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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Portable Means for Marking Glass and the like

I, FRANCIS ROCKLIFFE PALMER, a British Subject, of 256 Uppingham Road, Leicester, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the marking of glass and like hard substances. For convenience, reference will hereinafter be confined to the marking of glass, although it is to be clearly understood that, as will be readily apparent from the ensuing description, the invention is applicable to the marking of like relatively hard substances.

Now glass frequently requires to be permanently marked. For example glass articles require to be permanently marked with trade marks, legends and like information.

A known method of marking glass is abrading, i.e. spraying with finely divided abrasive material, the requisite areas of the glass to be marked. Thus, this may be effected by applying to the surface which is to be marked a stencil, i.e. a plate or the like which is apertured to the form of the required marking, and then spraying on to the plate, from a spray gun, a stream of the finely-divided abrasive material.

Manifestly, such an operation can usually only be effected in the workshop or factory, as otherwise the stream of abrasive would be dispersed. Because of this although there are many instances where permanent marking of glass is desirable, this is not effected because of the difficulty of the operation.

The object of the present invention is to provide a portable appliance for very quickly and easily permanently marking glass by abrasion in the manner set forth, which means can be used without danger of dispersal of the abrasive.

In accordance with the present invention there is provided a portable appliance comprising a spray gun having a spray nozzle, through which a stream of abrasive can be emitted, and extending into one end of a duct or casing at the opposite end of which a stencil or stencils is or/are located or adapted to be located, the spray nozzle of the gun being adapted to direct a stream of abrasive towards the stencil or stencils and being movable relatively to the duct or casing so that the centre of the stream of abrasive can be directed successively through different portions of the full width of the stencil or adjacent stencils located therein.

Preferably, the spray gun is turnable relatively to the duct or casing for the purpose specified.

Conveniently, the duct or casing progressively increases in cross-sectional size from a narrow end in which the spray nozzle is located to a wide end at which the stencil is or the stencils are located.

Advantageously, the stencil is or the stencils are detachable from the duct or casing.

It is primarily the intention that a finely-powdered abrasive material such as fine sand, carborundum or the like shall be sprayed on to the glass, i.e. blown on a stream of air, although it is possible that an emulsion, with such a powdered material in suspension in a liquid, might also be employed.

Thus, the spray gun, the duct or casing, and the stencil(s) may form a single portable appliance which can be quickly and easily applied to a glass surface and the gun operated to mark the surface to the form of the stencil(s).

The duct or casing, hereinafter referred to as a casing, will, of course, be air-tight, with the exception of the apertured stencil(s) at the wide end thereof, so that, with the stencil(s) applied to a sheet of glass the stream of

[*Price 4s. 6d.*]

abrasive material will be directed through the stencil(s) onto the glass and will abrade and permanently mark the latter in the areas of contact, i.e. to the form of the aperture(s) of the stencil(s).

Manifestly, it might be dangerous if the stream of abrasive material escaped from the spray gun or the duct, and the intention is that the abrasive shall not be allowed to escape but will contact the glass and return to the duct. To further ensure this, the stencil or stencils is or are advantageously surrounded at the side thereof which will contact the glass with a frame of resilient material, e.g. rubber, or a plastics material, which, when the stencil is applied to the glass, is compressed and forms an air-tight seal.

Now, as will be readily appreciated the present invention enables glass and the like to be very easily and quickly marked. Thus, with the stencil(s) of the appliance applied to a surface to be marked a short burst, e.g. of only a few seconds, of a stream of abrasive material will quickly and permanently mark the glass.

This simple method will not only enable all the various well known applications of permanent markings upon glass to be more quickly and easily effected than hitherto, but will enable glass to be marked in situations where this has not previously been possible or convenient in view of the difficulties attendant upon the conventional methods of marking glass.

For example, it has been realised that if one or more of the glass windows of a motor car or other vehicle were permanently and indelibly marked with the licence registration number of the vehicle or a similar means of identification, it would be extremely difficult, should the car or vehicle be stolen, to prevent subsequent identification of the vehicle. Assuming that the marking upon the window were indelible, the only method of avoiding identification of a stolen vehicle would be to replace the windows—a difficult and time-consuming task.

This idea has not previously been adopted because of the difficulty of efficiently marking the windows. However, the present invention has been primarily, although by no means exclusively, evolved for this purpose. Thus, with the appliance provided by the invention one or more or all of the windows of a motor car or other vehicle could be easily and quickly marked with an identification legend or symbol, for example by the garage supplying the car and the licence registration number plates. The legend or symbol marked on the windows could be the same as the licence registration number or could be a different identification symbol.

In any event, as will be appreciated where the appliance of the invention is used for this purpose the form of the legend or symbol of the stencil(s) must be capable of ready variation, e.g. the stencil(s) must be quickly removable and replaceable by another or others.

In order that the invention may be more clearly understood one specific constructional example thereof will now be described with reference to the accompanying drawings, wherein:—

Figure 1 is a part-sectional side elevation of the appliance,

Figure 2 is a partial plan view shown partly in section,

Figure 3 is a partial front view, and

Figure 4 is detail vertical sectional view on a larger scale than Figure 1 showing the frame, stencil holder and stencils.

Like parts are designated by similar reference characters throughout the drawings.

As will be seen in Figure 1, the appliance comprises a spray gun, indicated generally at 1, including an air jet 2 and a horizontally directed spray nozzle 3, an outwardly flared casing indicated generally at 4 detachable from the spray gun, means, indicated generally at 5, for mounting, at the front end of the casing 4, a stencil or stencils, a container 6 for containing finely powdered abrasive material and a flexible suction tube 7 connecting the container 6 with the nozzle 3 for supplying abrasive material to the latter.

The spray gun 1 includes an upwardly and forwardly inclined handle 8 and a forwardly and horizontally projecting part 9 which are formed with a continuous air passage therethrough. The handle 8 is formed for comfortable holding and includes a curved lug 10 defining a thumb recess. A union 11 is provided at the lower end of the air passage in the handle 8 whereby a flexible air hose, indicated in chain dotted lines at 12 in Figure 1, is connected to the air passage, the opposite end of the hose 12 being adapted to be connected to any appropriate source of compressed air. Located within the handle 8 is a normally closed valve (not shown) for controlling the flow of air through the said passage and adapted to be actuated by a plunger 13 which is resiliently biassed into an outer forward position in which the valve is closed but which can be depressed to a rear inner position by a finger to open the valve to allow air to flow out through the exit end of the passage at the leading end of the forwardly extending part 9.

To the leading end portion 9*a* of the forwardly projecting part 9 is applied a cylindrical component 14 having a central bore 14*a*. Thus, the end portion 9*a* is cylindrical and screw-threaded and the component 14 is formed with a counterbore at its rear end which is correspondingly screw-tapped for engagement with the portion 9*a*. A locknut 9*b* is provided for locking the component 14 in the appropriate orientation relatively to

the handle 8. The leading end portion of the component 14 is formed with a large counterbore 14*b* at the centre of which is located the aforesaid jet 2 formed with a central bore of the same size as the bore 14*a*. The component 14 is also formed with a short passage 14*c*, extending parallel to the bore 14*a*, which communicates at one end with the counterbore 14*b* and at the other end communicates with a screw-tapped radial hole in which is fitted a nipple to which the upper end of the flexible tube 7 is connected. The leading end portion of the component 14 is also externally rebated and fits within a socket formed at the rear of a block 15.

The block 15 is, as will be seen from Figure 2, part circular in plan and is of constant height and formed with a horizontal ~~diameter~~ bore 15*a* extending therethrough. The rear end portion of the block is formed with a counterbore constituting the aforesaid socket for receiving the leading end of the component 14. A stepped cylindrical rubber sleeve 16 is provided which comprises a large portion 16*a* fitting within the socket of the block 15 and a similar integral portion 16*b* fitting within the bore 15*a* of the block 15. The portion 16*b* in fact constitutes the aforesaid nozzle 3 and its bore 16*c* is accordingly tapered, i.e. progressively decreases in cross-section forwardly.

Thus, with the appliance in use a stream of air issues from the jet 2 and flows through the nozzle 3 and creates a vacuum in the tube 7 whereby powdered abrasive is drawn up the latter and is picked up by the air-stream and issues through the nozzle as a finely divided stream. Thus, the counterbore 14*b* and the bores in the portions 16*a* and 16*b* of the sleeve 16 together constitute a mixing chamber in which air is mixed with powdered abrasive.

The component 14 and the block 15 are secured together by means of two horizontal axially aligned screws 17 (Figure 2) engaging correspondingly tapped holes in the leading end portion of the component 14, the rear extremities of the opposite sides of the block 15 being recessed to facilitate insertion and removal of the screws 17.

The casing 4 is of rectangular cross-section having a plane top 18, a plane bottom 19 and complementary sides 20, and is of constant height but progressively increases in width from its rear end towards its forward end which is of oblong shape, i.e. of substantial width, as clearly shown in Figure 3. The casing 4 is initially open at both the front and rear ends, but is, of course, closed at the rear end by the block 15 associated with the spray gun.

The inner faces 20*a* of the rear extremities of the side walls 20 of the casing 4 conform to the curvature of, and provide a seat for, the block 15 which is secured in position in contact with the seat by two axially-aligned vertical pivot screws 21 (Figure 1) entering holes in the top 18 and bottom 19 of the casing 4 and the conical ends of which engage in complementary seats in the upper and lower faces of the block 15. The common axis of the screws 21 is located at the centre of curvature of the block 15 whereby the gun including the component 14 and the block 15, can be turned in opposite directions as indicated by the arrows in Figure 2, relatively to the casing 4. It is to be noted that the length of the arrows is not indicative of the degree of relative turning movement. A rectangular seal 22 (Figure 2) of rubber or like resilient material is recessed into the rear extremities of the side walls 20 and the associated portions of the top 18 and bottom 19 of the casing 4 and provides an air-tight seal between the casing 4 and the block 15. Extending horizontally from, and rigid with, one of the side walls 20 of the casing is a handle 23.

The bottom 19 of the casing includes two portions 19*a* extending in the same plane as the major portion of the bottom outside the confines of the side walls 20 of the casing. The bottom is formed with an integral downwardly-depending circular flange 19*b* and also with an aperture 19*c* located within the confines of the flange and the side walls 20 of the casing 4. To the flange 19*b* is secured, by means of an annular band 24, the ends of which are adapted to be closed by a screw 25, the upper end portion of a bag of canvas or like impermeable material constituting the container 6. The lower end of the suction tube 7 is connected to the wall of the container 6 adjacent the closed bottom thereof by means of a detachable union 26.

Secured by any appropriate means to the front of the casing 4 is an oblong frame 27, of rubber or a plastics material or other resilient material of substantially the same dimensions as the front face defining the open front of the casing 4. The aperture bounded by this frame is very slightly wider, i.e. deeper, than the frontal opening of the casing. Detachably located within the frame 27 is a stencil holder 28 in the form of an elongated plate the upper and lower longitudinal marginal edge portions of which are turned over to define upper and lower narrow channels. The length and width of the plate 28 is very slightly greater than the initial size of the aperture defined by the frame 27 so that the plate 28 is a force fit within the latter and is resiliently and detachably held thereby.

Those portions 29 of the edges defining the frontal opening in the casing which overlap the aperture defined by the frame 27 locate the rear faces of the turned-over edges of the plate 28.

Moreover, the thickness of the plate includ-

ing the rolled-over edges thereof corresponds to the thickness of the frame 27 so that the front face of the plate 28 is located almost flush with but a little inwardly of the front face of the frame 27.

The plate 28 is formed with a centrally disposed oblong aperture 28*a*. A plurality of stencils 30 and spacer plates 31 are fitted into the holder 28. Each of the stencils 30 comprises a small appropriately apertured rectangular metal plate of a size which just fits with the height of the holder 28. That is to say, as will be seen from Figures 1 and 3, each of these plates 30, 31 is of a height corresponding to the distance between the turned-over upper and lower edges of the plate 28, the upper and lower edges of the plates 30, 31 being located and held within the channels defined thereby.

Where the appliance of this example is intended for marking the windows of motor cars and like vehicles, the stencils will, of course, be apertured to the form of letters and/or numerals, as shown in Figure 3. As will be readily appreciated the combination of numbers and/or letters presented by the stencils may be very easily changed by removing the frame from the duct or casing and substituting for one or more of the stencils a different stencil or stencils.

A plurality of stencils 30 and spacer plates 31 are provided with the appliance for selective mounting within the stencil holder 28.

The top 18 of the casing is formed with a rectangular aperture 18*a* which is closed by a window constituted by a sheet of transparent material such as perspex 32 located within a frame 33 detachably retained in position by means of two pivotal catches 34 secured to the top 18 by screws 35.

In use, the appliance will be held in both hands, one hand holding the handle 8 of the spray gun and the other hand holding the handle 23. The appliance will be located with the front faces of the frame 27 and the stencils 30 applied to, and positively held in contact with, a glass or like surface to be marked, so compressing the frame 27 bounding the stencils 30 and bringing the latter into contact with the glass surface and at the same time forming an airtight seal in contact with the surface and bounding the stencils. The flexible nature of the container 6 and the tube 7 allows the appliance to be located even where there is some obstruction immediately below the location of the surface to be marked.

The spray gun is then operated by depression of the plunger 13 so that a stream of abrasive material issues from the nozzle 3 and is directed towards and through the stencils; the spray gun, with the component 14 and the block 15, being turned relatively to the casing about the axis of the screws 21, by manipulation of the handle 8 to opposite sides of the position depicted in Figure 2, so that the full intensity of the centre of the stream of abrasive material is applied successively to the adjacent stencils. The window 32 enables the precise disposition of the stream of abrasive to be observed. Thus, the surface to which the stencils is applied is marked, i.e. abraded, to the form of the apertures in the stencils with an even intensity.

The abrasive material which has been directed towards and through the stencils 30 onto the portions of the surface to be marked is prevented from escaping by the air-tight seal constituted by the frame 27 and after impinging upon and marking the surface falls through the aperture 19*c* in the bottom 19 of the casing 4 and returns to the container 6 for re-circulation. Thus, none of the abrasive is dispersed.

Although it is primarily the intention that the appliance shall be used in the illustrated disposition, that is to say with the stream of abrasive directed horizontally on to a vertical surface to be marked, there is no limitation in this respect and the appliance may be used in any other orientation for marking horizontal or otherwise disposed surfaces.

Manifestly, the present invention provides a method and means of simply and quickly permanently marking glass and the like. As will be appreciated the construction of the means may be varied within the purview of the invention.

WHAT I CLAIM IS:—

1. A portable appliance comprising a spray gun having a spray nozzle, through which a stream of abrasive can be emitted, and extending into one end of a duct or casing at the opposite end of which a stencil or stencils is or/are located or adapted to be located, the spray nozzle of the gun being adapted to direct a stream of abrasive towards the stencil or stencils and being movable relatively to the duct or casing so that the centre of the stream of abrasive can be directed successively through different portions of the full width of the stencil or adjacent stencils located therein.

2. An appliance according to Claim 1, wherein the spray gun is turnable relatively to the duct or casing for the purpose specified.

3. An appliance according to Claim 1 or 2, wherein the said duct or casing progressively increases in cross-sectional size from a narrow end in which the spray nozzle is located to a wide end at which the stencil is or the stencils are located.

4. An appliance according to Claim 1, 2 or 3, wherein the stencil is or the stencils are detachable from the duct or casing.

5. An appliance according to Claim 3 or 4, wherein a frame of resilient material is provided at the wide end of the duct or casing and surrounds the stencil or stencils at the

ing the rolled-over edges thereof corresponds to the thickness of the frame 27 so that the front face of the plate 28 is located almost flush with but a little inwardly of the front face of the frame 27.

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1. A portable appliance comprising a spray gun having a spray nozzle, through which a stream of abrasive can be emitted, and extending into one end of a duct or casing at the opposite end of which a stencil or stencils is or/are located or adapted to be located, the spray nozzle of the gun being adapted to direct a stream of abrasive towards the stencil or stencils and being movable relatively to the duct or casing so that the centre of the stream of abrasive can be directed successively through different portions of the full width of the stencil or adjacent stencils located therein.

2. An appliance according to Claim 1, wherein the spray gun is turnable relatively to the duct or casing for the purpose specified.

3. An appliance according to Claim 1 or 2, wherein the said duct or casing progressively increases in cross-sectional size from a narrow end in which the spray nozzle is located to a wide end at which the stencil is or the stencils are located.

4. An appliance according to Claim 1, 2 or 3, wherein the stencil is or the stencils are detachable from the duct or casing.

5. An appliance according to Claim 3 or 4, wherein a frame of resilient material is provided at the wide end of the duct or casing and surrounds the stencil or stencils at the

side or sides thereof which is or are to contact the surface to be marked, the arrangement being such that the frame is compressed when the appliance is applied to a surface to be marked and forms an air-tight seal surrounding the stencil or stencils.

6. An appliance according to any of Claims 1 to 5, wherein the spray gun includes an air jet associated with the spray nozzle and the appliance includes a container, for containing a supply of abrasive, which is suspended below the duct or casing and is in communication with the latter, and a suction tube connected between the container and the spray nozzle suchwise that, when the spray gun is supplied with air under pressure, abrasive is drawn along the said tube and is picked up by the air stream and issues through the nozzle as a finely divided stream of abrasive.

7. An appliance according to Claim 4, wherein the spray gun has a handle with which is associated a normally closed valve for controlling the flow of air through the jet, this valve being adapted to be actuated by a plunger.

8. An appliance according to Claims 3 and 4, wherein the single stencil is or the plurality of stencils are adapted to be located in a holder which is mounted at the wide end of the duct or casing and fits within the aforesaid resilient frame so as to be detachably held thereby.

9. An appliance according to any of the preceding claims, wherein the casing is of rectangular cross-section.

10. An appliance substantially as herein described with reference to the accompanying drawings.

11. Articles of glass or other material, a surface of which has been marked by the appliance claimed in any of Claims 1 to 10.

12. A motor vehicle, the windows of which have been marked, by the use of the appliance claimed in any of Claims 1 to 10, with the licence registration number of the vehicle or a similar identification marking.

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