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受験番号：06IPM004

科目：「機械工学」

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[問 1]

START

BACKGROUND OF THE INVENTION

2. Description of the Related Art

To date, soil improvement methods based on the injection of hardeners have made progress through much trial and error. In particular, like the method disclosed in Japanese Unexamined Patent Publication No. 5-9923, conventional methods have been based on original ideas, but been equipped with no drilling or mixing blade.

SUMMARY OF THE INVENTION

In order to improve the effectiveness of such soil improvement methods, the present inventor has devised a soil improvement apparatus having a mixing blade. Furthermore, the present inventor has also developed an apparatus having a so-called drilling blade, which has a drilling function in addition to the mixing function of the mixing blade, wherein a hardener is injected through the tip of the drilling blade. As a result, an innovative hard soil improvement system that eliminates or reduces conventional problems or drawbacks has been achieved. The present inventor has filed an application for the set of techniques.

END

[問 2]

START

In a first embodiment of the present invention, the arrangement of a wristwatch 100 having a spring winding status indicator may be configured as described below, for example, the arrangement including a barrel gear 120d, a square-socket gear 130, a first sun gear 150, a first planetary gear 152, a second planetary gear 154, a second sun gear 156, a first power-reserve intermediate gear 180, a first segment gear 184c, a second segment gear 184g, and a power-reserve indicating gear 190. Specifically, exemplary conditions are as follows: the number of teeth for the barrel gear 120d: 84; the number of teeth for the square-socket gear 130: 62; the number of teeth for the first sun gear 150: 20; the number of teeth for the first planetary gear 15: 24; the number of teeth for the second planetary gear 154: 20; the number of teeth for the pinion of the second planetary gear 154: 12; the number of teeth for the first power-reserve intermediate gear 180: 48; the number of teeth for the pinion of the first power-reserve intermediate gear 180: 8; the number of teeth for the second sun gear 156: 24; the number of teeth for the first segment gear 184c (calculated value when teeth are provided throughout the perimeter): 200; the number of teeth for the second segment gear 184g (calculated value when teeth are provided throughout the perimeter): 104; and the number of teeth for the power-reserve indicating gear 190: 13.

In this arrangement, the reduction ratio of the barrel gear 120d to the power-reserve indicating gear 190 is 1:18. When the number of turns of the spring is 6, a pointer 196 mounted on the power-reserve indicating gear 190 can move through 120 degrees. When the number of turns of the spring is 7, the pointer 196 mounted on the power-reserve indicating gear 190 can move through 140 degrees.

END

[問 3]

START

What is claimed is:

1. A TIG welding apparatus, comprising:
welding current supply means for welding operation;

shielding gas supply means for supplying two types of gases;

a tungsten electrode connected to the welding current supply means;

a welding torch connected to the shielding gas supply means, the welding torch having a gas injection port for injecting a gas around the tungsten electrode and being coaxially arranged so as to form an inner-and-outer double gas shield;

a wire feeding device for continuously feeding a plurality of wires serving as a filler metal to a welding arc generating site;

a heating device to be connected to the plurality of wires except at least one of them, the heating device being adapted to heat the wires; and

gas supply rate controlling means connected to the shielding gas supply means, the gas supply rate controlling means being adapted to control supply rate of gas from the shielding gas supply means.

2. The TIG welding apparatus according to Claim 1, wherein the plurality of wires except at least one of them are solid wires, the solid wires being heated by the heating device to become hot wires; and wherein the at least one of them is a stranded wire serving as a cold wire.

3. The TIG welding apparatus according to Claim 1, further comprising:

wire feeding rate controlling means connected to the wire feeding device, the wire feeding rate controlling means controlling feeding rates of the wires.

END