United States Patent [19]

Reed et al.

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[45] **July 10, 1973**

[54] **PERSONNEL SHELTER**

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[22] Filed: **Jan. 6, 1971**

[21] Appl. No.: **104,449**

[63] Continuation-in-part of Ser. No. 80,449, Oct. 13, 1970, abandoned.

[52] **U.S. Cl.** **219/217,** 219/213

[51] **Int. Cl.** **H05b 1/00**

[58] **Field of Search** 219/217, 213; 128/376, 377; 297/180

[56] **References Cited**

UNITED STATES PATENTS

2,544,506	3/1951	Kronhaus	297/180

FOREIGN PATENTS OR APPLICATIONS

312,825	6/1929	Great Britain	219/217
1,244,292	9/1960	France	297/180

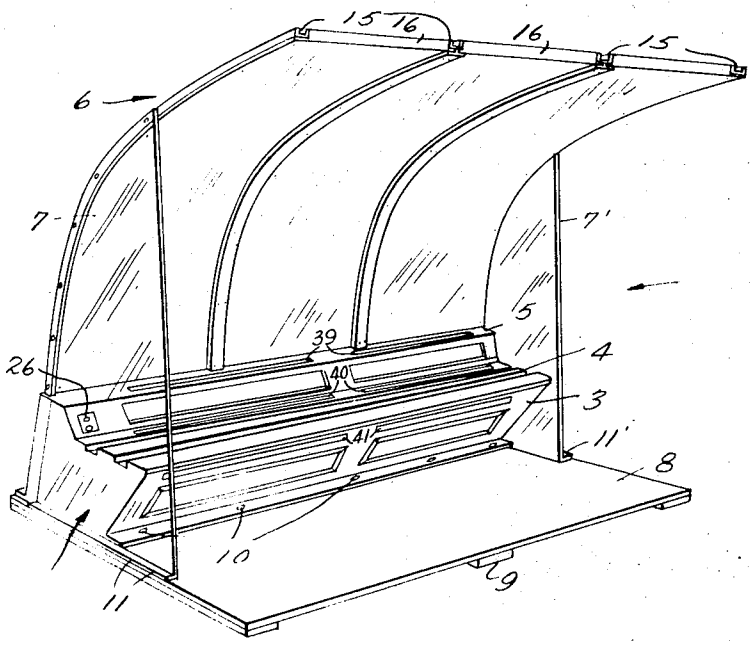
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[57] **ABSTRACT**

A personnel shelter is defined by a canopy and end walls of transparent lightweight flexible material which are removably attached to a bench. Heating and cooling, and air circulating devices are incorporated with the personnel shelter for conditioning the air within the shelter.

8 Claims, 7 Drawing Figures



Patented July 10, 1973 3,745,305

4 Sheets-Sheet 1

Fig. 1.

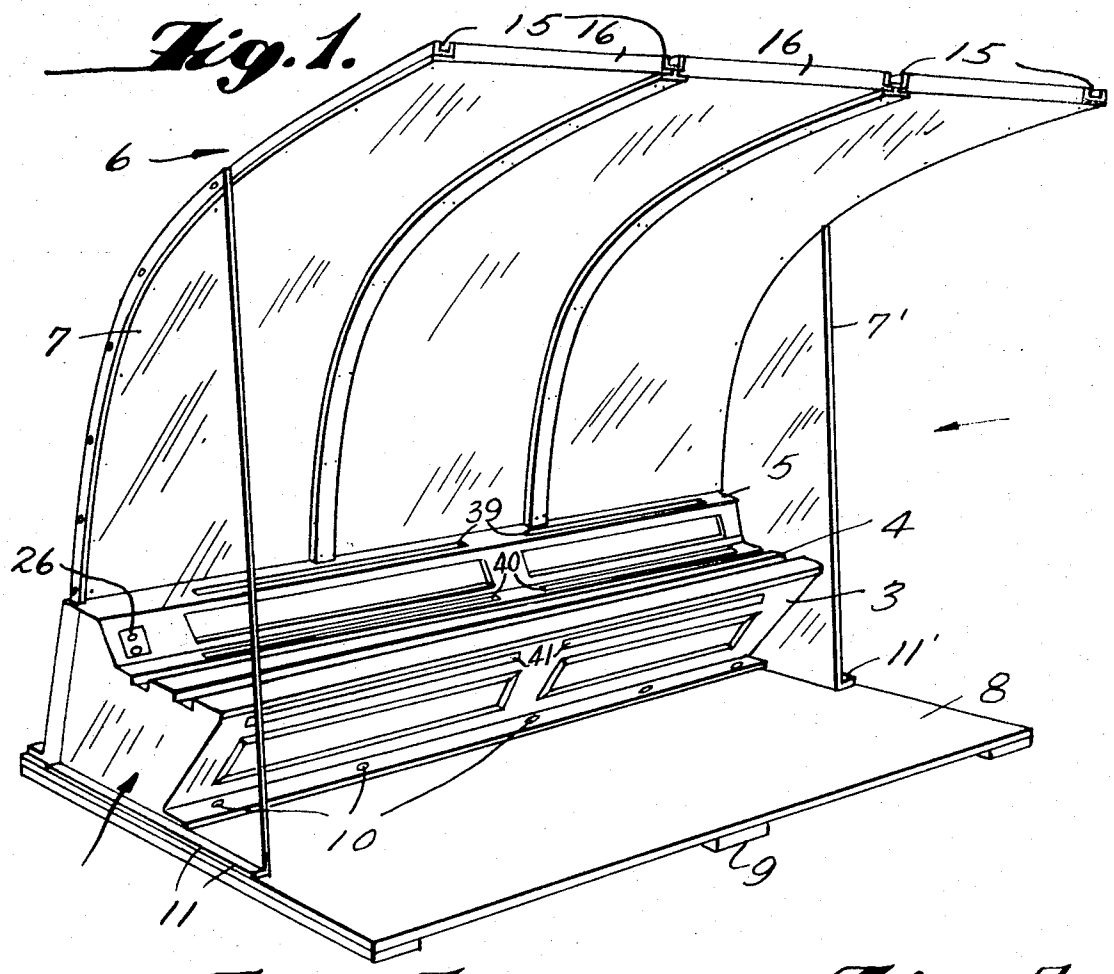


Fig. 5.

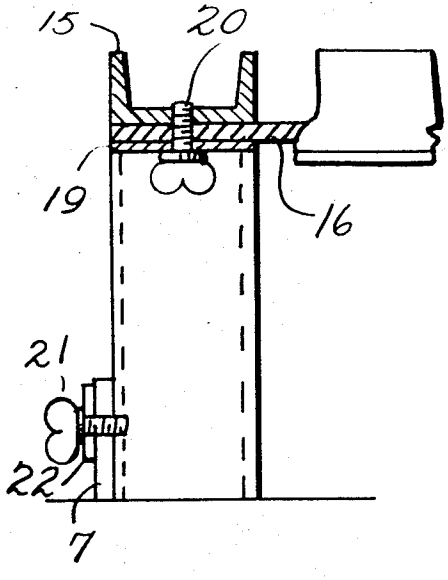
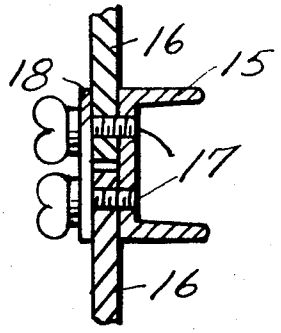


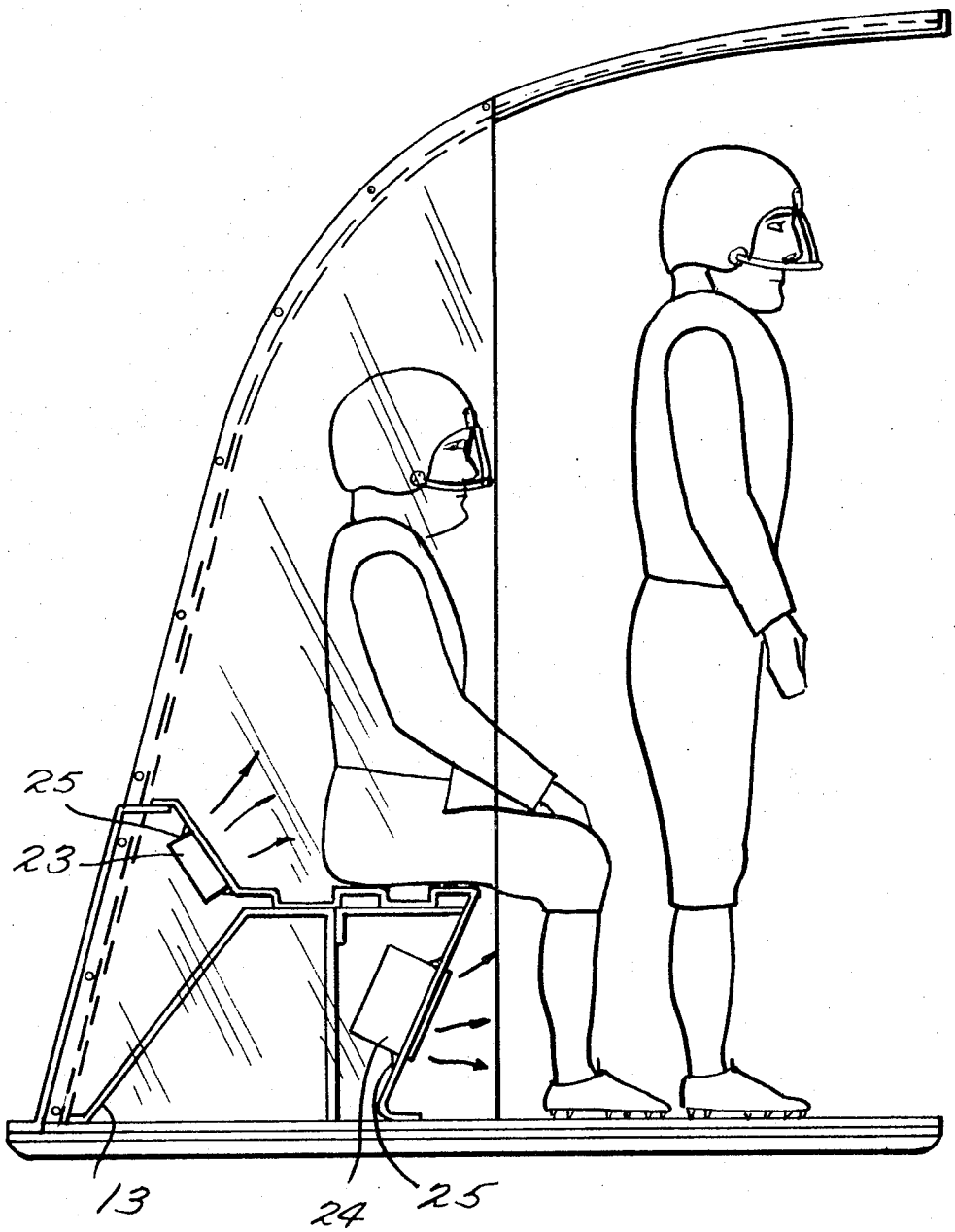
Fig. 4.



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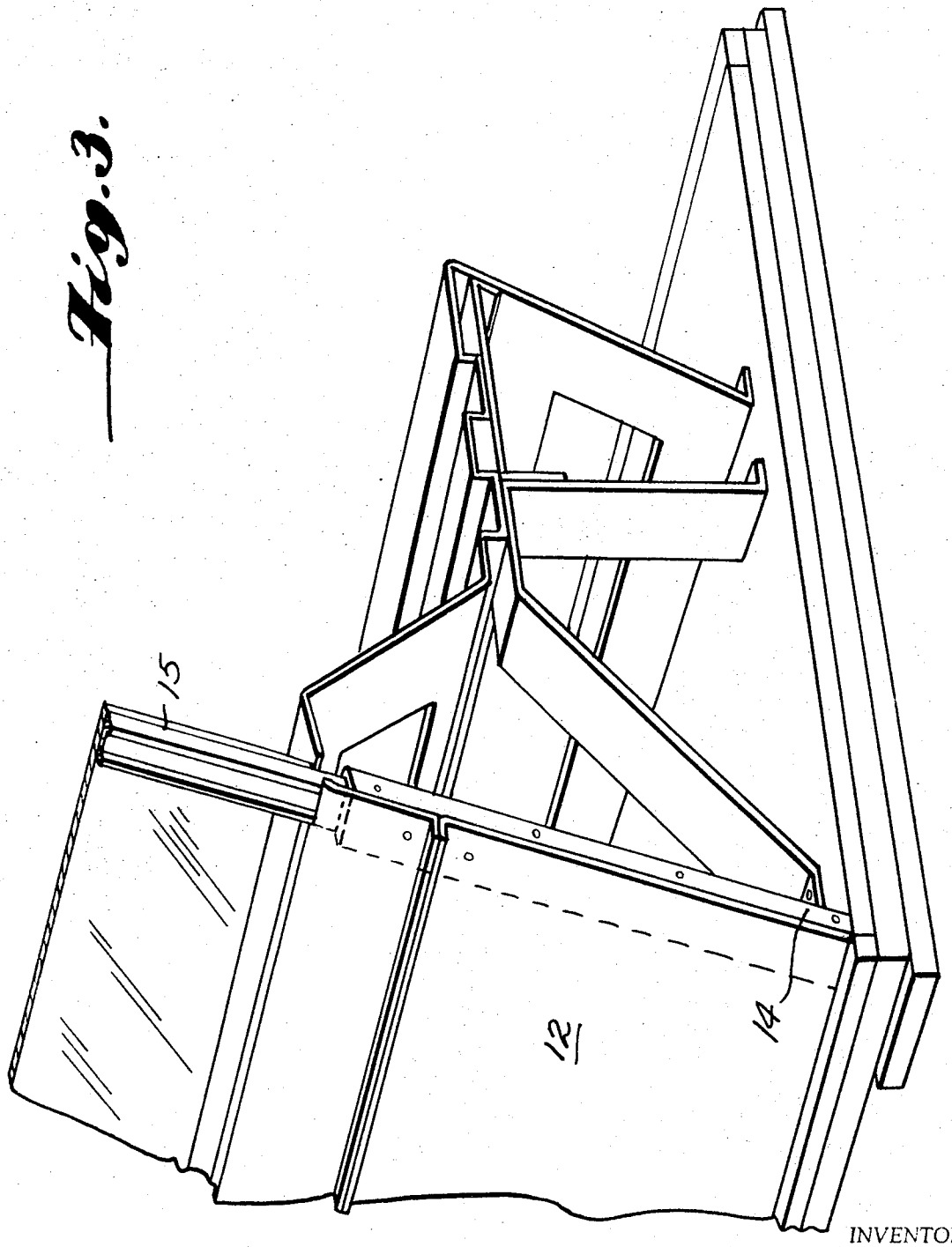
Fig. 2.



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Fig. 3.



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Fig. 6.

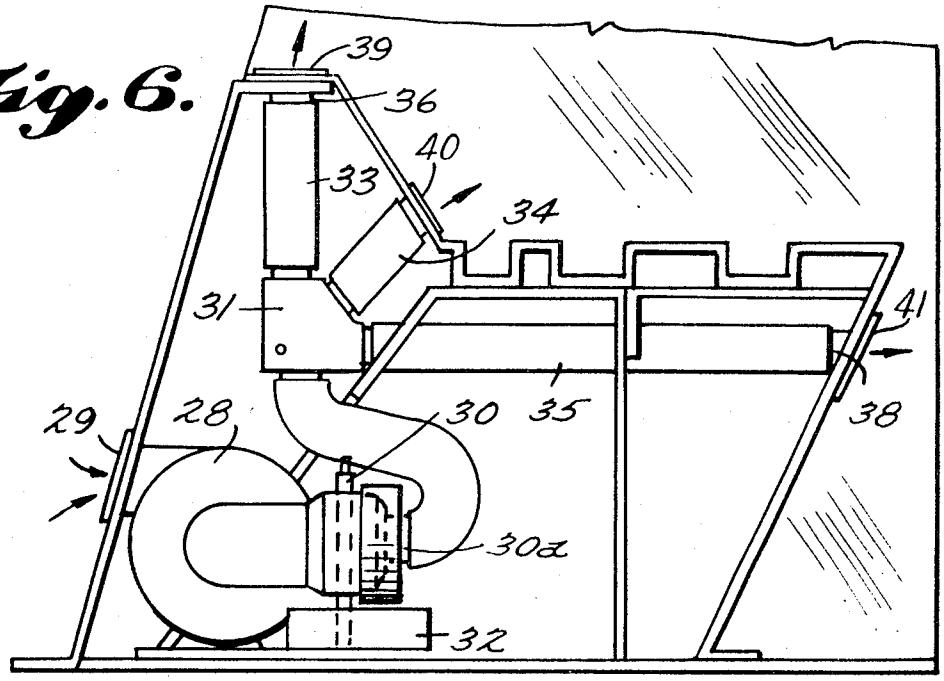
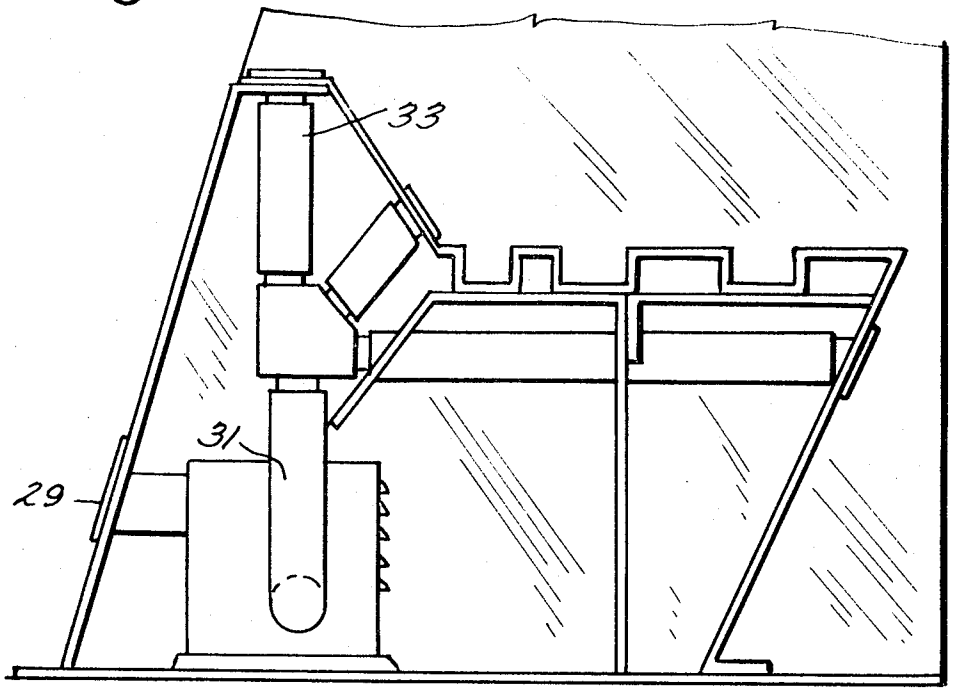


Fig. 7.



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PERSONNEL SHELTER

This is a continuation-in-part of application Ser. No. 80,449 filed Oct. 13, 1970 now abandoned.

BACKGROUND OF THE INVENTION

This invention pertains to personnel shelters and specifically to shelters designed to offer a maximum protection against the elements while maintaining a maximum visual contact with the environment.

Protection against hot, cold and inclement weather has been one of mankind's most constant pursuits throughout history. Nevertheless, in certain areas this battle against the elements has yet to be won. For instance football players ordinarily sit on open benches completely exposed to elements which imposes great hardship upon the players during very hot, cold or inclement weather. Furthermore, besides the primary discomfort involved in being cold and/or wet there is also an increased danger of injury when unthawed muscles are plunged into the heat of competitive sports or when overheated athletes cannot be properly cooled following strenuous exercise.

There have, of course, been previous attempts to shelter football players from the elements. The method of providing dugouts under the stands has not proved convenient because the extra players on the bench need to be located nearer the field for quick substitution. For the same reason the shelter should be so constructed that large groups of people can quickly enter and leave the sheltered area and thus completely enclosed shelters, even if located adjacent to the playing field are impractical.

For the foregoing reasons the most promising shelter for football players developed by the prior art was a canopy which covers the bench area and defines a sheltered area which opens upon the football field. Even this solution, however, was disadvantageous from both the player's and the fan's point of view. While the canopy provided some shelter from the elements it did not contain any heating or cooling means and since it was open it provided no protection against the cold or the extreme heat produced by an artificial turf. In addition, the canopies adopted by the prior art interfered with the fan's view of the playing field and kept him from observing his favorite players and coach while they sat upon the bench. In addition, the prior art shelters were disadvantageous from the point of view of the playing field maintenance crew since they had to be assembled piece-by-piece at the bench site.

SUMMARY OF THE INVENTION

It is therefore one object of this invention to provide a personnel shelter with a transparent canopy. It is another object of this invention to provide personnel shelter which has heating, and cooling means attached thereto. It is yet another object of this invention to provide a personnel shelter which can be moved as a unit or completely disassembled. It is a further object of this invention to provide a personnel shelter including a canopy cooler and heater both of which are removably attached to a bench so that the bench can function as an open bench during fine weather.

The above and other objects will be accomplished by the applicant's invention which, simply stated, comprises a personnel shelter having a transparent canopy removably attached to a bench and curving above the bench to provide, in conjunction with end walls, a sheltered area about the bench and heaters and cooling means removably attached to the bench for warming, or cooling, especially the feet and lower back portions of people sitting upon the bench.

While most of the foregoing comments were directed to a shelter specifically designed to protect football players from the elements, it should be obvious that a shelter for this purpose would also have great utility in other areas. For instance, a shelter which would overcome the difficulties mentioned above could provide temporary relief from the elements for construction workers, commuters, skiers or anyone else who has been induced by business or pleasure to spend time outdoors during very hot, cold and/or inclement weather. In particular, a shelter in accord with applicant's invention would be a boon to those who commute during dark hours since they could see through the shelter's canopy and thus spot suspicious persons lurking thereabout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a personnel shelter according to applicant's invention;

FIG. 2 is a side view of the personnel shelter shown in FIG. 1 showing particularly the placement of the heaters;

FIG. 3 is a partial view of the end of the personnel shelter from the perspective of one standing behind the bench;

FIGS. 4 and 5 are details of FIG. 1 showing how the canopy sections are fastened to the channels;

FIG. 6 is a side view of the personnel shelter similar to FIG. 2 showing particularly the placement of the blower means; and

FIG. 7 is a side view of the personnel shelter similar to FIG. 2 showing particularly placement of the mechanical cooling means.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, reference numeral 1 indicates generally the personnel shelter in accordance with applicant's invention, while reference numeral 2 indicates generally the bench portion of the personnel shelter. The bench, in turn, is comprised of a forward support portion 3, a seating portion 4, and a raised back portion 5. The bench is protected by a canopy indicated generally by reference numeral 6 and end walls 7 and 7'. The end walls and bench rest upon platform 8 which is raised above the ground by runners 9. In addition the forward support portion 3 of bench 2 is attached to platform 8 by removable fasteners 10 and the end walls 7 and 7' are similarly attached to the platform by removable fasteners 11 and 11'.

As is best shown in FIG. 3, the forward support portion, the seating portion, and raised back portion of the bench are manufactured together in a single form of molded plastic. The seating area is corrugated for strength and to provide a surface which is easier to keep dry during inclement weather. While any plastic having appropriate mechanical properties may be utilized in molding the bench seat, a textured sheet of Noryl plastic one-fourth inch thickness has proved satisfactory. A removable panel 12 which may also be of textured Noryl sheet completes the bench unit.

FIG. 2 shows that the bench seat is braced by the strap steel brackets 13. In addition, the seat is braced by metallic tubes 14 best shown in FIG. 3 which extend

from the platform to the upper surface of the raised back portion. FIG. 3 shows that metallic tubes 14 are properly sized and spaced to receive the ends of channels 15 while FIG. 1 shows that channels 15 and sections 16 of a transparent, lightweight and flexible material together comprise canopy 6. While any material with suitable mechanical and optical properties may be used for the transparent sections and end walls, it has been found that cold-formed Lexan has excellent optical clarity as well as toughness.

FIG. 4 in which the left side faces the sheltered area, shows how the transparent section 16 is attached to channels 15 by adjusting screws 17 and washer strip 18. FIG. 5 shows how transparent section 16 is attached to the left channels 15 by washer strip 19 and adjusting screw 20. In addition, this figure also shows adjusting screw 21 and washer 22 which fasten end wall 7 to channel 15.

FIG. 2 best demonstrates the positioning of top heater 23 and bottom heater 24. Both of these heaters are removably attached to bench 2 by one-way fasteners 25 which allow the heaters to be removed from inside the bench once the removable panel 12 has been removed. FIG. 2 shows that the radiation of top heater 23 has its greatest effect on the lower back of a person seated upon seating portion 4 while bottom heater 24 is directed towards the feet of a seated person.

The combined effect of these heaters 23 and 24 produces a most complete warming effect on the seated person because heater 24 directly warms the feet while heater 23 warms the lower back of a seated person, the most critical portion of the body for heating purposes, as well as the persons hands which are normally at the seat level.

The heaters may take any form which is thermally suitable. However, electrically powered infra-red heaters have been found desirable for this use. The temperature of the heaters is adjusted through the upper dial of conventional heater controls 26 and other known circuitry which is not shown.

When it is desired to use the personnel shelter in a warm environment, the fan motor 27 shown in FIG. 6 is energized by depressing the lower button shown in temperature control 26. The fan motor causes the conventional fan 23 to draw air in through inlet in bottom panel 12 and to discharge air through the evaporator sheet 30 into manifold 31. The evaporator sheet 30 is supported in the water tank 32 and thus the water lost by evaporation is continually replenished.

The air cooled by pressing through the evaporator sheet into the manifold 31 is led through ducts 33, 34 and 35 to channels 36, 37 and 38, respectively. The channels are disposed parallel to the top and bottom of the raised back portion 5 of the bench and the forward support portion, respectively, and these channels communicate with the sheltered area through pairs of vents 39, 40 and 41, respectively.

At certain times it is desirable to cool but not to chill personnel coming to the shelter area from a very hot area adjacent thereto. In this case, the evaporator sheet 30 may be removed and the fan 28 connected directly to the manifold 31. The personnel seated upon the bench will then be subjected to air at essentially ambient temperatures which aids their normal bodily evaporative process to gradually cool them.

It may also be desirable to cool the sheltered area more than is possible with the evaporator described above. In this case, as shown in FIG. 7, the fan 28 and evaporator sheet 30 can be replaced by a conventional air refrigeration unit 42 which can be connected by the same ducts as above to the sheltered area and can be operated as the fan was by temperature control 26.

Both of the above described cooling devices may logically be placed at the longitudinal center of the bench 50, as to minimize interference with the heaters. In an alternate embodiment, however, the heater units may be removed and replaced by channel units 43 and 44. In this event, of course, the channels 37 and 38 and the pairs of vents 40 and 41 could be dispersed with.

The overall dimensions of the personnel shelter are, of course, variable within the scope of the applicant's invention. Nevertheless, certain design criteria should be followed, for instance, platform 8 should extend far enough in front of bench 2 to allow a person to stand up, and, of course, the canopy should also cover this portion of the platform. In addition, the curvature of the canopy should be such that the seated individual can rise from a sitting to a standing position without coming into contact with the canopy. As to the length of the personnel shelter there are many possibilities. The shelter can be made long enough to seat an entire football team (100 feet or 50 persons) whence it would probably be moved into place by a tractor, or the personnel shelter may be built in modules which are narrow enough (12 feet or six persons) to be maneuvered by a forklift truck whose prongs would extend under the raised platform 8 substantially parallel to the runners 9. If module type personnel shelters were used, any number of persons could, of course, be seated by manipulation of the number of modules. The module embodiment would also be advantageous where the shelter is used by small groups of people such as commuters on mass transportation or the other groups discussed above.

The height of the platform above the ground is not critical as long as the platform is raised from the ground enough to provide a surface which is easy to keep clean.

It should be apparent that since the canopy, end walls, and heaters and cooling equipment, are all removably fastened to the bench these items can be removed if it is desired to use the bench as a simple open bench during fine weather.

What is claimed is:

1. A personnel shelter comprising a bench having a forward support portion, a seating portion, and a raised back portion, a canopy extending upward from the upper surface of said raised back portion and curving above said bench, means for securing said canopy to said bench, a wall positioned at each end of said bench having one edge shaped to make a flush joint with said canopy and means removably attached to said bench for conditioning the air within the area defined by said canopy and said end walls, said canopy comprising a plurality of sections of transparent light weight, flexible material, the edges of said sections being removably fastened to channels whereby said sections are given support and curvature.

2. A personnel shelter comprising a bench having a forward support portion, a seating portion, and a raised back portion, a canopy extending upward from the upper surface of said raised back portion and curving above said bench, means for securing said canopy to said bench, a wall positioned at each end of said bench

having one edge shaped to make a flush joint with said canopy and means removably attached to said bench for conditioning the air within the area defined by said canopy and said end walls, said seating, raised back and forward support portions comprising a single form of molded plastic, said bench having a back panel adapted to mate with said form of molded plastic and to be removably fastened thereto.

3. A personnel shelter comprising a bench having a forward support portion, a seating portion, and a raised back portion, a canopy extending upward from the upper surface of said raised back portion and curving above said bench, means for securing said canopy to said bench, a wall positioned at each end of said bench having one edge shaped to make a flush joint with said canopy and means removably attached to said bench for conditioning the air within the area defined by said canopy and said end walls, said shelter further including a raised platform upon which said bench rests and to which said forward support portion of said bench and the lower edges of said end walls are removably fastened.

4. A personnel shelter comprising a bench having a forward support portion, a seating portion, and a raised back portion, a canopy extending upward from the upper surface of said raised back portion and curving above said bench, said shelter having channel members for securing said canopy to said bench, a wall positioned at each end of said bench having one edge shaped to make a flush joint with said canopy and means removably attached to said bench for conditioning the air within the area defined by said canopy and said end walls, said shelter having tubular braces disposed parallel to the rear of said bench, said tubular braces being properly sized and spaced to receive said channel members.

5. The personnel shelter as claimed in claim **1** wherein said means for conditioning the air comprises a heater removably attached to the raised back portion of said bench.

6. The personnel shelter of claim **1** wherein said means for conditioning the air comprises a heater removably attached to the forward support portion of said bench.

7. The personnel shelter of claim **6** wherein said heating means also comprises a second heater removably attached to the raised back portion of said bench.

8. The personnel shelter of claim **6** wherein said first and second heaters comprise electrically powered infra-red heaters.

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