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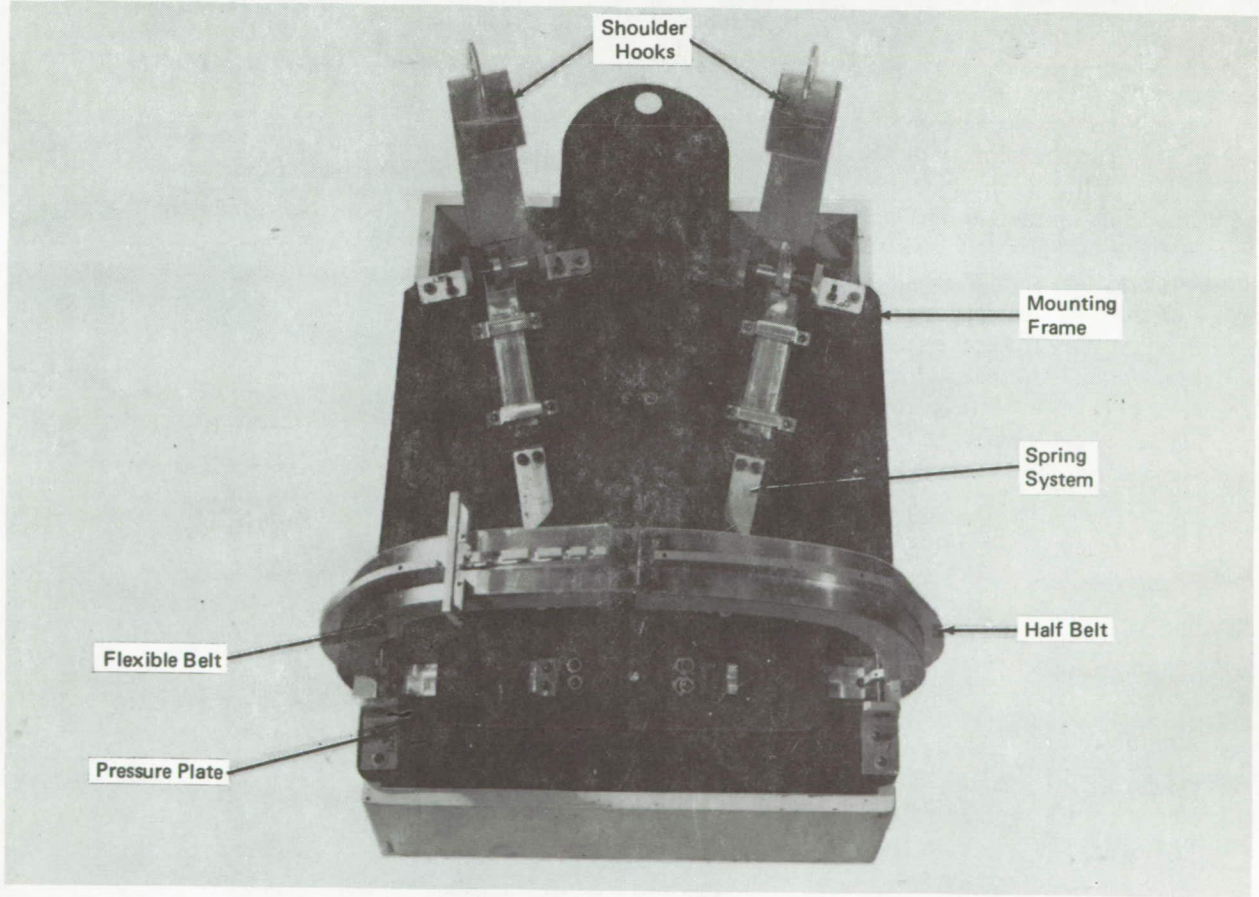
Quick-Donning Backpack Harness

The quick-donning backpack harness is a device which permits the user to quickly put on or take off a load carried in a backpack arrangement. It can be attached to the user with one hand; has a controlled deformation belt that automatically encircles the user upon proper application of pressure; has rigid shoulder harness elements which automatically move into position for carrying the load; and its primary attachment components cannot be displaced while harness is in place.

This harness is basically composed of a mounting frame to which the load is attached, a pressure plate, a spring system, a pair of shoulder hooks, two controlled deformation or rigid half-belts, and a short length of flexible belt which is used to fasten the free ends of the half-belt in place. These components are mounted on the mounting frame in such a manner that movement of the pressure plate toward the mounting frame forces the shoulder hooks and half-belts into position over the shoulders and about the waist of the user.



(continued overleaf)

The quick-donning backpack harness, as seen in the illustration, has a mounting frame for support of the load to be carried. The shoulder hooks are curved and extend down to permit a hanging-type arrangement. The extensions of the shoulder hooks curve outwardly from the mounting frame and down to the pressure plate where they are rigidly fastened. Guides hold the extensions to the shoulder hooks in their proper positions. Pressure on the pressure plate causes it to move toward the mounting frame and forces the shoulder hooks into position over the shoulders of the user.

The version of the waist belt shown in the illustration consists of two rigid half-belt sections and a flexible section. The rigid sections are secured to the pressure plate through a semi-rigid spring-steel system. The spring-steel curves away from the pressure plate and then forward to unite with the waistbelt rigid sections. The flexible waistbelt end is connected to one curved half-belt, and the receiver lock is attached to the other. With this arrangement, pressure placed on the pressure plate causes the spring steel portion of the waistbelt to move to the rear or toward the mounting frame, and this causes the curved half belts to encircle the waist of the user. Guides function to locate the waistbelt in its proper position relative to the pressure plate and mounting frame.

This construction permits the user to lock the half belts and shoulder hooks by using one hand to connect the flexible belt end to the belt lock.

A flexible belt of webbing with spacers and a spring member can also be used with the harness. The belt webbing is attached to the mounting frame on one end and to the spring member at the other "beltbuckle" end. The other end of the spring member is attached to the pressure plate. The spring member lies along the outer surface of the belt webbing, away from the user's body. Pressure on the plate forces the spring member, because of its freedom to slide in the spacers and its fixed relationship to the belt, to deflect inwardly to effect the encircling action by the waistbelt of the body of the user of the harness. For those applications where rigid shoulder hooks are not desirable this waistbelt design could be adapted for use as a shoulder harness.

Ease of use and the requirement that an overt act would have to be committed to disable the harness make it practical for use as safety equipment such as: automobile or airplane safety harnesses, emergency breathing or other special equipment, quick donning and doffing harness for emergency vehicle personnel, or patient restraints for litters or stretchers.

The self-deploying and latching features make this harness of possible help to handicapped persons with physiological limitations of arm motion or control or even with wheelchair patients who are not able to hold themselves in the chair,or bed patients requiring restraints.

The flexible belt concept could have general industrial application through its incorporation into load carrying devices such as cargo nets, flat bed trailers, or railway cars. The weight of the material placed upon it would activate the restraining straps which would then enfold the load.

Note:

Request for further information may be directed to:

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Reference: B72-10641

Patent status:

This invention has been patented by NASA (U.S. Patent No. 3,649,921). Inquiries concerning nonexclusive or exclusive license for its commercial development should be addressed to:

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