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<td>Anti-cut safe panel</td>
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<tr>
<td>International Patent Classification(s)</td>
<td>E05G 1/024 (2006.01)</td>
</tr>
<tr>
<td>Application No</td>
<td>2007101187</td>
</tr>
<tr>
<td>Date of Filing</td>
<td>2007.12.14</td>
</tr>
<tr>
<td>Publication Date</td>
<td>2008.01.31</td>
</tr>
<tr>
<td>Publication Journal Date</td>
<td>2008.01.31</td>
</tr>
<tr>
<td>Granted Journal Date</td>
<td>2008.01.31</td>
</tr>
<tr>
<td>Certified Journal Date</td>
<td>2008.02.14</td>
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An anti-cut panel for a safe or like enclosure, said panel comprising a housing adapted to receive and house one or a plurality of refractory ceramic tiles wherein said tiles are fixed within said housing and coated by an epoxy resin.
Invention Title:

Anti-cut safe panel

The following statement is a full description of this invention including the best method of performing it known to us:-
Introduction to the Invention

This invention relates to the retrofitting of additional security panels to safes, automatic teller machines and other security enclosures, which are vulnerable to attack using oxyacetylene torches, grinding wheels and other power tools available to persons of unlawful intent. In particular, the invention relates to streamlined reinforced panels, particularly adapted for retrofitting to the interior and exterior of safes and other secure enclosures with minimal intrusion into the available space in these type of enclosures.

Background to the Invention

The increased prevalence of automatic teller machines in public spaces has increased the exposure of such secure enclosures to attack by bandits and other unauthorised personnel. The increased presence and availability of automatic teller machines which represent, in effect, compact safes for holding money for dispensing, has dramatically increased the exposure of safes in general to attack where unlawful persons having access to cutting torches, grinding wheels and powered drilling and boring machinery frequently target such machines using the above tools for forced entry.

In an endeavour to minimise such exposure, automatic teller machines are provided with a variety of locking systems and various forms of reinforcement to minimise exposure. However, such devices remain vulnerable to unlawful persons with access to the above described tools.

Amongst the current endeavours to minimise such attacks, anti-cut and impact resistant plates have been devised for retrofitting to the interior and exterior of safes, automatic teller machines and the like. Among such panels include heavyweight, thick panels incorporating abrasive materials which have been formed for fitting to the interior of such enclosures. However, such panels take up excessive interior space of a safe and furthermore, such panels using available abrasive materials, remain vulnerable due to the brittle nature of such abrasive materials which whilst resisting cutting, remain vulnerable to attack by hammers and the like once unlawful entry to the original body of the safe is accomplished.

One object of this invention is to provide an improved anti-cut panel adapted for streamline retrofitting to the interior and exterior of safes, automatic teller machines and the like.
Statements of the Invention

In a first aspect the invention provides an anti-cut panel for a safe comprising a housing adapted to receive and house one or a plurality of refractory ceramic tiles wherein said tiles are fixed within said housing and coated and at least partially permeated by an epoxy resin.

The refractory ceramic tiles most preferably include nitride silicone carbide and can be made up of one or a plurality of tiles suitably sized and configured for fitting within the housing.

The epoxy resin is most preferably chosen from a resin having suitably low viscosity to allow the resin to permeate the open pores of the refractory material in addition to forming a bed and completely encasing and sealing said refractory tiles within said housing. The epoxy resin viscosity is preferably chosen from the viscosity of about 40 mPa.s when measured at 20°C.

The housing is preferably formed of mild steel or the equivalent thereof wherein the housing includes a peripheral lip formed up to a height corresponding and sufficient to hold the one or more refractory tiles within said housing.

In another aspect the invention provides a secure enclosure of the form of a safe or an automatic teller machine or the like characterised by including the fitting of any one or more of the panels as previously described to the interior and/or the exterior thereof.

Detailed Description of the Invention

One embodiment of the invention will now be described with reference to the following:

Figure 1 shows a cross-section side view of an interior panel;
Figure 2 shows a cross-section side view of an exterior panel;
Figure 3 shows a safe fitted with interior and exterior panels;
Figure 4 shows another view of a safe fitted with interior and exterior panels;
Figure 5 shows a safe door in exploded view fitted with panels;
Figure 6 shows a safe door interior view fitted with panels;
Figure 7 shows a safe door exterior view fitted with panels.

Legend
1. Housing
2. Refracting tiles
Referring firstly to Figures 1 and 2, cross-section side views of the interior and exterior panels of the invention are shown, where both the interior and exterior panels share a similar streamline and compact form including a housing 1 in the form of a mild steel tray having a flat base 10 with peripheral lips 11 formed therefrom. The housing is preferably formed of mild steel but can be formed of any similar or appropriate material capable of housing or holding the refractory ceramic tile or tiles 2 within the confines of the housing 1. The refractory ceramic tiles are preferably chosen from nitride silicone carbide which exhibits high strength, high thermal conductivity, high thermal shock resistance, high wear resistance and resistance to attack by acids and oxidation. In addition, the nitride bonded silicone carbide refractory ceramic tiles exhibit a high level of abrasion resistance and perform the function of resisting forced entry, either by the application of extreme heat under oxyacetylene torches, or the application of grinding and abrasive attack where any such attack finds high resistance by the inherent resistance to abrasion of the nitride bonded silicone carbide material.

The silicone carbide tiles 2 are held within the housing 1 by application of an epoxy resin which serves the purpose of bedding in the tiles to the housing and also serves a second and additional purpose, of permeating the porous orifices of the silicone carbide tiles. The epoxy resin is chosen to have a suitably low viscosity of about 40 mPa.s when measured at 20°C, which provides sufficient viscosity and flow characteristics, allowing the epoxy resin to not only form a bed and fixture for the silicone carbide tiles within the housing, but is also sufficient to allow the epoxy resin to permeate deep within the tile structure so as to provide additional and unexpectedly high resistance to shock and fracture to the tiles by virtue of the binding and setting characteristics of the epoxy resin.
Figure 2 shows a cross-section side view of an exterior panel which in all respects mirrors the interior panel shown in Figure 1, with the addition of a 6mm mild steel reinforcing panel 4, fitted between the base 10 of the housing 1 and the refractory tiles 2. The incorporation of an additional mild steel reinforcing plate 4 to the exterior panel provides additional means of reinforcement to the exterior panels. In addition, the reinforcing insert 4 provides a means for mounting lugs, bolts or other fastening means as a way of fitting and securing the exterior panel to the outside of a safe or automatic teller machine.

Referring now to Figures 3 and 4, one particular embodiment of the invention is shown with the panels applied to the interior and exterior of a safe 5, including application to the interior and exterior of the safe door 6. The anti cut panels of the invention, are secured strategically to the interior of a safe by way of lugs 12 or the equivalent thereof in the form of bolts or other mechanical fastening means. In addition, the interior and exterior panels can be adhered to the safe by the use of epoxy as previously described in a manufacture of the panels per se.

Referring to Figures 5, 6 and 7, the application and use of the anti cut panels of the invention are shown as applied to a safe door where the configuration and strategic placement of the panels is shown in the manner whereby the interior panels have been applied to protect the hinge region 13 of the safe door. In an analogous manner, the exterior plates are strategically positioned to protect the interior locking mechanicals of the door so as to minimise exposure of the access points available to unlawful persons attempting forceful entry to the safe.

The invention provides for the first time, dedicated and streamlined retro-fittable anti cut panels incorporating and providing resistance to unlawful entry to an enclosure by the combined use of the high level of resistance to heat an abrasion provided by refractory materials which have been modified in accordance with the construction and manufacture of the panels of the invention to overcome the inherent weaknesses of such refractory materials specifically being their vulnerability to fracture and brittleness, which in prior art panels have allowed unlawful persons to gain entry to a safe or other secure enclosure by burning or torching a hole in the side of the safe, thereby allowing access to positioned interior plates, whereby the removal of that portion of the safe wall provides access to the abrasive materials included in the prior art plates which although resistant to abrasion and heat, are vulnerable to the fracture and could be broken and dismantled by attack with hammers, chisels and the like. The plates of the invention overcome this weakness where the use of epoxy resin materials as previously describe, provide not only a binding material for holding the plates 190626_1.
thermally and strategically in place, but also provide an unexpectedly high level of permeation into the refractory plate materials so as to provide a high level of resistance to fracture, thereby effectively forcing any unlawful entry to persist with the laborious and time consuming abrasion of the refractory materials in order to gain unlawful access to the enclosure. The additional time required to gain unlawful access to enclosures fitted with the panels of the invention, provides a valuable additional time for law enforcement agencies to intercept and stop such unlawful and attempted forced entry.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An anti-cut panel for a safe or like enclosure, said panel comprising a housing adapted to receive and house one or a plurality of refractory ceramic tiles wherein said tiles are fixed within said housing and coated and at least partially permeated by an epoxy resin.

2. An anti-cut panel according to claim 1, wherein said refractory ceramic tiles include nitride silicone carbide.

3. An anti-cut panel according to claim 1 or 2, wherein said epoxy resin has a low viscosity of about 40 mPa.s at 20°C.

4. An anti-cut panel according to any one of claims 1 to 3, wherein said housing is formed of mild steel having a lip of a height corresponding to the thickness of said fixed refractory tiles.

5. A secure enclosure characterised by the fitting of one or more anti-cut panels according to any one of claims 1 to 4 to interior and/or exterior surfaces thereof.
Figure 3