPI 32 of Figs. 2B and 2C, however, are replaced in Fig. 1A by a front training panel 12 and a training plate 14. In Figs. 1A and 1B, only the front carrier 20 and a matching front training panel 12 and training plate 14 are shown. It should be understood that a matching rear training panel and rear training plate are also provided for attachment to the rear carrier 22.

10 The front and rear training plates 14 are respectively removably received within the front and rear pockets 30 of the front and rear carriers 20, 22 of the outer tactical vest 10. As described above, the prior art vest V, including front and rear carriers 20, 22, is shown for exemplary purposes only, as are the exemplary pockets 30. Each of the front and rear training plates 14 has a substantially arcuate cross-sectional configuration, as best shown in Fig. 3, to match the curvature of the wearer's torso. Each training plate 14 has an upper end 18 and a lower end 16. As shown in Fig. 3, the upper end 18 or upper portion may be substantially trapezoidal (or a curved trapezoid), and the lower end 16 or lower portion may be substantially rectangular (or a curved rectangle). The shape of the training plate 14 is designed to match that of the actual SAPI 32, which is used in combat.

20 Each training plate 14 is preferably formed by extruding solid polyvinyl chloride through a mold under pressure and heat to form a rigid, continuous running sheet, having widths varying from approximately 7½ inches to approximately eleven inches, depending upon the size of the SAPI that the training plate 14 is replacing. The running sheet is curved to match the front and back of the wearer's upper torso to provide a comfortable fit. The polyvinyl chloride sheets have thicknesses of approximately ¾ of an inch to simulate a

25

typical ballistic SAPI. Each sheet is then cut into lengths varying from approximately 1 1/2 inches to approximately fourteen inches, depending upon the size of the SAPI that the training plate 14 is replacing. It should be understood that the training plates 14 may be formed by any other suitable method, such as injection molding or the like. Each training
5 plate 14 may further include filler materials, such as wood, rubber or the like, allowing for the weight of each plate 14 to be varied in order to match that of the SAPI that the plate 14 replaces.

Further, as best shown in Fig. 3, the training plate has an opening 40 formed therethrough, which may be a circular aperture, as shown. The opening 40 provides a visual
10 indication that the front and rear training plates 14 are for training purposes only, in order not to confuse training plate 14 with the continuous surface of SAPI 32. The opening 40 preferably has a diameter of between approximately 1 1/2 inches and 2 1/2 inches. Indicia 42 may also be formed on each training plate 14, marking each plate as being for training purposes. Each of the front and rear training plates is formed from polyvinyl chloride.

15 Additionally, the pair of front and rear fabric panels 12 are provided to replace the inner folded Kevlar® panels 21 of the prior art outer tactical vest V. Each of the front and rear fabric panels 12 is adapted for respective releasable attachment to a rear face 21 of the front carrier 20 and a front face of the rear carrier. The front and rear fabric panels 12 are attached to the front and rear carriers, respectively, by hook and loop fasteners or the like.
20 The front and rear fabric panels 12 are attached to the front and rear carriers using the same type of releasable attachment used by the folded Kevlar® panels 21, which they replace.

Each of the front and rear fabric panels 12 are formed from woven polyvinyl chloride. The training plates 14 and the front and rear fabric panels 12, although formed from polyvinyl chloride, are sized and shaped to match ceramic SAPIs 32 and the Kevlar® inner
25 panels 21 of the outer tactical vest V. Similarly, the training plates 14 and front and rear

panels 12 have weights matching those of the actual combat materials in order to provide proper simulation during training. The polyvinyl chloride training plate 14, however, is easier to clean, as is the woven polyvinyl chloride fabric panel 12. The woven polyvinyl chloride fabric panel 12 is also more flexible and is breathable, when compared to the folded Kevlar® inner panels 21. Training plates 14 and fabric panels 12 are also less expensive to produce and replace than the combat materials that they replace during training.

It should be noted that the training plates and the training panels do not provide ballistic protection. Further, both the plates and panels preferably are colored, in order to distinguish them as non-ballistic materials to prevent accidental usage in combat. Conventional SAPIs are black, whereas the training plates in the preferred embodiment are preferably extruded from white or light blue polyvinyl chloride. Similarly, the combat panels are typically colored green or in a multitude of camouflage colors. The training panels of the present invention are preferably formed as brown, gunmetal grey or black panels.

It should be understood that the vests shown in the drawings are shown for exemplary purposes only. For example, a variant of vest V may include a pair of side panels replacing the single front panel shown. Thus, the vest may only have a pair of side training panels and a rear training panel. It should be understood that the vest insert contemplates replacement of the Kevlar® inner panels of an outer tactical vest, and the replacement training panels match in number, size and shape the Kevlar® inner panels, and that the number, size and shape of the training panels is not limited to the exemplary panels shown in the drawings.

Additionally, it should be understood that additional training plates may be used. For example, in the alternative embodiment of Fig. 4, the typical tactical vest also includes a side pocket 130 formed in side carrier 28 for receiving a side SAPI, as is conventionally known. For such a vest, a side training plate 114 is removably placed within the side pocket 130 of the side carrier 28, replacing the side SAPI, as described above with respect to the front and

rear training plates 14. Similar to that described above with respect to front and rear training plates 14, a side fabric panel 112 is provided to replace the inner folded Kevlar® panel of the prior art outer tactical vest V, corresponding to the side carrier 28. The side fabric panel 112 is adapted for respective releasable attachment to an inner face of the side carrier 28 by hook and loop fasteners or the like, as described above. Side training plate 114 has an opening 140 formed therethrough, similar to opening 40, to visually indicate that this plate is for training purposes only.

It should be noted that, in the above, the non-ballistic training panels which replace the ballistic Kevlar® panels do not require hook and loop fasteners at the shoulder supports (unlike the typical prior art ballistic fabric panels). The training panels themselves are sufficiently rigid to fit into the OTV panel insert pockets without the need for fasteners. This enables the panels to provide structural support for the OTV system. This further enables the tactical training vest system to carry the weight and form of front and rear SAPI plates. Thus, the usage of the non-ballistic training SAPI plates and non-ballistic flexible fabric insert panels allows for realistic simulation, in terms of size, weight and functionality, of OTVs equipped with actual ballistic armor panels and plates.

It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

CLAIMS

We claim:

1. A vest insert for tactical training, comprising:

front and rear training plates adapted to be removably placed within front and rear
5 pockets of front and rear carriers, respectively, of a tactical vest, each of the front and rear
training plates being substantially arcuate in cross section and having an opening formed
therethrough, each of the training plates being formed from polyvinyl chloride;

front and rear fabric panels adapted for releasable attachment to a rear face of the
front carrier and a front face of the rear carrier, respectively, each of the panels being formed
10 from woven polyvinyl chloride; and

means for releasably attaching the fabric panels to the front and rear carriers.

2. The vest insert for tactical training as recited in claim 1, wherein each of said front
and rear training plates has upper and lower portions, the upper portion being substantially
trapezoidal.

3. The vest insert for tactical training as recited in claim 2, wherein the lower portion
15 of each of said front and rear training plates is substantially rectangular.

4. The vest insert for tactical training as recited in claim 3, wherein the aperture is
substantially circular.

5. The vest insert for tactical training as recited in claim 1, wherein said means for
20 releasably attaching the fabric panels to the front and rear carriers comprises hook and loop
fasteners.

6. A vest insert for tactical training, comprising:

a front training plate adapted to be removably placed within a front pocket of a front
carrier of a tactical vest, the front training plate being substantially arcuate in cross section
25 and having an opening formed therethrough;

a front panel adapted for releasable attachment to a rear face of the front carrier; and means for releasably attaching the front panel to the front carrier.

7. The vest insert for tactical training as recited in claim 6, wherein said front training plate has upper and lower portions, the upper portion being substantially trapezoidal.

5 8. The vest insert for tactical training as recited in claim 7, wherein the lower portion of said front training plate is substantially rectangular.

9. The vest insert for tactical training as recited in claim 8, wherein the aperture is substantially circular.

10. The vest insert for tactical training as recited in claim 9, further comprising:

10 a rear training plate adapted to be removably placed within a rear pocket of a rear carrier of the tactical vest, the rear training plate being substantially arcuate in cross section and having an opening formed therethrough;

a rear fabric panel adapted for releasable attachment to a front face of the rear carrier; and

15 means for releasably attaching the rear panel to the rear carrier.

11. The vest insert for tactical training as recited in claim 10, wherein each of said front and rear panels is formed from woven polyvinyl chloride.

12. The vest insert for tactical training as recited in claim 11, wherein each of the front and rear training plates is formed from polyvinyl chloride.

20 13. The vest insert for tactical training as recited in claim 12, wherein the rear training plate has opposed upper and lower portions, the upper portion being substantially trapezoidal.

14. The vest insert for tactical training as recited in claim 13, wherein the lower portion of the rear training plate is substantially rectangular.

15. The vest insert for tactical training as recited in claim 14, wherein the aperture is a substantially circular contour.

16. The vest insert for tactical training as recited in claim 15, wherein said means for releasably attaching the fabric panels to the front and rear carriers comprises hook and loop
5 fasteners.

17. A tactical training vest, comprising:

a front carrier having opposed front and rear faces and a front pocket formed on the rear face;

a rear carrier having opposed front and rear faces, the front and rear carriers being
10 releasably attached to one another to form a vest;

a rear pocket formed on the front face of the rear carrier;

front and rear training plates removably disposed within the front and rear pockets, respectively, each of the training plates being substantially arcuate in cross section and having an opening formed therethrough, each of the training plates being formed from
15 polyvinyl chloride; and

front and rear fabric panels releasably attached to the rear face of the front carrier and the front face of the rear carrier, respectively, each of the fabric panels being formed from woven polyvinyl chloride.

18. The tactical training vest as recited in claim 17, further comprising means for
20 releasably attaching the fabric panels to the front and rear carriers.

19. The tactical training vest as recited in claim 18, wherein each of said front and rear training plates has upper and lower portions, the upper portions each being substantially trapezoidal and the lower portions each being substantially rectangular.

20. The tactical training vest as recited in claim 19, wherein the means for releasably
25 attaching the fabric panels to the front and rear carriers comprises hook and loop fasteners.

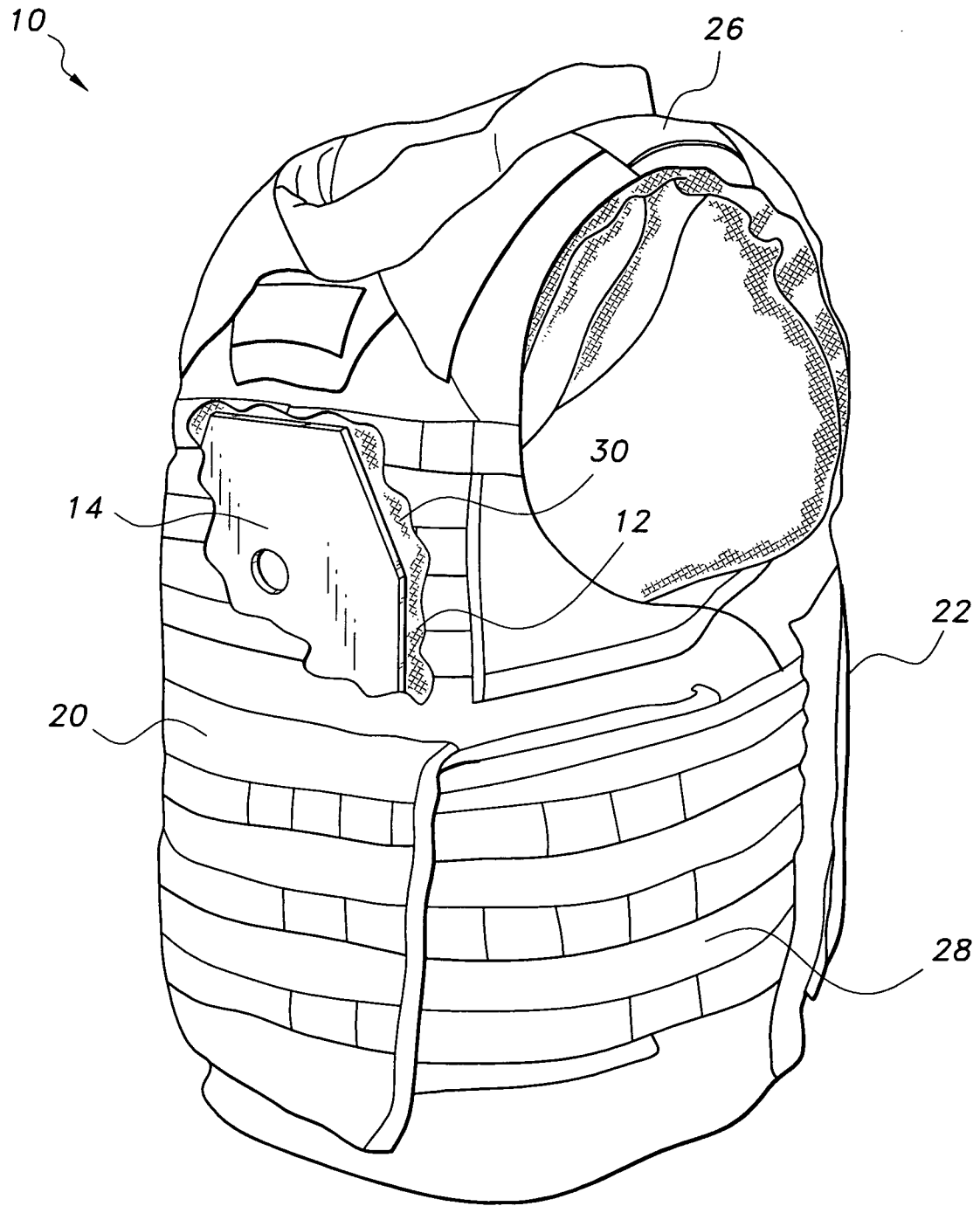


Fig. 1A

2/7

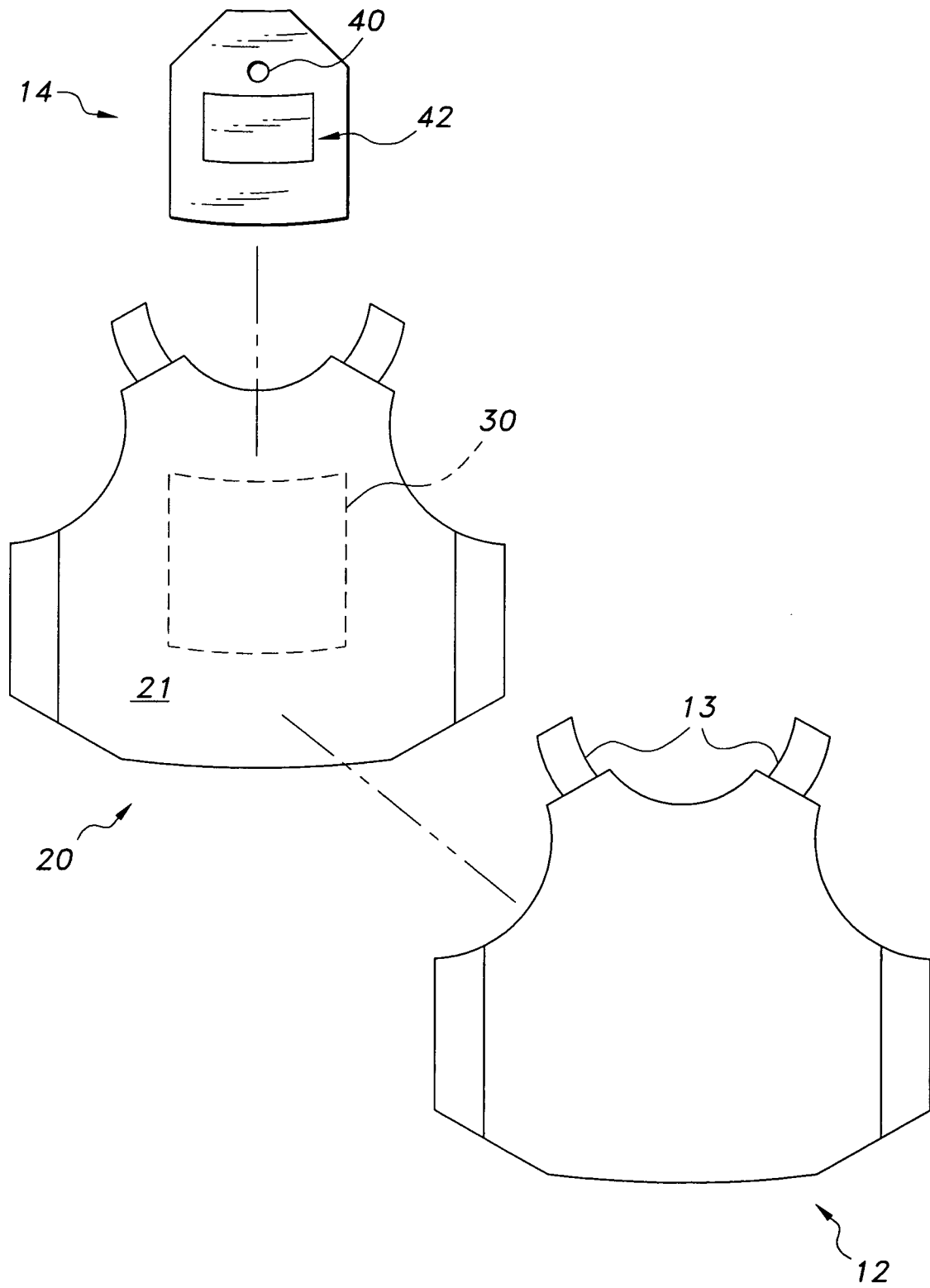


Fig. 1B

3/7

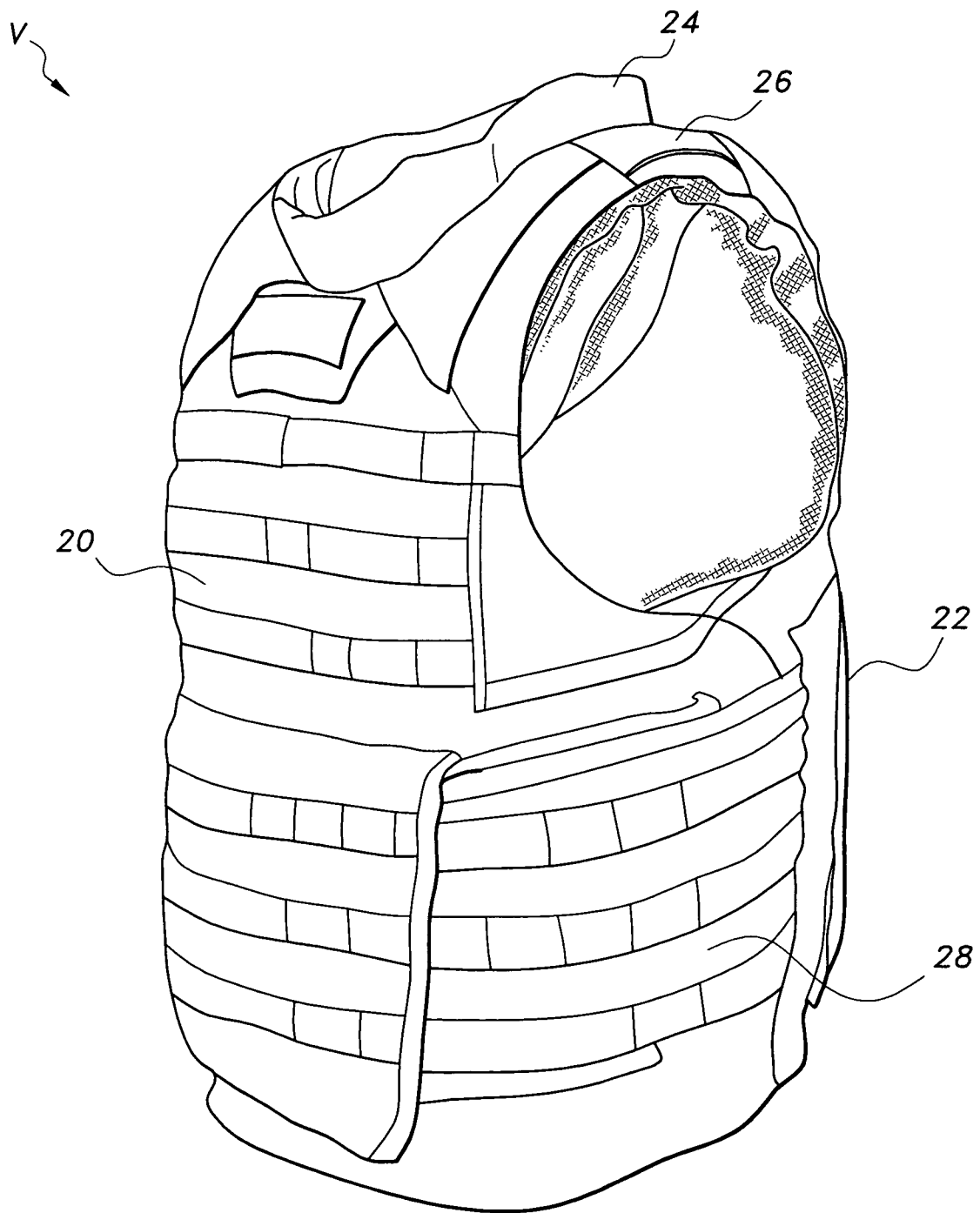


Fig. 2A

PRIOR ART

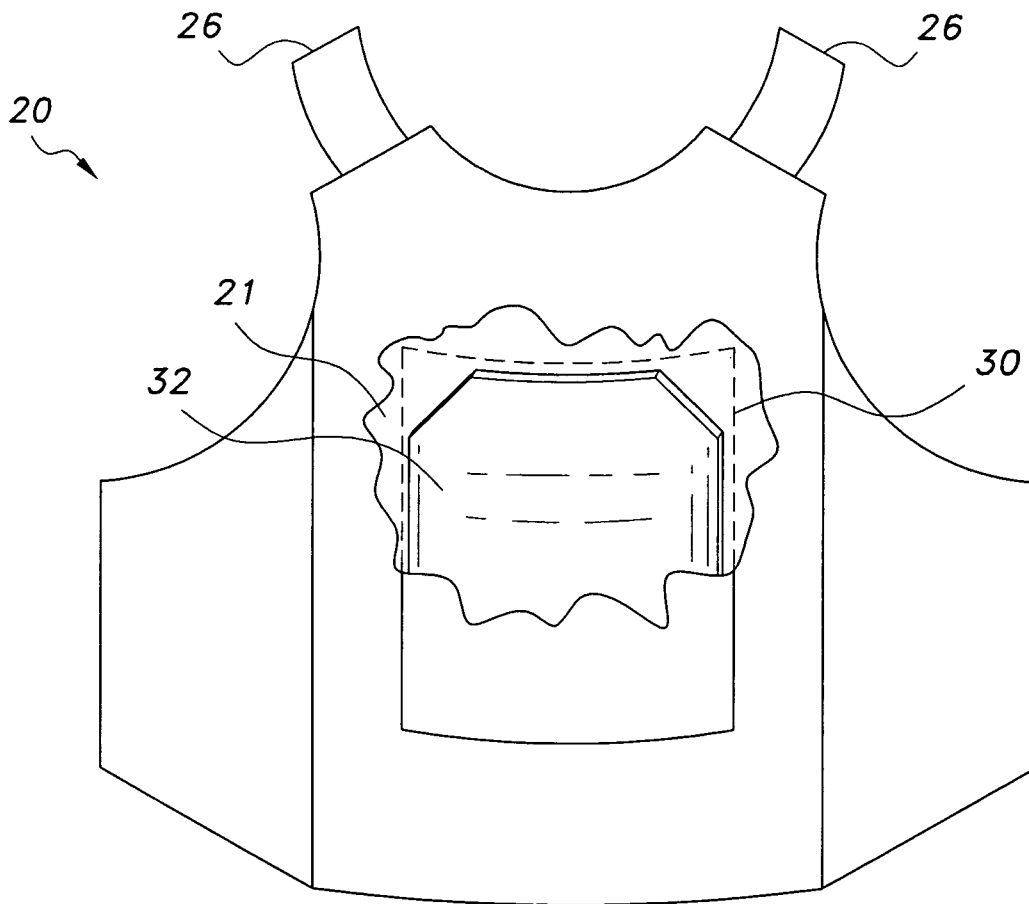


Fig. 2B

PRIOR ART

5/7

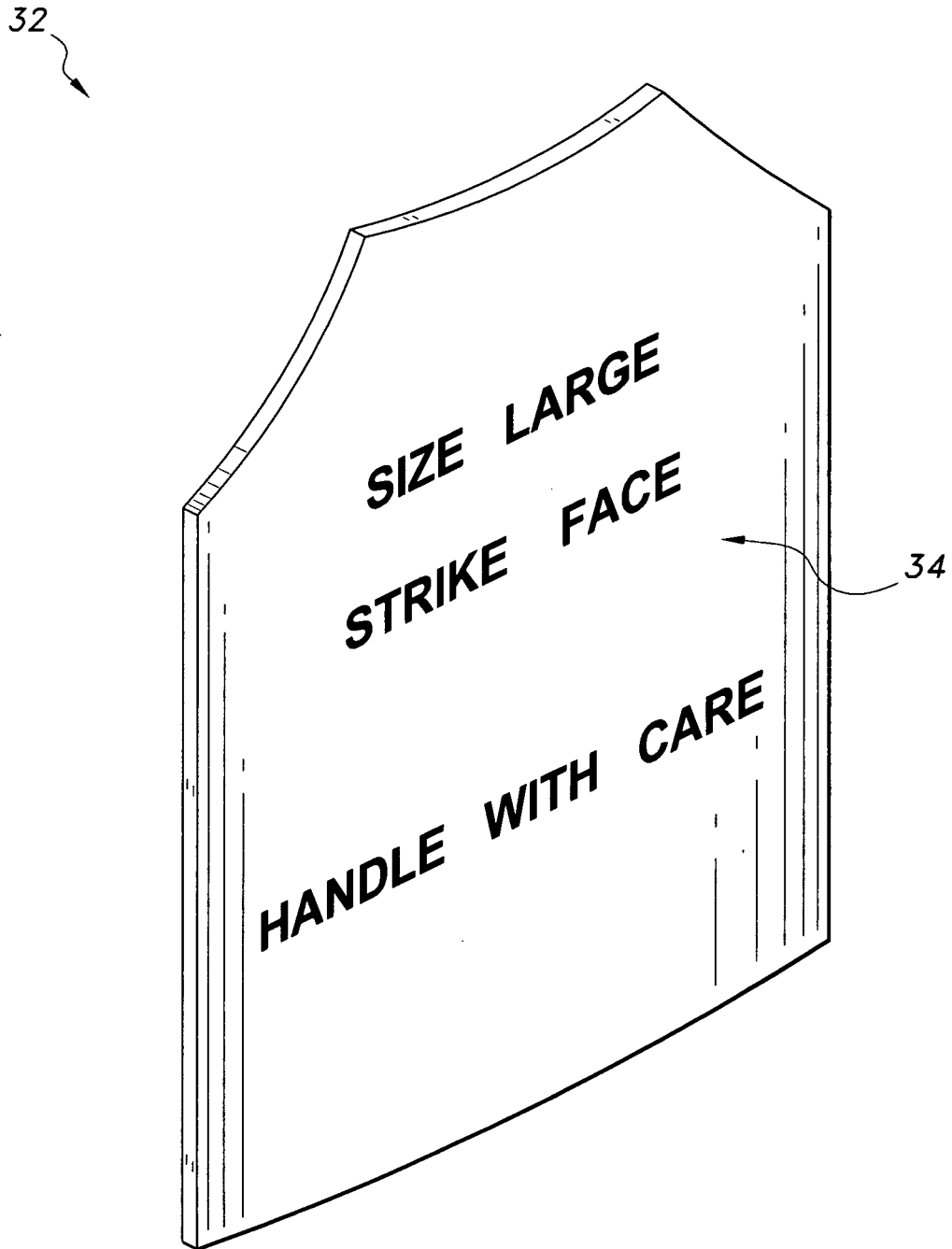


Fig. 2C

PRIOR ART

6/7

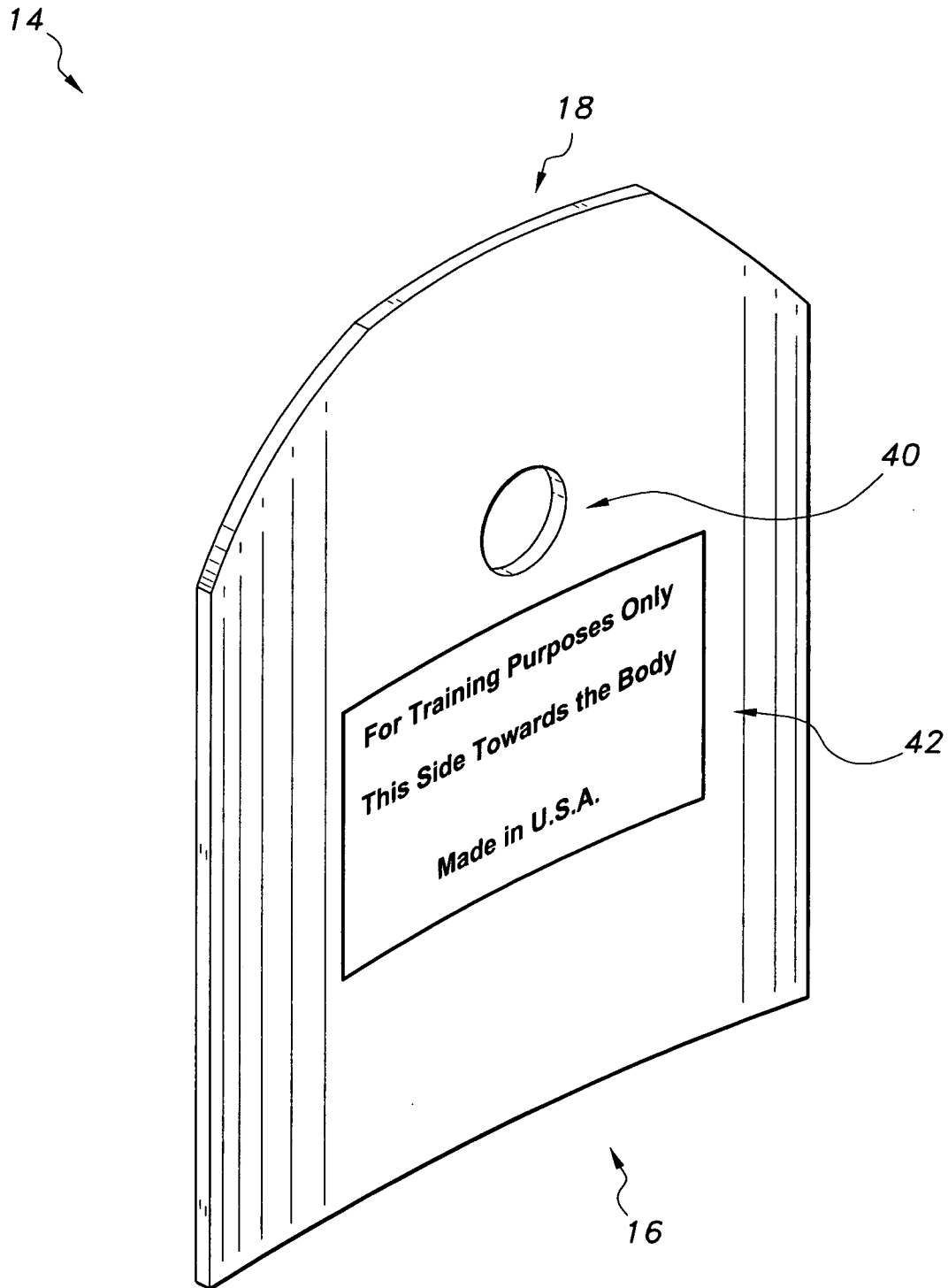


Fig. 3

7/7

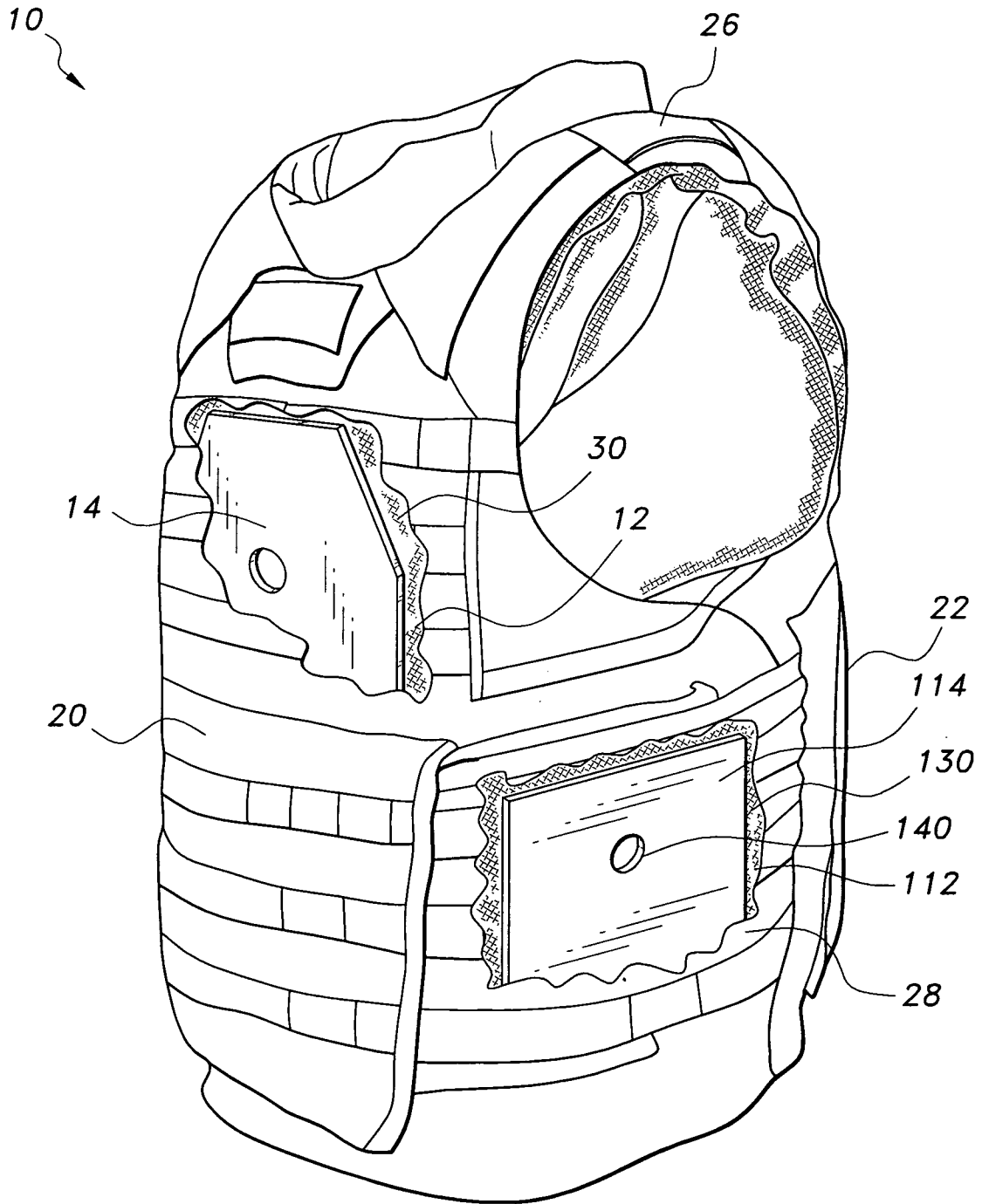


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/001856**A. CLASSIFICATION OF SUBJECT MATTER****F41H 1/02(2006.01)i, B32B 27/06(2006.01)1, F41H 1/00(2006.01)1**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F41H 1/02; F41M 1/02; A41D 13/00; F41M 1/04; A41D 1/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords; vest,training, polyvinyl chloride

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003-0079271 A1 (SHERRY S. GILLEN et al.) 01 May 2003 See Abstract and paragraph [0060]	1-20
A	US 6185738 B1 (SIDEBOTTOM; BETTY A.) 13 February 2001 See Abstract and Figures 5-6	1-20
A	US 2006-0143771 A1 (CHRISTOPHER WINKLE et al.) 06 July 2006 See Abstract	1-20

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

31 DECEMBER 2010 (31.12.2010)

Date of mailing of the international search report

03 JANUARY 2011 (03.01.2011)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-
gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

YEO, Kyeong Sook

Telephone No. 82-42-481-5612



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2010/001856

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003-007927 1 A1	01.05,2003	US 2003-0079277 A1 US 2004-0199983 A1 US 2006-0048292 A1 US 6446273 B1 US 6553579 B1 US 6738984 B2 US 6966070 B2 US 7 18 1772 B2 wo 03-037438 A1	01.05,2003 14.10,2004 09.03,2006 10.09,2002 29.04,2003 25.05,2004 22.11,2005 27.02,2007 08.05,2003
US 6 185738 B1	13.02,2001	None	
US 2006-0 143771 A1	06.07,2006	US 7076806 B1 wo 2007-084108 A2 wo 2007-084108 A3 wo 2007-084108 A3	18.07,2006 26.07,2007 09.04,2009 26.07,2007