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Schaefer

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[54] **BALLISTIC CLIP BOARD**

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[52] **U.S. Cl.**..... **109/49.5,** 109/58.5, 281/45

[51] **Int. Cl.**..... **E06b 9/00**

[58] **Field of Search**..... 281/45; 89/36 R, 36 A–F, 89/36 L; 109/49.5; 160/351; 141/97; 273/102.4; 402/70

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[57] **ABSTRACT**

There is provided a ballistic clipboard having a transparent zone at least above the clip for visual observation by the holder of the clipboard, the clipboard having low shrinkage characteristics and a tensile yield strength of at least 9,000 psi and a tensile break strength of at least 8,000 psi. The preferred material of construction is virgin polycarbonate and in the preferred construction the clipboard is provided with a handle to aid in holding the clipboard and to provide a means for using the clipboard as a defensive weapon.

8 Claims, 3 Drawing Figures

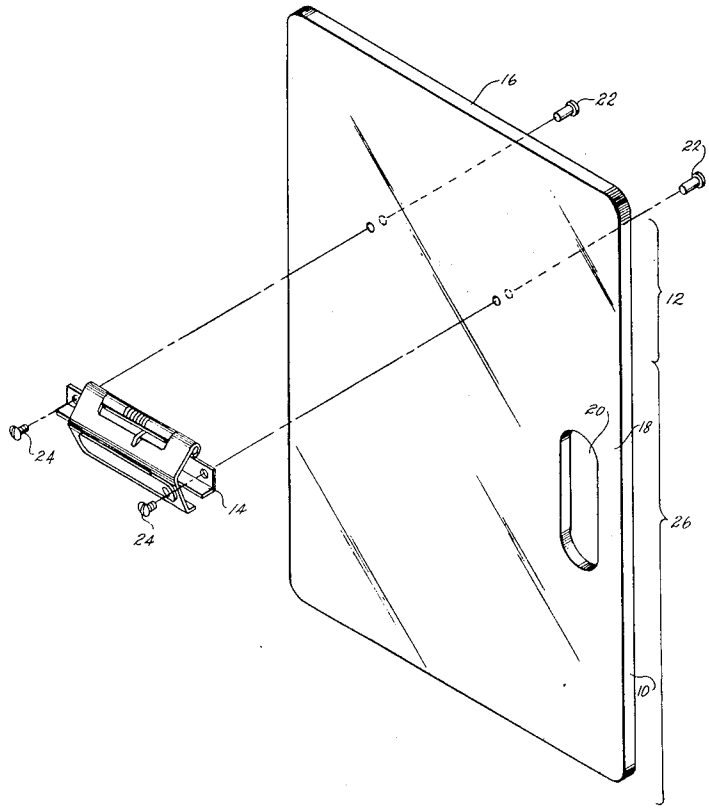


FIG_1

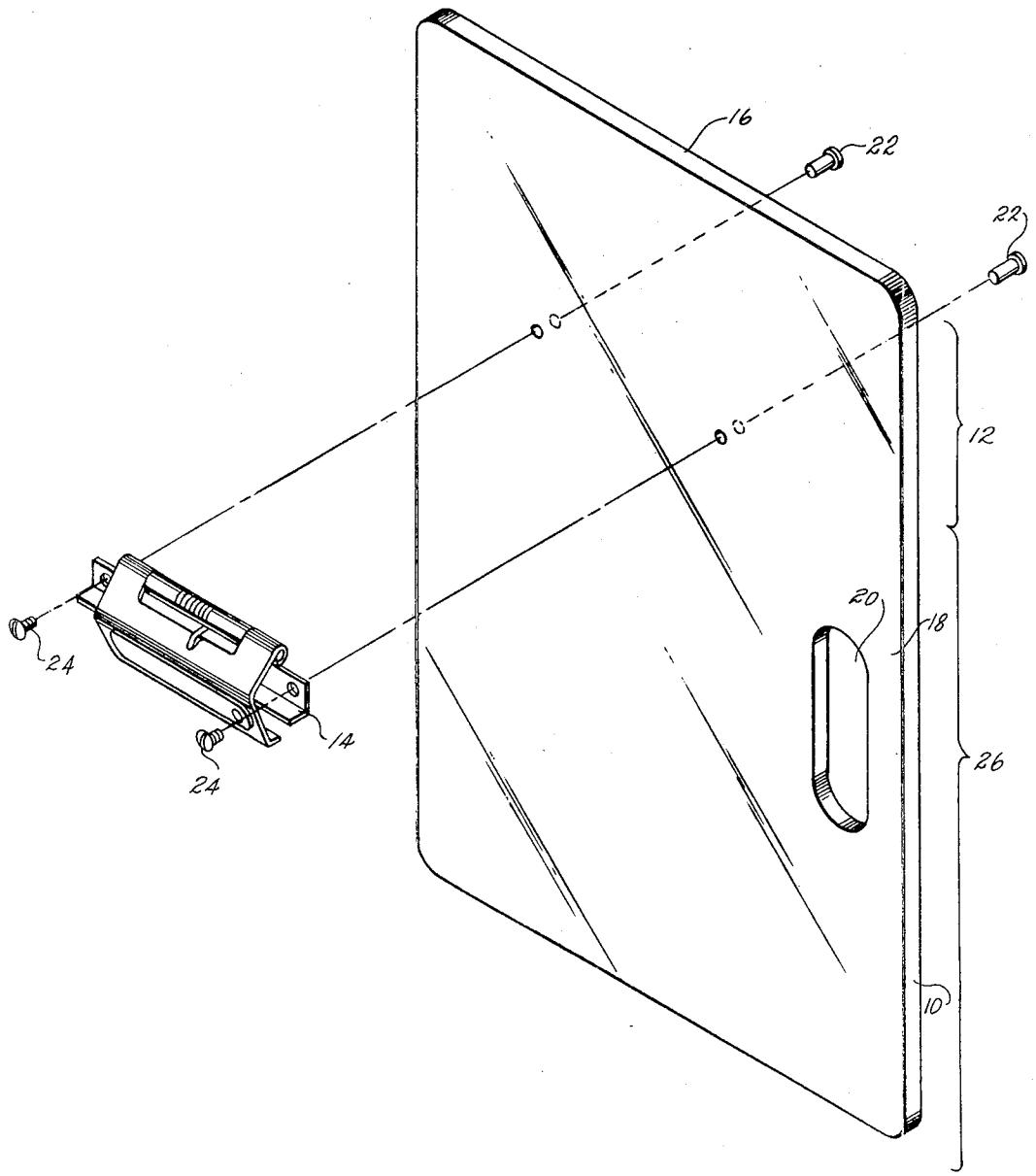


FIG. 2

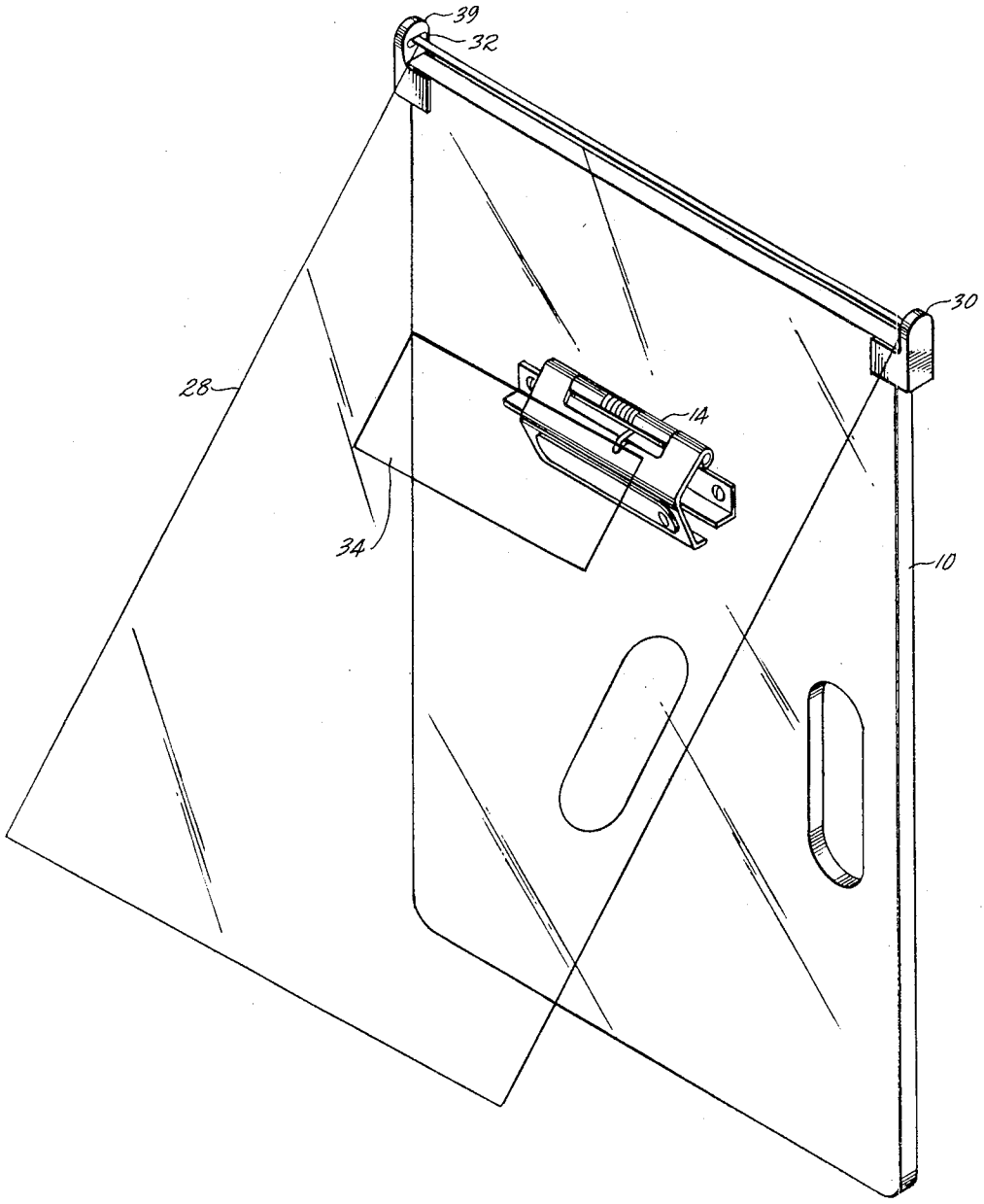
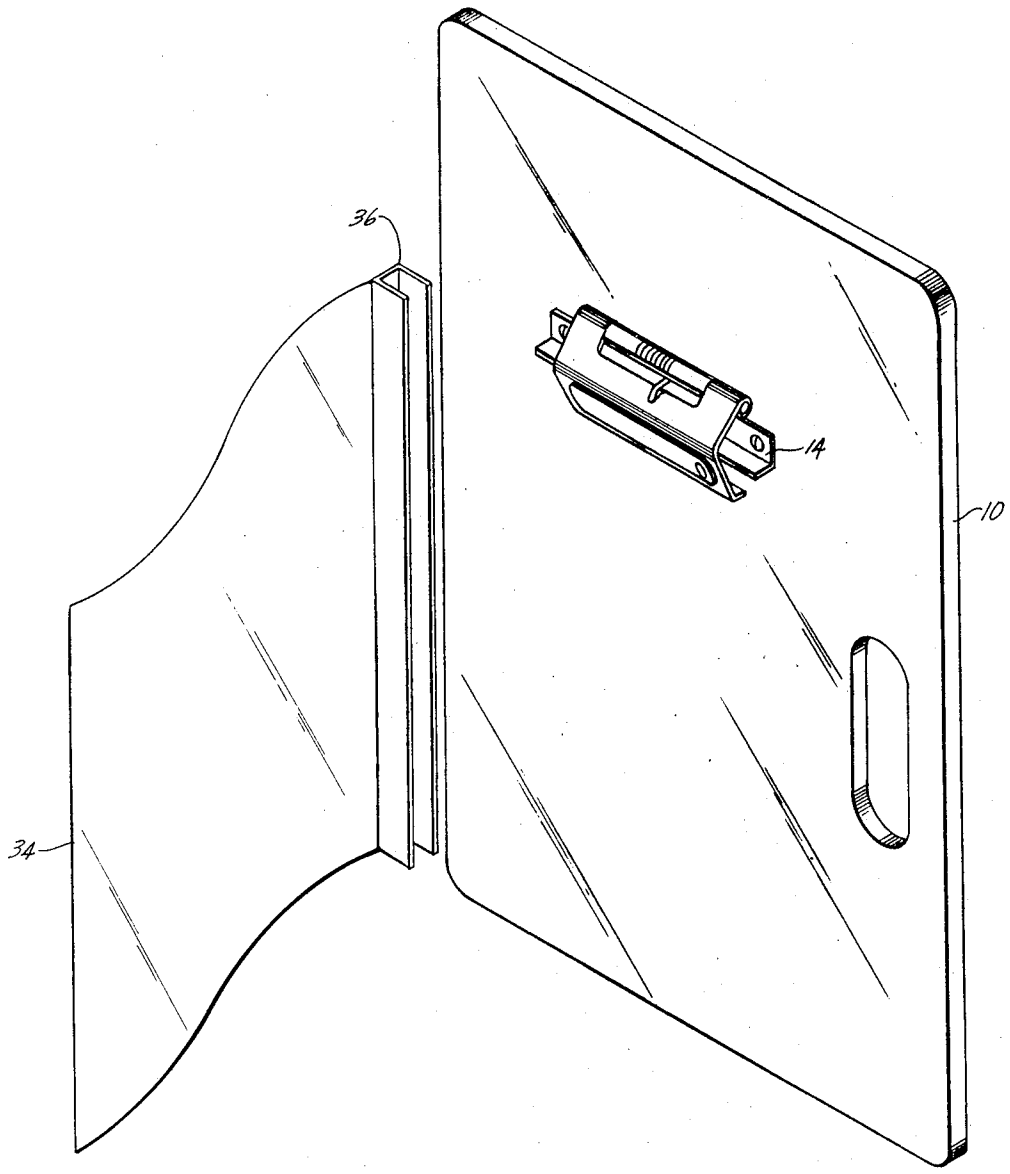


FIG. 3



BALLISTIC CLIP BOARD

BACKGROUND OF THE INVENTION

An accessory most readily available in the hands of a police officer when approaching a potential civil or criminal suspect is a clipboard. Where the suspect is believed to have criminal intent or engaged in criminal action, the officer may also have his revolver or other weapon drawn.

In many instances, a suspect is approached as a consequence of what the police officer believes to be a minor civil infraction. At this point in time, the officer may only anticipate the issuance of a citation and the papers assoicated with issuance of the citation or in making a report based on the investigation are attached to his clipboard.

The suspect, on the other hand, because of his frame of mind may have reason to believe that the peace officer is approaching him for other reasons which may be criminal in nature for past or present acts of the suspect.

An example of such a situation is where the peace officer stops a moving vehicle for a traffic infraction. The driver, however, may have committed a crime, be in the processess of committing a crime, or is in possession of materials which would constitute a crime.

The driver, unaware of the officer's actual intent may draw a pistol with the intent of shooting the approaching police officer.

The officer normally does not have an opportunity to act in this situation until the pistol in the hands of a suspect is observed and the time available for the officer to respond by drawing his own pistol may be too short to prevent injury.

SUMMARY OF THE INVENTION

According to the present invention there is provided a ballistic clipboard which serves, in addition to its normal function, as a protective shield which is capable of resisting penetration of a bullet at least to the extent that no, or virtually little, harm will be done to the officer protected by the shield as a consequence of a shot fired in the direction of and received by the protective clipboard.

The basic ballistic clipboard of this invention comprises a ballistic shield having mounted thereon a clip for attachment of papers and the like, the clip being positioned within the periphery of the shield and at a sufficient distance below the upper edge of the shield, and providing zone between the clip and the upper edge of the shield which is transparent to permit the peace officer to maintain visual observation of the situation being confronted while maintaining protection for the forehead of the officer.

The ballistic shield is further dimensioned to provide protection for the vital organs of the police officer when held in a crouched position.

In the preferred construction, the entire shield is transparent and made from a polymeric material having the properties providing a tensile yield of 9,000 psi or more and a tensile break of 8,000 psi or more, as measured by conventional ASTM methods, and has low shrinkage characteristics to minimize internal stresses induced during fluctuation in temperatures.

The presently preferred polymeric material is a virgin polycarbonate which will provide a shield of the aforementioned properties at a ballistic shield thickness of about 0.375 inch.

It is also preferred to provide the shield with a handle which may be provided as part of the mold or by cutting a hole in the ballistic shield board member and means to reverse the clip so that the shield can be held in the right or left hand, depending upon the characteristic desires of the peace officer.

The provision of a handle not only facilitates manipulation of the clipboard, as such, but also converts the clipboard into a hand held defensive weapon having substantial striking force.

Alternate embodiments of the invention include providing cover for the face of the clipboard to protect clip held papers under inclement weather conditions and to provide a metallic or thin insert in the zone beneath the clip where transparency is not required, as well as the use of a non-transparent polymeric material in the zone below the clip. The polymeric material used is sufficiently compatible with the polymeric material used in the transparent zone above the clip to the extent that the two may be fused and/or bonded to provide the uniform tensile and break strength characteristics set forth above.

THE DRAWINGS

FIG. 1 is an illustration of the preferred ballistic clipboard construction of this invention illustrating its breakdown construction which enables reversal of the clip and when there is provided a handle as part of the clipboard.

FIG. 2 is an illustration of an alternate embodiment in which there is provided a shield which is hinged to the ballistic clipboard to protect the contents during inclement weather conditions.

FIG. 3 represents yet another alternate embodiment of FIG. 2 when there is used simply a thin film insert for the clipboard again to protect the contents of the clipboard under inclement weather conditions.

DESCRIPTION

According to the present invention, there is provided a ballistic clipboard for use by peace officers and the like and which serves as a shield to protect the peace officer from bullets and other projectiles fired from pistols of a ballistic size capable of firing bullets at a muzzle velocity up to about 1,000 feet per second independent of caliber size.

Basically, the ballistic clipboard of this invention comprises a ballistic shield having a tensile yield strength of at least 9,000 psi and a tensile break strength of at least 8,000 psi, as measured by ASTM D-638, to which there is attached a clip at a point below the upper edge of the clipboard to provide above the point of attachment a transparent zone to permit a police officer to view the conditions before him while employing the clipboard as a shield to protect his forehead while the balance of the ballistic clipboard protects other vital organs of the body.

The portion below the clip may be transparent or translucent and may contain strengthening elements such as metal inserts, fiberglass cores and the like.

There may also be preferably provided an integral handle provided by a ballistic shield molding, a cutout from the ballistic shield which facilitates handling of the shield under normal conditions and when used as a shield permits the officer to hold the shield with one

hand as a protective measure while reaching for his pistol or other weapon with the other hand free.

Alternate embodiments of the invention include providing overlaying pivoted protective cover to protect the contents of the clipboard under inclement weather conditions.

With reference first to FIG. **1**, there is shown in breakdown the construction of a preferred ballistic clipboard of this invention. The clipboard comprises a board member **10** which may be (as shown) entirely transparent but is at least transparent at zone **12**, at the region above that occupied by attached clip **14**. The transparent area provided by zone **12** extends the width of the board and preferably downward from upper edge **16** of board member **10** to from about 4 to about 6 inches, and more preferably to about 5 to about 6 inches to provide an area sufficiently large to permit the police officer to view activity before him while the board is held to protect his forehead against attack.

The ballistic board is preferably provided with handle **18** generally provided by cutout or aperture **20**.

While clip **14** may be permanently mounted to board member **10**, clip **14** is preferably reversible for adaptability to peace officers having both right and left handed tendencies. This may be accomplished through the use of grommets **22** adapted to couple with mating screws **24** in order that clip **14** may be mounted on either side of board member **10** as desired.

The use of removable clips has another advantage. While the clipboard is designed to protect the police officer against bullets shot from pistols of most calibres, higher calibre pistols may tend to shatter or crack the board and therefore terminate its utility. Bullets shot from lower calibre pistols however may have little or no effect upon the board allowing its use as a defensive shield for a repeated number of times.

When the board is damaged to the extent where its protective value becomes questioned, clip **14** may be removed and replaced on a new board member **10**. This permits clips **14** to be used an extended number of times with many board members.

As indicated, board member **10** to be effective as a ballistic board, must have a low elongation to prevent internal stresses, a net yield strength of at least 9,000 psi and a net tensile break strength of at least 8,000 psi as measured by ASTM D–6300.

Where (as shown) the entire ballistic board **10** is made of a transparent material these characteristics can be achieved using a polycarbonate resin having the general physical properties: specific gravity 1.2, a heat deflection at 240 psi of 265° to 285° F; continuous resistance to heat of 250° F; a tensile modulus of 3.5×10^5 psi, a tensile strength of 12,500 psi and a flexule strength of 13,000 psi.

When a virgin polycarbonate of the above properties is extruded to a thickness of 0.375 inch, the aforementioned tensile yield and tensile strength properties will be realized.

These specifications, however, will not be realized if there is employed reground or reprocessed resin.

Where only zone **12** is transparent, the portion below it, **26**, may be opaque and fabricated from other materials which will provide equal tensile yield and tensile break strengths either along or as a consequence of fillers or inserts. Lower portion **26**, however, must be capable of being molded into or fused to upper zone **12** providing a joint providing the required tensile yield and break strengths.

There may be employed, for instance, for zone **26**, glass filled polycarbonates which generally have higher heat deflection temperatures, compressive strengths and flexule strengths and which may be readily fused to a polycarbonate used for transparent zone **12**.

There may also be employed reinforcing inserts such as an aluminum sheet either encapsulated within zone **26** or laminated between two plastic sheets which are fusible to zone **12** to provide the tensile yield and break strengths specified above.

Another suitable material for board member **10** may be polysulfone because it, too, has unusually excellent physical properties and is available as a transparent material. The polysulfones, in general, have a specific gravity of 1.24, a heat deflection temperature of 345° F, a continuous resistance to heat of between 300° and 345° F, a tensile modulus of 3.6×10^5 psi, a compressive strength of about 13,900 psi, and a flexule strength of about 15,400 psi. Polysulfone where used, can be employed for the upper zone or window **12** and/or as zone **26**, and in the latter instance may be opaque.

Whatever material is used, it must be provided as a sheet having a thickness to provide the tensile yield and break strengths specified above.

When polycarbonates or polysulfones are employed in the construction of the board member of the ballistic clipboard of this invention, there should be included in the resin ultra violet absorbants and the like to preclude yellowing of transparent zones with time.

While a wide variety of constructions for ballistic shield board member **10** may be employed, economically it has been found to be more expeditious to use a continuous sheet of a polycarbonate having the properties set forth above.

While tensile yield and tensile break properties are critical to provide maximum protection for the police officer, other fundamental properties of the resin are also important. Elongation or shrinkage also, for instance, are important to permit the shield to yield to the force of a striking bullet and absorb energy without inducing stresses to the shield.

Heat deflection and resistance to heat are important to both service life under hot weather conditions as well as functionability to penetration of a bullet since in stopping a bullet heat is generated. In addition, a bullet in spinning will tend to drill through the board creating heat which may tend to melt the plastic.

High heat deflection and resistance to heat are, therefore, important properties to the basic resin used in the construction of the ballistic board to overcome the tendency of a bullet to burn its way through.

With reference now to FIG. **2**, under inclement weather conditions there may be employed an overlaying shield **28** hinged at the top or sides using hinges **29** and **30** mounted on or bound to board member **10** and having eliptical shaped slots **32** which permit protective cover **28** to lay flat against board **10** while protecting the papers carried by clip **14** as a consequence of cutout **34** and be positioned flat against the reverse side of board **10** when flipped over for the purposes of making entries on documents held by clip **14**.

The materials of construction for flap **28** are not critical except that it must be transparent at least in the zone associated with zone **12** of board member **10**.

If fabricated from the same material as the board it may permit reduction in the thickness of the board **10** as flap **28** when against board **10** either in the forward or reverse positions will add its thickness to board **10** to provide the overall thickness required to give the tensile yield and break strengths required.

It may, in the alternative, be a thin sheet of a clear material such as polystyrene or the like which serves no functional purpose other than to protect documents under inclement weather conditions. Its addition, however, provides an extra material to resist impact and penetration of a projectile.

With reference now to FIG. **3,** there may be provided as protection against inclement weather conditions a flexible sheet **34** hinged to channel **36** which may be slipped over the edge of board **10** at the junction of the clip with the board to protect papers underneath the clip.

A convenient material which may be employed in construction of sheet **34** and/or hinge **36** is polypropylene since it will form a polypropylene film attached by a notched hinge to channel **34.** When secured to board **10** by the friction provided by channel **36** the thin film of polypropylene may be readily lifted and rotated around to the rear side of the board.

In use the ballistic clipboard of this invention serves the conventional purpose of holding papers a peace officer normally carries when approaching a suspect. In addition, it provides because of its physical properties and dimensions serves as a shield to protect the vital organs of the peace officer. Spontaneously upon the peace officer observing a potentially dangerous condition he will, holding the board, crouch and use the board to shield him while utilizing the transparent portion of the board as a zone for observing the conditions ahead, take whatever action he may consider necessary to meet the conditions which includes the possibility of drawing his own revolver.

In this connection the handle provided in a preferred construction is most useful, since the board may be held in one hand. Holding it in one hand for a person of average strength will permit the board to withstand the blow of a projectile, while permitting the other hand to be used by the peace officer when drawing his revolver.

As previously indicated, the ballistic clipboard should be dimensioned to provide maximum protection for the vital organs.

We have found that optimum dimensions are provided by a board having a width of about 12 inches and a length of about 18 inches with the visual zone above clip **14** being between about 5 and about 6 inches.

A visual zone of this magnitude will provide adequate to protect the forehead of an officer of average build without precluding his ability to observe conditions before him.

The balance of the dimensions give good protection to the vital organs of the chest and even greater protection when the officer is in a crouched position holding the board in front of him as a shield.

As indicated where a handle is provided it permits the officer to hold the board as a shield while freeing his other hand to take whatever measures will be required for future action on his part.

The handle also provides another important feature to the ballistic clipboard. Held in one hand, it can be held as a weapon because of its size and weight and may supplant the need of a nightstick. Again, since the clipboard is the most readily available object normally in the hands of a peace officer during an investigatory operation, it can be used offensively almost spontaneously without the loss of time required to draw a pistol or dislodge a nightstick from a belt.

What is claimed is:

1. A ballistic clip board which comprises:

a. a board member having a tensile yield strength of at least 9,000 psi and a tensile break strength of at least 8,000 psi;

b. clip means adapted for holding papers, said clip means positioned within the periphery of said board member and below the upper edge of said board member and to at least provide a transparent zone between said clip means and said upper edge of said board member and providing a protective area sufficient to shield the forehead of an average size man while providing a zone of observation between said clip and the upper edge of said board member, said board member having a length and width sufficient to protect the vital organs of an average man when in a crouched position, said board member being provided with a handle formed of an aperture and contained within the periphery of said board member, adjacent to and along a length thereof, said handle positioned between said clip means and said lower edge of said board member.

2. A ballistic clipboard as claimed in claim **1** in which the clip is positioned from about 5 to about 6 inches below the upper edge of said board member and said board member having a width of about 12 inches and a length of about 18 inches.

3. A ballistic clipboard as claimed in claim **2** in which said board member is constructed of virgin polycarbonate and has a thickness of about 0.375 inch.

4. A ballistic clipboard as claimed in claim **1** in which the clip means is reversible.

5. A ballistic clipboard as claimed in claim **1** in which the entire board member is transparent.

6. A ballistic clipboard as claimed in claim **5** in which said board member is constructed of virgin polycarbonate and has a thickness of about 0.375 inch.

7. A ballistic clipboard as claimed in claim **1** which includes shield means to papers held by said clip means during inclement weather conditions, said shield means adapted to pivot from the front face of said board member to the rear face thereof.

8. A ballistic clipboard as claimed in claim **7** in which the shield means contacts the area between said upper edge board member and said clip means as is transparent at least in that area.

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