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(21) Application No. 14637/77 (22) Filed 6 Apr. 1977  
 (31) Convention Application No. 2617903 (32) Filed 23 Apr. 1976 in  
 (33) Fed. Rep of Germany (DE)  
 (44) Complete Specification Published 23 Jul. 1980  
 (51) INT. CL.<sup>3</sup> B23K 7/00  
 B28D 1/00 //  
 E21C 21/00



(52) Index at Acceptance

B3V 4B2  
 B5E X6  
 E1F 5  
 F4T 119 ED

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(54) IGNITING OF THERMIC LANCES

(71) We, HILTI AKTIENGESELLSCHAFT, a Corporation organised and existing under the laws of the Principality of Liechtenstein, of Schaan, Liechtenstein, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention relates to a method of, and means for use in, igniting a thermic lance, for use in the cutting or boring or hard materials, such as concrete, rock and steel having an outer tube with a plurality of core wires present therein, oxygen being supplied between the wires and between the latter and the outer tube, in which the thermic lance is caused to ignite by bringing its front end into contact with or into the vicinity of burning material.

Oxygen-burning thermic lances have been used for a long time for boring holes, as well as for demolition work, and in the course of time such thermic lances have been developed and improved. Since nowadays they are relatively easily controllable, they are produced in smaller sizes for performing finer work. One such use is for example, the cutting of reinforcing bars or rods, when these are encountered during the drilling of dowel holes in reinforced concrete.

However, problems have been encountered in igniting these oxygen-burning thermic lances. In the past, ignition has been effected by heating the thermic lance to white heat at its front end, for example with the aid of a welding torch, thereby to ignite the same. As an alternative possibility, the front end of the thermic lance is brought into contact with or into the vicinity of glowing

charcoal or smouldering wood whilst oxygen is being fed therethrough. However, these methods are complicated and time-consuming. Particularly in relation to work in which a thermic lance has to be ignited relatively frequently, the known methods are not satisfactory.

The problem underlying the invention is to provide a method of, and means for, achieving rapid and simple ignition of an oxygen-burning thermic lance.

Pursuant hereto, the invention provides for the front end of the oxygen-burning thermic lance to be brought into contact with or into the vicinity of a burning body, independent of the lance and formed of magnesium particles, and is thereby ignited.

When magnesium burns, as is well known, considerable heat is developed. It thus takes only a very short time for the oxygen-burning thermic lance to reach the necessary temperature to ignite when using the method of the invention. Furthermore, the method of the invention has the advantage that smouldering or glowing materials do not have to be permanently present in the vicinity of the person using the thermic lance during the work. The risk of fire is, thus, considerably limited.

The body used for the ignition can take various forms. It is, for example, advantageous for the body formed of magnesium particles to be pressed from magnesium powder. Such a pressed powder body is very compact and, in addition, has the advantage that it is generally combustible only when oxygen is fed to its vicinity. If desired, auxiliary substances which influence the combustion of the body can be added to the body.

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In an advantageous version the body formed of magnesium particles is pressed from magnesium chips. In this event, for instance waste magnesium chips, arising in the processing of materials consisting of magnesium or magnesium alloys, can be used directly. The combustion properties of the body, consisting of magnesium chips, can be influenced by pressing with a greater or lesser pressure. For handling purposes, it is particularly advantageous if the body formed of magnesium particles is pressed into a tablet. Such a tablet has the advantages that it can be shaped so as to have no corners which crumble away easily and also so as to be simple to pack. For different sizes of thermic lances, the tablet can be produced in different sizes.

For facilitating ignition of the body formed of magnesium particles it is advantageous for an ignition aid, consisting of easily-ignitable material to be added to the body. Such an ignition aid is particularly advantageous in the case of very firmly pressed magnesium bodies which will burn only when oxygen is fed thereto, since then the easily-ignitable ignition aid can be ignited first and only then does the supply of oxygen have to be ignited. The risk of accident is thereby considerably reduced. As examples, a fuse tape (or fuse cord) of the type used in pyrotechnics, or a thin magnesium strip, can be used as the ignition aid. However, use could be made of wire wool threads.

In order to retain and concentrate the heat arising during ignition of the thermic lance and to minimise the effect of external influences, such as wind, which may be disturbing when working in the open air, it is advantageous for the ignition of the thermic lance to be effected in a crucible. Such a crucible provides, in addition, the advantage that it screens off from the user the very severe glaring effect arising from the burning magnesium. Moreover, the crucible guarantees that the ignition of the body formed of magnesium particles is always effected on a fireproof substrate.

The invention will be described further, by way of example, with reference to the accompanying drawing in which the single figure is a sectional elevation illustrating a preferred manner of carrying the method of the invention into effect, and preferred means therefor.

In the drawing, a thermic lance, designated as a whole by the numeral 1, comprises an outer tube 2, and core wires 3 drawn therein. Gaps 4 are present between the core wires 3 themselves, and between the wires 3 and the outer tube 2, and these enable oxygen to be supplied through the thermic lance 1.

Arranged in an open-topped crucible 5 is a body 6 made of magnesium particles. The body 6 has a wick 7 which serves as ignition aid. For igniting the thermic lance 1, the body 6 formed of magnesium particles is inserted into the crucible 5 and is ignited with the aid of the wick 7. Then one introduces the front end 1a of the thermic lance 1 into the crucible 5 and turns on the oxygen supply. Because of the presence of the oxygen, the body 6 begins to burn violently; the front end 1a of the lance 1 is accordingly heated by the resulting rapid development of heat, up to white heat, and finally itself begins to burn. If, when the thermic lance has been ignited and withdrawn from the crucible 5, the entire body 6 formed of magnesium particles has not been consumed, then by simply covering of the open top of the crucible 5 the combustion of the body 6 can be brought to a halt. It may then be possible to use the body a second time for the ignition of the thermic lance 1.

WHAT WE CLAIM IS:-

1. A method of igniting a thermic lance, for use in the cutting or boring of hard materials such as concrete, rock and steel, having an outer tube with a plurality of core wires present therein, oxygen being supplied between the wires and between the latter and the outer tube, and wherein the thermic lance is caused to ignite by bringing its front end into contact with or into the vicinity of burning material, characterised in that the front end of the thermic lance is brought into contact with or into the vicinity of a burning body, independent of the lance and formed of magnesium particles, and is thereby ignited.
2. A method as claimed in claim 1, characterised in that the body formed of magnesium particles is pressed from magnesium powder.
3. A method as claimed in claim 1, characterised in that the body formed of magnesium particles comprises pressed magnesium chips.
4. A method as claimed in claim 1, 2 or 3, characterised in that the body formed of magnesium particles is pressed into a tablet.
5. A method as claimed in any preceding claim characterised in that an ignition aid, consisting of easily-ignitable material, is added to the body formed of magnesium particles.
6. A method as claimed in any preceding claim characterised in that the ignition of the thermic lance is effected in a crucible.
7. A method of igniting a thermic lance substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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Printed for Her Majesty's Stationery Office,  
by Croydon Printing Company Limited, Croydon, Surrey, 1980.  
Published by The Patent Office, 25 Southampton Buildings,  
London, WC2A 1AY, from which copies may be obtained.

