

[54] **UNIVERSAL SPINE AND SPLINTING BOARD**

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[52] U.S. Cl. 5/82

[51] Int. Cl. A61g 1/00, A47c 17/64

[58] Field of Search.....5/81, 82, 317

[56] **References Cited**

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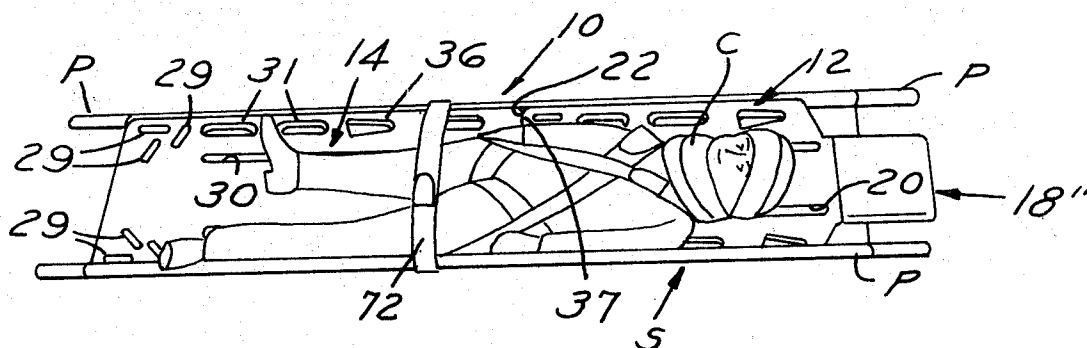
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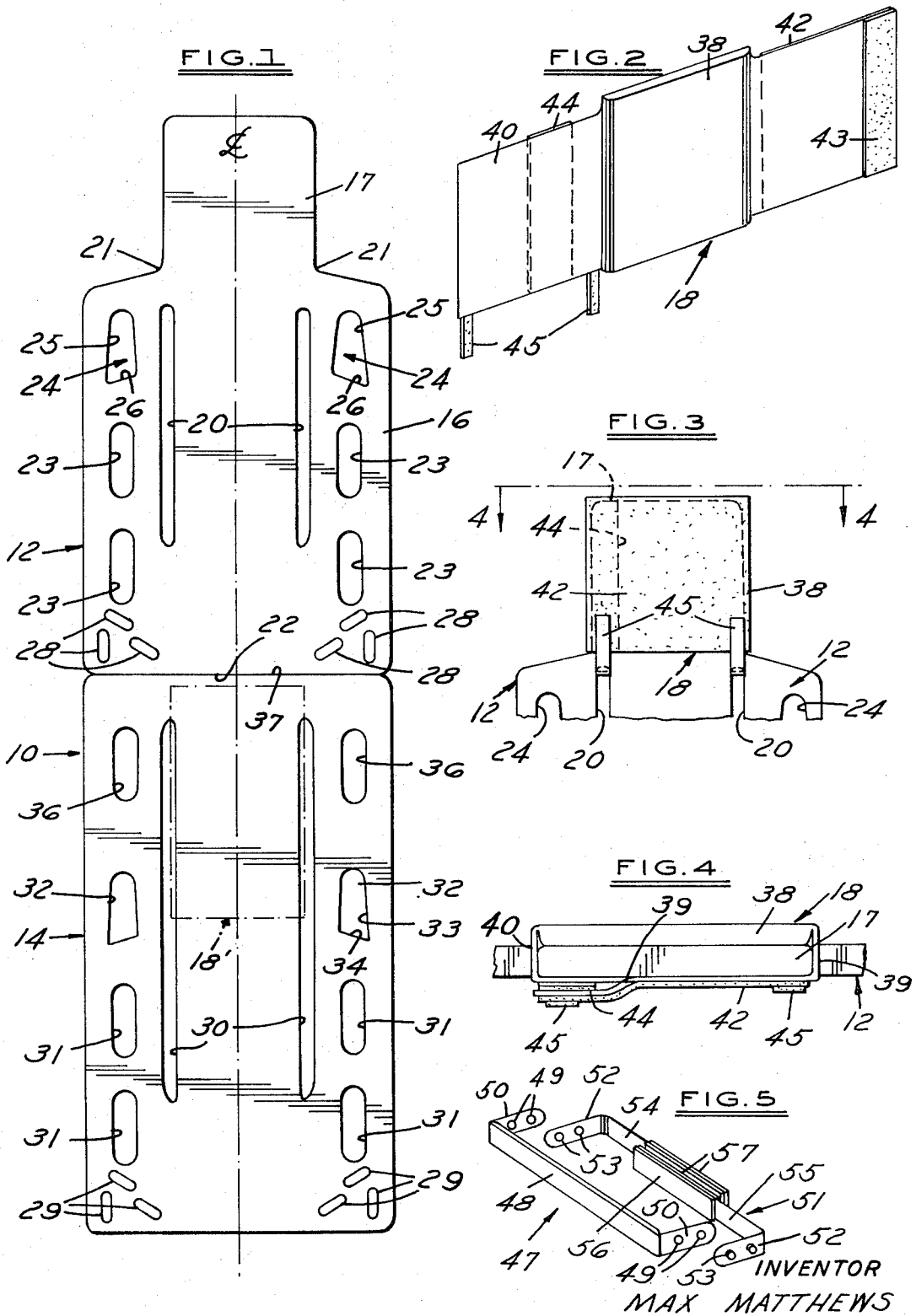
[57] **ABSTRACT**

A board structure is constituted by a pair of separate rigid, generally rectangular panels, each of which may

be used in various ways to the exclusion of the other, or which may be used in combination as a full flat splint length, as coupled rigidly by a stretcher's poles of the like. Each panel has a pair of elongated parallel and laterally spaced slots extending longitudinally within side and end margins thereof, the slots being of a width sufficient to receive torso, forehead and/or chin immobilizing strap-like devices by which the patient is restrained prior to, during and after transportation from the scene of an injury. Each panel or board member is also provided, laterally outwardly of the said slots thereof with a series of openings, generally oblong in the direction of the panel's length, which may serve as hand holes and are also adapted to receive patient restraining and supporting strap means of one sort or another. Clusters of small belt-receiving slots adjacent corresponding lower corners of the boards complete the pattern of aperturing of the latter. The use, in association with the boards, of cushioned forehead and chin restraining strap devices having hook and loop-type pressure fasteners and supplemental adjustable buckle or snap fastener means is contemplated.

20 Claims, 9 Drawing Figures





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FIG. 6

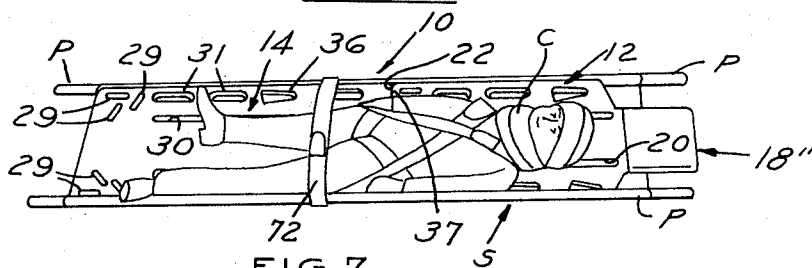


FIG. 7

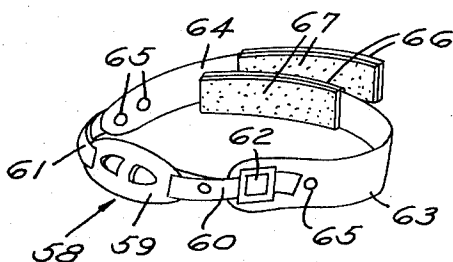


FIG. 9

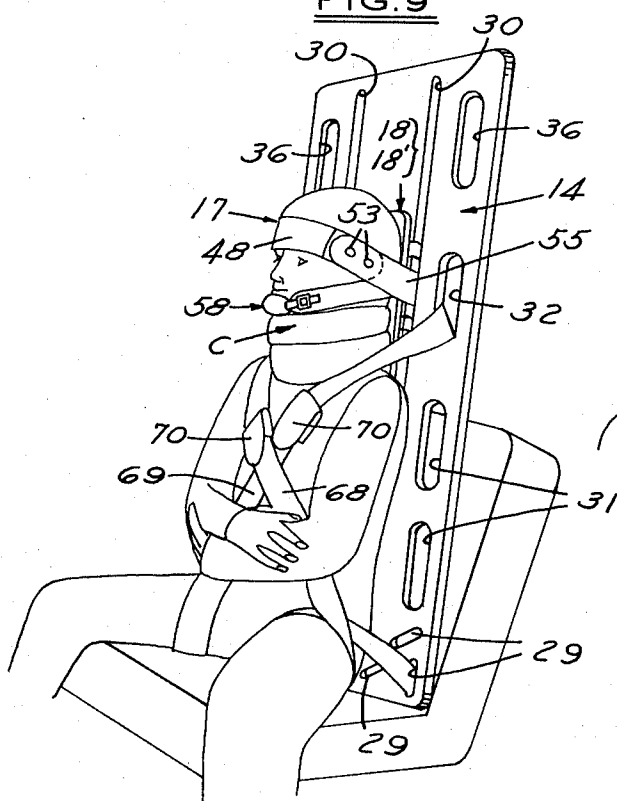
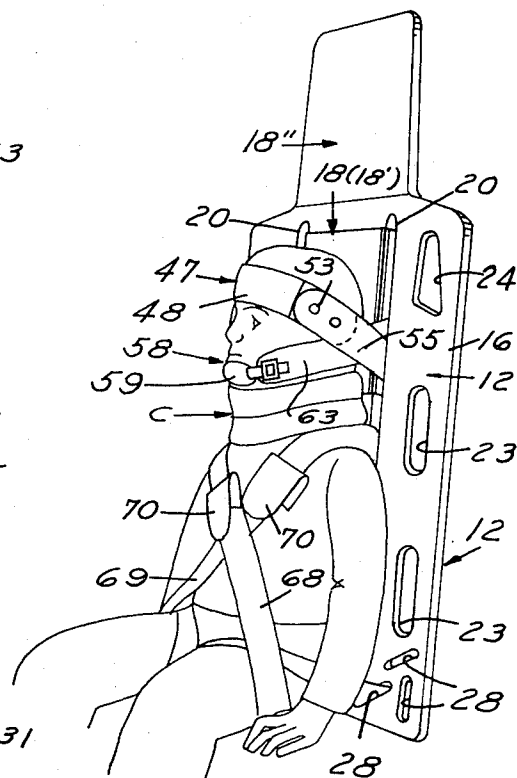


FIG. 8



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UNIVERSAL SPINE AND SPLINTING BOARD

BACKGROUND OF THE INVENTION

1. Field of the Invention

The spine and splinting board components are primarily intended for use, individually or simultaneously in combination, by ambulance personnel in the immobilizing of an injured patient at the site of occurrence of the injury, commonly as the result of an automobile collision. More specifically, the board structure of the invention has been designed to comply with American College of Surgeons recommendations, and in some cases state and municipal requirements, particularly in regard to minimum overall length for handling possible spinal injuries; while still being dimensioned for convenience in storage, and speed and safety in use in a limited, often awkward space.

2. Description of the Prior Art

A preliminary search reveals the U.S. Pat. to Warden, No. 2,141,100 of Dec. 20, 1938, Phillips, No. 3,469,268 of Sept. 30, 1969 and Hughes, No. 2,511,061 of June 13, 1960. None of these references show or suggest the scheme of slotting or otherwise aperturing related types of board components as referred to in the abstract.

SUMMARY OF THE INVENTION

The improved two-part board structure of the invention affords optionally usable pieces of equipment for use by hospital and/or ambulance attendants at an emergency or accident site in the splinting and immobilizing of an injured patient against possible further cervical or spinal trauma during his removal and transportation to a treatment facility. As is typically the case in the State of Michigan, certain procedures relating to, and equipment necessary for, patient preparation and care in all ambulances have been enacted into law, consonant with specifications prescribed by A.C.S., as noted above. Among them, the presence in the vehicle of a spine and splinting board of an overall length no less than seventy two inches is required; and one object of the present invention is to afford a composite two-panel board structure which aggregates this length when its panels are placed end-to-end and rigidly coupled in this relationship, as by the poles of a conventional stretcher.

Yet the use of such an extended length is in many if not most cases not dictated, as in the case of a neck or head injury; in fact it is a decided drawback in instances in which it is necessary to initially remove the patient from a confined and/or damaged space. Hence, the invention affords optionally available, half length board panels which may be used safely and quickly in the limited quarters, in several different arrangements of the selected panel member in relation to the patient and supplemental confining strap means, as dictated by the patient's age or size, the nature of the injury, etc.

It is a more specific object of the invention to provide a pair of generally similar board or panel components which, whether coupled end-to-end for a full 72 inch length leg, torso and head support, or used individually, have generally similar improved internal and corner slot formations, plus side hand holes and the like, for receiving optionally various types of immobilizing, cushioning and other strap-type devices, as shown herein or known to the art, and ordinarily also specified as parts of required ambulance equipment.

Regardless of which board panel is employed, or both, a wide range of adjustability as to the kind and manner of application of such strapping means is a feature of general improvement in the invention.

In this connection, reference is again made to elongated parallel and laterally spaced pairs of slots, certain belt-receiving corner slots and other end-wise spaced strap or band-receiving openings, all common to both boards. The board components are inexpensively template-formed of a suitable grade and gauge of plyboard or other plastic or equivalent materials.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view showing the two spine and splinting board components as operatively abutted in end-to-end relation to one another, stretcher type means for coupling the board members together in this coplanar position being omitted, as well as various strap-type confining devices normally used with the board structure;

FIG. 2 is a perspective view of a typical head cushion device applicable in one way or another to a board panel of FIG. 1, this device being shown in a spread condition prior to application to the panel;

FIG. 3 is a fragmentary view of the upper splinting panel as equipped with the cushion device of FIG. 3;

FIG. 4 is a fragmentary end view, as from the line 4-4 of FIG. 3, of the assembled cushioning and panel members, the former being snugly held to a head extension of the panel member by releasable, hook and loop-type pressure fastening means;

FIG. 5 is a perspective view showing component parts of a forehead restraint strap device, as equipped pursuant to the invention with similar pressure fastener provisions, as well as adjustable snap fasteners;

FIG. 6 is a top perspective view illustrating the combined and full length spine and splinting board structure as applied to a patient in the field, with a stretcher coupling the combined panels;

FIG. 7 is a perspective view of an improved chin restraint strap device intended for use in association with a panel of the board structure, being equipped with adjustable belt and buckle and hook and loop-type fastener means for the purpose;

FIG. 8 is a fragmentary perspective view showing a typical manner of using an upper panel of the structure in the splinting of a patient of small stature in a sitting posture;

FIG. 9 is a view similar to FIG. 8, illustrating the use of the lower panel member in treating a patient of somewhat greater height, also in a sitting position.

DESCRIPTION OF A PREFERRED EMBODIMENT

The improved spine and splinting board structure of the invention, as generally designated 10 in FIG. 1, consists of a pair of generally rectangular, upper and lower board panels 12, 14, respectively, which are each, for example, of 16 inches maximum width (horizontally in FIG. 1) and 36 inches length, so that, with the boards 12, 14 abutted endwise as shown in FIG. 1, the two-part board unit 10 aggregates 72 inches in length; it thereby complying with a recommended requirement of the American College of Surgeons in this respect, as well as, typically, the law of Michigan.

Board members 12, 14 may be fabricated of any suitably rigid material, for example, plyboard or press

board, or of a conventional sheet plastic composition of fiber glass, or a light weight metal; and a typical plyboard panel member 12 or 14 will have a maximum thickness of, say, five-eighths inch. In regard to selection of materials, the factors of rigidity, low cost, lightness in weight, etc. will control the choice. Plyboard is well suited in these respects, and may be template-formed in a good mass rate at relatively low cost.

As illustrated in FIG. 1, the upper spine and splinting panel member 12 has a generally rectangular, full width body of torso portion 16, from which a reduced width head portion 17, also generally rectangle-sided, projects integrally; and the internal and external corners of this panel member 12 are all appropriately rounded. This is also the case in regard to the lower board or panel member 14, which is of full 16 inch width throughout its 36 inch length.

The reduced width head extension 17 of the upper board 12 is adapted, in one mode of use of the board 12 typically depicted in FIGS. 3 and 4, to receive a foam rubber-padded head cushion unit, generally designated 18 and later described in detail, illustrated in FIG. 2 in a flat spread condition prior to application to board extension 17, as illustrated in dot-dash line in FIG. 1. An only slightly modified version 18' of the head cushion may be differently applied to one or the other of the board members of spine and splinting structure 10, i.e., within the margins of the panel per FIGS. 8 and 9.

The panel components 12, 14 are individually shaped symmetrically, both externally and as to certain internal aperturing thereof to be described, about a longitudinal, end-to-end center line. Such aperturing of upper panel 12 pursuant to the invention comprises a pair of elongated parallel belt-receiving slots 20 laterally spaced substantially and equidistantly from said center line. They are typically about 13-15 inches in length, are rounded at their opposite ends, and are sufficiently in-set, in relation to rounded shoulder portions 21 of the board which adjoin the head extension 17, for adequate strength when the member 12 is lifted in support of the patient.

The upper board 12 is formed equidistantly outwardly of the respective belt slots 20 and upwardly of its lower transverse edge 22 to provide longitudinally spaced pairs of oblong hand-holes 23, all rounded at their ends; and yet another pair of holes 24 are spaced upwardly of these pairs. The holes 24 (which may also serve as hand-holes) are formed with divergent sides 24 and an outwardly angled or flared bottom wall 26, thus constituting an outline best accommodating conventional buckle-bearing body restraining belts of considerable length, the use of which is depicted in FIGS. 6, 8 and 9.

Finally, the upper board 12 is provided in the corners thereof adjacent its lower edge with clusters of three like, relatively short and narrow belt slots 28, the angular positioning and relative spacing of which may well vary in different board constructions. However, in any arrangement or orientation they afford a choice of round-ended openings through which a thigh encircling and torso restraining belt may be passed in convenient optional relationships to the patient, as best appears in FIGS. 8 and 9.

The lower panel member 14 of the structure 10 is, as shown in FIG. 1, provided with sets of belt-receiving,

oblong corner slots 29, shown as arranged identically to the corner slots 28 of board 12. Board 14 is also provided with a pair of parallel and laterally spaced, elongated belt-receiving slots 30; these are related to board 14 similarly to, but are of substantially greater length than, the corresponding slots 20 of board 12. That is, the slots 30 will typically be about 24 inches in length. Slots 20 and 30 are all about three-quarter inch in width.

Also like board 12, the board 14 is formed to provide pairs of elongated hand-holes 31 similar in shape and spacing to the hand-holes 23, and correspondingly related to the clusters of corner belt slots 28, 29. Special divergent and flare-sided belt slots 32, as defined by side walls 33 and an angular bottom edge 34, are longitudinally spaced above the adjacent pair of hand-holes 33; and the aperture formations of the lower spine and splinting board 14 are completed by a pair of hand-holes 36 spaced substantially inwardly and beneath the upper edge 37 of board 14.

FIG. 1 illustrates in dotted line a cushioned head rest 18', of the general type shown in FIGS. 2, 3 and 4, as encircling a central portion of the board 14 between its belt slots 30, this being an option to the positioning of the head cushion shown in FIG. 3, or a way of storing the part between periods of use.

In regard to various types of adjunct cushioning and restraining units intended for use in association with the board component 12 and/or the board component 14, references may first be had to FIGS. 2, 3 and 4, in the first of which the cushioning unit or device 18 appears in an open, spread condition prior to use. It comprises a center head rest part 38 of rectangular outline in the form of a closed end casing internally cushioned firmly by foam rubber. Reinforced lateral rectangular, sheet-like flap members 39, 40 are flexibly connected to the sides of panel 38. The flap 39 has stitched to one side thereof a full-area panel 42 (or in the alternative several strip-like panels) of the known Velcro hook and loop-type pressure fastening material, for example the loop-presenting fabric; and the opposite side of the same flap has similarly stitched thereto a vertically elongated width 43 of the Velcro hook material. The other flap member 40 has a strip 44 of the loop material stitched to a side thereof, which strip is rearwardly exposed for interlocking engagement by and beneath the Velcro hook strip 43 when the flap member 40 is swung 180° backward onto the rear of the board extension 17, thus rearwardly exposing the full area of the fastener loop component 42 at the rear of the unit 18. These operations are performed as the head cushion unit 18 is wrapped about the head extension 17 of upper board 16.

However, the invention also contemplates the pre-stitching of an equivalent cushioned unit, specially designated 18 inches in FIGS. 6 and 8, in the form of an inverted bag-like unit closed at its top as such and simply slipped downwardly in snugly telescoped fashion over the extension 17. The other alternative form 18' of the head cushion, as previously referred to, is desirably of greater length than the extension-engaging units 18 and 18', and may be fastened to one or the other of the boards 12, 14, as shown in dot-dash line in FIG. 1, by passing its side flaps through the slots 20 or 30, then securing the flaps together behind the board at their releasable hook and loop fastening areas.

As illustrated in FIGS. 2, 3 and 4, the flap part 40 of cushion unit 18 has a pair of Velcro-type hook strips 45 stitched to the head-cushioning side thereof adjacent the latter's bottom margin; and with the panels 39, 40 wrapped and secured about board head extension 17, the straps 45 are brought downward and rearwardly through the upper ends of the board slots 20, then pressed firmly against rear-exposed loop portions of the fastener fabric 42, thus to hold unit 18 firmly against upward displacement from upper board 12. Similar strap means 45 are contemplated for the alternative cushion unit 18'' (FIGS. 6 and 8).

FIG. 5 of the drawings illustrates a forehead restraining strap unit, generally designated by the reference numeral 47. This device comprises a central and tubular front strap length 48 appropriately padded internally along its length, which strap has a pair of snap fastener elements 49 projecting from fastener flaps 50 at each end thereof. A rear two-piece strap member 51 of the strap unit 47 has end flaps 52, each of which bears a pair of snap fastener elements 53 matingly engageable with the elements 49 of the front strap flaps 50. The compound strap member 51 is constituted by a pair of like strap lengths 54, 55 from which the respective flaps 52 extend; and each of the strap components 54, 55 is equipped on opposite front and rear sides thereof with overlappable lengths of the interhooking Velcro loop and hook fabrics, as indicated at 56 and 57, respectively. With the cushioned length 48 of device 47 applied across the patient's forehead, as illustrated typically in FIGS. 8 and 9, and with the rear strap component 51 adjustably applied to the front component 58 by a snap connection at either one or both of the pairs of snap members 53, 54, the rear strap components 54, 55 are brought back through the elongated slots 20 of upper board 12 or the slots 30 of the lower board 14, then tensioned to bring the patient's head firmly against the previously applied head cushioning unit 18', and pressure-secured together at the overlapped Velcro areas 55, 56. The restraint device 47 is similarly applied, if indicated, about the head extension 17 of board 12.

FIG. 7 illustrates yet another type of restraining unit, generally designated 58, which may be used in association with either of the boards 12, 14. Device 58 comprises a molded plastic chin piece 59, to the opposite ends of which loops of belt or strap lengths 60, 61 are anchored, as by riveting. Each such element is adjustable as to its length through the agency of a buckle connection 62. A further enlarged range of adjustment, as may well be needed, is made possible in applying this buckle connection to a pair of rear strap members 63, 64 of device 58, in the form of two spaced snap fastener components 65 at a forward portion of each of the strap parts 63, 64, these snap elements being selectively engaged by a co-acting snap means (not shown) on the buckle fastener member 62. Velcro hook and loop strips 66, 67 are stitched on opposite sides of the strap members 63, 64 adjacent the free ends thereof; and the manner of applying the chin strap device is the same as for the forehead strap device 47 of FIG. 5, as depicted in FIGS. 6, 8 and 9.

Those figures illustrate typical uses and the versatility of the board structure 10 in the treatment of a patient subject to a neck or head injury. Thus, with a conventional foam-padded cervical collar or neck roll C applied to a seated patient of average stature, FIG. 8

shows him immobilized at his head and torso using only a pre-placed upper board member 12 of the structure 10. In this arrangement, two of the usual 8 or 9 foot length reinforced restraining or splinting belts 68, 69, are brought over the patient's shoulders and through the slots 20, then crossed behind board 12 and passed forwardly through whichever of the three lower corner belt slots 28 offers the most convenience. The belts are then led over and about the thigh, as close to the groin as possible, crossed over the patient's chest, where they are taken up snugly at their releasable clip fasteners 70 to exert spinal immobilization.

A head cushioning unit 18 or 18' is shown in FIG. 8 as being wrapped through the slots 20 adjacent to the top of the latter, being taken up and pressure fastener-secured at the rear of the board, as described above. Forehead and chin restraining devices 47, 58, respectively, also extend back through the slots 20, being releasably pressed and secured together, after adjustment of their several snap and buckle means, at the rear of the board 12, all in the manner described above in connection with FIGS. 5 and 7.

FIG. 9 illustrates the use of only the lower board 14 in the immobilization of a sitting patient of considerably lesser height than in the case of FIG. 8. In this case forehead and chin restraints are applied as before, and the belt holes 32 receive the belts 68, 69. Again, a selected pair of the corner belt slots 29 receive the straps. Of course, many other options are available in regard to the application of belts 68, 69.

The upper and lower boards 12, 14 are shown in FIG. 6 as used in combination in end-to-end abutment at their respective edges 22, 37 for the treatment and transportation of a fully recumbent patient. The torso confining belts 68, 69 are passed through the upper ends of the slots 30 of the lower board 14, brought about the thighs and through the corresponding pair of slots 20 of the upper board 12. The boards are held in rigid flat, end-to-end relations as supported on the canvas panel of a conventional stretcher S, whose elongated lifting poles P longitudinally span the meeting interface of the boards at 22, 37. A conventional restraining belt 72 surrounds the legs of the patient and the stretcher. Of course any and all of the other belt or strap aperture provisions 23, 24, 28, 29, 31, 32 and 36 are available for use as needed.

What is claimed is:

1. A spine and splinting board for use in the handling of an injured person at the site of an accident, and in lifting, carrying and transporting the injured person to a medical treatment facility, said splinting board comprising an elongated and generally rectangular, rigid panel apertured within the marginal limits thereof to provide a set of generally similar belt receiving openings, including a pair of elongated slots paralleling the panel length and located substantially equidistantly outward of the panel's end-to-end center line, and rows of parallel hand hole-like openings spaced longitudinally from one another, with said rows located substantially equidistantly laterally outward of the respective elongated slots, and strap means for securing the injured person to the panel comprising straps adapted to being passed over the body of the injured person and through the elongated slots and/or through said hand hole-like openings, and under said panel, said straps

being removably mounted on said panel and adapted to be adjustably attached to the body of the injured person, said elongated slots each having a length which is substantially greater than the length of each hand hole-like opening, each elongated slot being adapted to accommodate a plurality of said straps.

2. Spine and splinting board structure for use in the handling of an injured person at the site of an accident, and in lifting, carrying and transporting the injured person to a medical treatment facility, said splinting board structure comprising a pair of separate but generally similar elongated and generally rectangular, rigid panels each apertured within the marginal limits thereof to provide sets of generally similar belt receiving openings, including in each panel a pair of elongated slots paralleling the board length and located substantially equidistantly outward of the panel's end-to-end center line, the elongated slots in one of said panels being longitudinally aligned with the elongated slots in the other of said panels, and rows of parallel hand hole-like openings spaced longitudinally from one another, with said rows located substantially equidistantly laterally outward of the respective slots, and strap means for securing the injured person to the panels comprising straps adapted to being passed over the body of the injured person and through the elongated slots and/or through the hand hole-like openings, and under said panels, said straps being removably mounted on said panels and adapted to be adjustably attached to the body of the injured person, said elongated slots each having a length which is substantially greater than the length of each hand hole-like opening, each elongated slot being adapted to accommodate a plurality of said straps.

3. The board of claim 1, in which one or more further belt receiving slots are provided in the panel adjacent corresponding corners of the latter.

4. The board structure of claim 2, in which one or more further belt receiving slots are provided in each of said panels adjacent corresponding corners of the latter.

5. The board of claim 1, in which one or more further belt receiving slots are provided in the panel adjacent corresponding corners of the latter, said corner slots including at least one angled acutely to the panel center line.

6. The board structure of claim 2, in which said panels, as used in flat-wise coplanar relation in combination with one another have like mated end-to-end abutting edges.

7. The board structure of claim 4, in which said panels, as used in flat-wise coplanar relation in combination with one another have like mated end-to-end abutting edges adjacent said corner slots of one of the panels.

8. The board structure of claim 7, in which said abutting edges are rectilinear, being adjacent said corner slots of one of the panels and remote from the corner slots of the other panel.

9. The board of claim 1, as used in combination with a patient head rest device engaged through said first named slots of the panel.

10. The board of claim 3, as used in combination with a patient head rest device engaged through said

first named slots of the panel.

11. The board of claim 5, as used in combination with a patient head rest device engaged through said first named slots of the panel.

12. A spine and splinting board for use in the handling of an injured person at the site of an accident, and in lifting, carrying and transporting the injured person to a treatment facility, said splinting board comprising an elongated rigid panel including a pair of elongated slots paralleling the panel length and located substantially equidistantly outwardly of the panel's end-to-end center line, and a movable cushioning device on one side of said panel including portions extending through said slots to the other side of said panel for holding the cushioning device on said panel, said slots each having a length substantially greater than the height of said cushioning device, said cushioning device being adapted to be moved lengthwise in said slots to accommodate the injured person.

13. The spine and splinting board defined in claim 12 including rows of parallel hand hole-like openings spaced longitudinally from one another, with said rows located equidistantly laterally outward of said elongated slots.

14. The spine and splinting board defined in claim 13 including strap means for securing the injured person to the panel comprising straps adapted to being passed over the body of the injured person and through the elongated slots and/or through said hand hole-like openings, and under said panel, said straps being removably mounted on said panel and adapted to be adjustably attached to the body of the injured person, said elongated slots each having a length which is substantially greater than the length of each hand hole-like opening, each elongated slot being adapted to accommodate a plurality of said straps.

15. The spine and splinting board defined in claim 12 wherein said cushioning device includes a yieldable pad of foam rubber.

16. The spine and splinting board defined in claim 12 wherein said cushioning device includes means forming a patient head rest unit upon which the head of the injured person is adapted to rest.

17. The spine and splinting board defined in claim 14 wherein said straps include ends which are releasably engaged with one another behind the patient and said panel by readily separable means.

18. The spine and splinting board defined in claim 17 wherein said separable means includes releasably snap type and pressure adhered hook and loop type components.

19. The spine and splinting board defined in claim 12 wherein said cushioning device includes a center part made from yieldable material engageable with said one side of the panel, with a pair of flap members connected to opposite sides of said center part, said flap members extending through said elongated slots and releasably engageable with one another on said other side of the panel by readily separable means.

20. The spine and splinting board defined in claim 19 wherein said separable means includes releasably snap type and pressure adhered hook and loop type components.

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