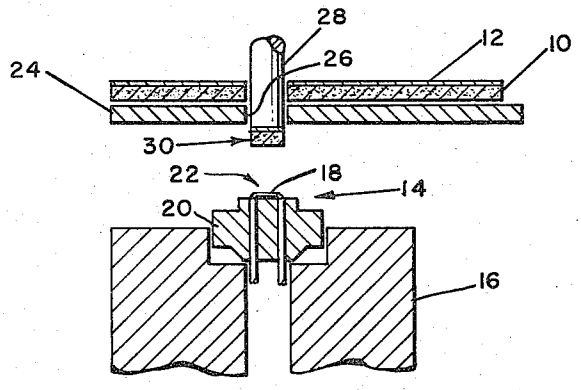
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METHOD OF APPLICATION OF MICRO-PRIMING SPOTS

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METHOD OF APPLICATION OF MICRO-PRIMING SPOTS

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1 Claim. (Cl. 86—1)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to us of any royalty thereon.

This invention relates to explosive devices and more particularly to a method for application of micro-priming spots to initiator or delay element plug assemblies.

In the manufacture of certain explosive initiators or delay elements, it is often required that a small accurate quantity of priming mixture be applied. The present method of application involves tedious relatively inaccurate manual application employing means such as a wire loop or brush. As a necessary consequence, this method results in a fairly high incidence of delay element malfunctioning or rejects due to either excessive or insufficient amounts of the priming mix applied to the delay element plug assemblies.

An object of this invention is to provide a continuous automatic transfer process for the application of micro-priming spots.

Another object is to provide a method for application of an accurately measured amount of priming mixture or explosive to an initiator or delay element plug assembly.

Still another object is a method for application of accurate charges of explosive primer material for delay elements, which method is capable of producing very accurate short time delay intervals.

A further object is an extremely safe and efficient method for handling and applying micro-priming spots.

A still further object is a method of priming spot application capable of producing an initiator bridge assembly possessing improved strength, stability and rigidity.

An important object is to provide a method of priming spot application capable of producing an initiator in which variables in detonating function are virtually eliminated.

Briefly the method of this invention involves the punching of a disc from a primer-coated carrier onto an adhesive surface of an initiator assembly. Upon proper curing of the composite structure a relatively accurate preset delay element is obtained.

The specific nature of the invention, as well as other objects, uses, and advantages thereof, will clearly appear from the following description and from the accompanying drawing, in which:

The figure is a sectional view of apparatus for applying priming spots in accordance with the present invention.

The method presented by the present invention may best be understood with reference to the drawing.

A primer mixture **10** such as lead styphnate containing or suspended in a binder lacquer or similar material possessing adhesive and heat consumable properties and characteristics may be supported on carrier **12**. Carrier **12** may assume any suitable configuration and is preferably provided in strip form, the length of which may be selectively varied to be commercially available on rolls. In addition, carrier **12** may be relatively thin and for some practical applications can assume a thickness of 0.003 inch. Paper or other suitable material performs satisfactorily as carrier **12**. Mixture **10** may also selectively vary in thickness according to specified requirements and for some intended uses is 0.010 to 0.015 inch thick. Mixture **10** can be applied to carrier **12** by many coatings or other suitable techniques. This composite strip may then be allowed to dry in an oven at approximately 60 to 70 degrees C. to effect proper curing.

At predetermined intervals along carrier **12**, mixture **10** may be interrupted by a non-consumable barrier or non-application of mixture **10** either transversely, longitudinally or both. This may be an added safety feature to prevent sympathetic detonation of the entire strip should one end be accidentally ignited.

The primer may also be conveniently applied to carrier **12** by initially coating in any suitable manner a consumable binding agent or adhesive on carrier **12** and then supporting the primer thereon by coating or the like, followed by a suitable curing operation.

The initiator or plug assemblies **14** are manually, mechanically or automatically placed or supported in a suitable holder **16** or series of holders. Assembly **14** may feature a bridge or similarly purposed electrical filament **18** which in turn may be suitably supported or partially housed in base **20** in any well known manner.

A light application of a lacquer binder solution or suitable adhesive which may be of a consumable nature is preferably applied to the plug assemblies **14** and still more preferably on and in close proximity to bridge **18** on that area designated generally at **22**.

Carrier **12** with the cured coating **10** thereon is preferably supported on a suitable die plate **24** which is conveniently suspended or mounted over holder **16**. Plate **24** is provided with an aperture **26** through which a punch **28** may reciprocate manually, mechanically or automatically. A plurality of punch-aperture combinations may be employed to conform with the amount of plug assemblies or desired method of mass production contemplated as will be readily understood by those skilled in the art in view of the present teachings. Coating **10** is preferably in juxtaposition with plate **24** substantially as shown and aperture **26** with its companion punch **28** are preferably disposed directly over that portion **22** on which it is desired to have the primer mixture **10**.

The punch **28** is then moved downward, shearing or punching a disc or spot **30** directly and firmly onto the wet or freshly lacquered plug assembly substantially at **22**. As shown in the figure, disc **30** is carried by the end of punch **28** during its downward movement. The carrier **12** of disc **30** functions as a reinforcing means and may be permitted to remain on the primer spot **30** to be ultimately consumed when the explosive action takes place.

The next step in preparing the assembly may be to spray lightly over the entire surface of the plug with a thin solution of a lacquer or other suitable consumable coating.

The composite units may then be oven dried at temperatures approximating 60 to 70° C. to effect proper curing of the various coatings applied.

Assembly **14** may utilize two exposed terminals instead of bridge **18**. Accordingly, a conductive or semiconductive material which preferably is relatively inert may be suitably coated on or incorporated in primer mixture **10** to be ultimately in contact with the exposed terminals. An aqueous suspension of the inert material

may be employed for suitable coating applications and may be applied immediately after application of mixture **10** to take advantage of the adhesiveness of the latter while in an uncured state.

The method of application of the primer spot described is extremely safe and lends itself to mass production by use of multiple stage machines which heretofore has not been possible with the presently employed manual method of application.

It will be apparent that the embodiments shown are only exemplary and that various modifications can be made in construction and arrangement within the scope of the invention as defined in the appended claim.

We claim:

A method of applying micro-priming spots, said method comprising the steps of: supporting two electrical terminals in close proximity to one another and incorporating a conductive bridge therebetween; applying a binder lacquer to said bridge; punching a disc from a carrier having a cured coating of a primer lacquer thereon; continuing the punching movement so that said disc is carried to said bridge and pressed thereagainst with said coating of conductive material in contact with said binder lacquer; spraying the assembled structure with a consumable lacquer; and oven-drying said assembled structure to provide a rigid resultant structure.

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