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NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the space program.

Vacuum-Type Backup Bar Speeds Weld Repairs

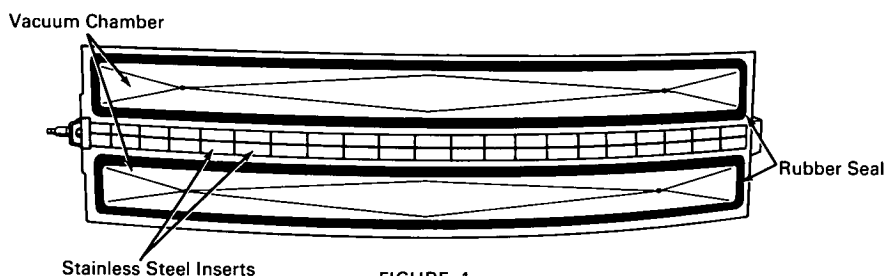


FIGURE 1

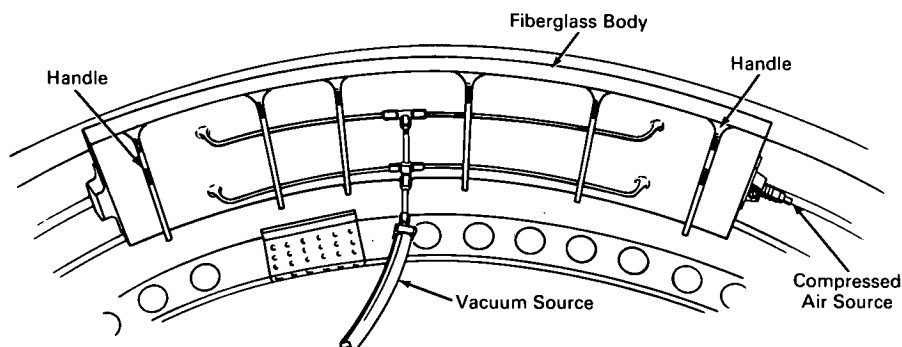


FIGURE 2

The problem: When a faulty section of seam weld is detected in a completed welded metal structure such as a large steel tank, it is necessary to repair the weld section in place. This involves backing up the root of the weld to retain the molten metal. Conventional techniques consume much time and involve fabrication of a backup device and the use of clamps, supports, and other mechanical fixtures.

The solution: A backup bar designed to use both vacuum and air pressure to seal the weld root in a matter of seconds.

How it's done: A backup bar is fabricated with a tube system, a rubber seal, fiberglass vacuum chambers, and a row of small, grooved, stainless-steel inserts mounted in a channel containing a rubber tube attached to an air fitting. The backup bar is curved and is slightly flexible to adapt to a limited size range of surfaces.

The bar is placed against the weld seam to be repaired and a vacuum source applied to remove the air from the vacuum chambers in a matter of seconds. The bar will cling tightly to the structure as long as

(continued overleaf)

the vacuum is maintained. Compressed air is introduced into the rubber tube behind the inserts, pressing them tightly against the weld root. The reverse side of the bar is of fiberglass and mounts two carrying handles.

Notes:

1. The backup bar is 3 feet long, about 8 inches wide, and 1 inch thick, with a weight of about 30 pounds. The same basic design could be used for smaller or larger units.
2. With slight redesign the bar could be made sufficiently flexible to fit any large cylindrical surface.

3. For further information about this innovation inquiries may be directed to:

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Reference: B63-10384

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

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(M-FS-12)