A gas cup extension assembly (10) is mounted on a standard electric welding torch gas cup (11) to enable welding in areas with limited access. The gas cup assembly (10) has a tubular insert (14) that fits within the gas cup (11) but extends a lower externally threaded portion (17) downward through the gas cup exit opening. A tubular extension (18) is screwed onto the threaded portion (17) so as to be placed tight against the lower edge of the gas cup (11). The upper portion (20) of the extension has a rim (21) to define the outer perimeter of the seat edge about the entrance opening so a gasket (24) may be placed to effect an air tight seal between the tubular insert (14) and tubular extension (18). The tubular extension (18) will have its lower portion (19) shaped as desired for the particular welding activity and may easily be replaced with another extension having a different shaped lower portion.

9 Claims, 1 Drawing Sheet
WELDING TORCH GAS CUP EXTENSION

ORIGIN OF THE INVENTION

The invention described herein was made in the performance of work under a NASA contract and is subject to the provisions of Section 305 of the National Aeronautics and Space Act of 1958, Public Law 85-568 (72 Stat. 435, 42 U.S.C. 2457).

TECHNICAL FIELD

This invention relates to a gas shielded electric arc welding torch having a gas cup and more particularly to an extension for the gas cup. The gas cup extension is detachable from the normal electrode welding torch gas cup and may be of any desired configuration or length.

BACKGROUND ART

A recurrent problem in gas shielded electric arc welding is a need to machine special shaped gas cups or extensions. These extensions allow welding in areas which would otherwise be inaccessible because the standard gas cup is too large or not long enough. The extensions most often are made of metal and are slipped onto or fit into the existing gas cup. They are usually bent into shape and plasma sprayed with an insulated coating. But plasma sprayed coatings cause problems when they flake and chip off leaving the exposed base metal which permits an electric arc to cross over to the workpiece and ruin the weld. Also, the flakes and chips may fall directly into the weld and ruin it.

These gas cup extensions were of the slip-on or fit-in type which tended to become loose with usage and often failed to have a good contact between the end of the gas cup and internal threads so as to provide a detachable gas cup extension assembly for the standard gas cup of an electric arc welding torch which is tightly sealed to the gas cup.

STATEMENT OF THE INVENTION

A gas cup extension assembly has been developed that offers welders a degree of flexibility in choosing a suitable extension which can easily be attached to the standard welding torch. The extension assembly consists of a tubular screw piece, having external threads on its lower end portion, that is placed into the gas cup so its external threads protrude from the end of the gas cup, and a tubular extension which can be of any desired shape and length but having an upper portion with internal threads and an internal shoulder that permits the extension to be screwed onto the threads of the tubular screw piece and tighten against the end of the standard gas cup. A gasket is used to effect an airtight seal.

Accordingly, it is an object of the present invention to provide a detachable gas cup extension assembly for the standard gas cup of an electric arc welding torch which is tightly sealed to the gas cup.

Another object is to provide a detachable extension to a gas cup of an electrode arc welding torch which permits the use of a plurality of extensions which may be of different configurations and materials and yet fit the standard gas cup.
What is claimed is:

1. In an electric arc welding torch having a gas cup and an electrode axially extending through an internal passageway defined by a surrounding internal wall of said gas cup, said internal surrounding wall having a lower portion that narrows to form an exit opening and said gas cup directing a cover gas flow through said internal passageway and out through said exit opening to prevent atmospheric contamination of the welding operations, said exit opening having a size which allows an annular space about said exit opening, said gas cup having an edge surface about said exit opening, the improvement comprising:
   a tubular fastener piece loosely fitted within said internal passageway of said gas cup and having a lower portion extending through and below said exit opening.
   said tubular fastener piece having an internal passageway axially aligned with said electrode and of a size that allows an annular space about said electrode,
   said tubular fastener piece having an upper portion larger than said exit opening so it will be held within the internal passageway of said gas cup,
   a tubular extension having an internal passageway axially aligned with said electrode and of a size that allows an annular space about said electrode,
   said tubular extension having an upper edge surface about its internal passageway which is contiguous to said edge surface about said exit opening,
   a heat resistant annular gasket between the upper edge surface of said tubular extension and the edge surface about said exit opening,
   said tubular fastener piece and said tubular extension having cooperating means for telescoping the two together so as to clamp said upper portion of tubular fastener piece to said surrounding internal wall of said gas cup, and to clamp the upper edge surface of said tubular extension and the edge surface about said exit opening to said annular gasket, and for detaching the two from each other so as to replace said tubular extension with one of a different configuration.

2. In an electric welding torch according to claim 1, further comprising:
   said cooperating means for telescoping together said tubular fastener piece and said tubular extension are cooperating screw threads on said tubular extension and on the lower portion of said tubular fastener piece.

3. In an electric welding torch according to claim 1, further comprising:
   said tubular extension having an upper outer rim extending from its upper edge surface and past said annular gasket so as to overlap said gas cup.

4. In an electric welding torch according to claim 3, further comprising:
   said internal passageway of said gas cup being cylindrical.

5. In an electric welding torch according to claim 2, further comprising:
   the internal passageway of said tubular extension being defined by an internal surrounding wall having an upper portion adapted to telescope over the lower portion of said tubular fastener piece, said cooperating screw threads on said tubular extension being on said upper portion of said surrounding internal wall of said tubular extension.

6. An electric arc welding torch, comprising:
   a gas cup with an internal passageway defined by an internal wall of said gas cup, said internal wall having a lower portion that narrows to form an exit opening, said gas cup directing a cover gas flow through said internal passageway and out through said exit opening to prevent atmospheric contamination of the welding operations, said gas cup having an edge surface about said exit opening, a tubular fastener piece loosely fitted within said internal passageway of said gas cup and having a lower portion extending through and below said exit opening, said tubular fastener piece having an upper portion larger than said exit opening so it will be held within the internal passageway of said gas cup, and having an internal passageway axially aligned with the internal passageway of said gas cup, a tubular extension having an internal passageway axially aligned with the internal passageway of said gas cup and the internal passageway of said tubular fastener piece, said tubular extension having an upper edge surface about its internal passageway which is contiguous to said edge surface about said exit opening of the gas cup, a heat resistant annular gasket between said upper edge surface of said tubular gasket and said edge surface about said exit opening of the gas cup, cooperating screw threads on said lower portion of said tubular fastener piece and said tubular extension for telescoping together said tubular fastener piece and said tubular extension so as to clamp said upper portion of said tubular fastener piece to said internal wall of said gas cup and to clamp said upper edge surface of said tubular extension and said edge surface about said exit opening to said annular gasket, and for detaching said tubular fastener piece and said tubular extension so as to replace said tubular extension with one of a different configuration.

7. An electric welding torch according to claim 6, further comprising:
   said tubular extension having an upper outer rim extending from its upper edge surface and past said annular gasket so as to overlap said gas cup.

8. An electric welding torch according to claim 6, further comprising:
   said internal wall of said gas cup being cylindrical, an electrode extending axially through said internal passageways of said gas cup, said tubular fastener piece, and said tubular extension.

9. An electric welding torch according to claim 6, further comprising:
   the internal passageway of said tubular extension being defined by an internal surrounding wall having an upper portion adapted to telescope over the lower portion of said tubular fastener piece, said cooperating screw threads on said tubular extension being on said upper portion of said internal surrounding wall of said tubular extension.