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(54) **Masking apparatus**

(57) A masking device (10) is held in one hand by a handle (12) such that a rivet (22) extends through an

opening (18) of the masking device (10). With the other hand, a user coats the rivet (22) with a sponge, pad or spray applicator.

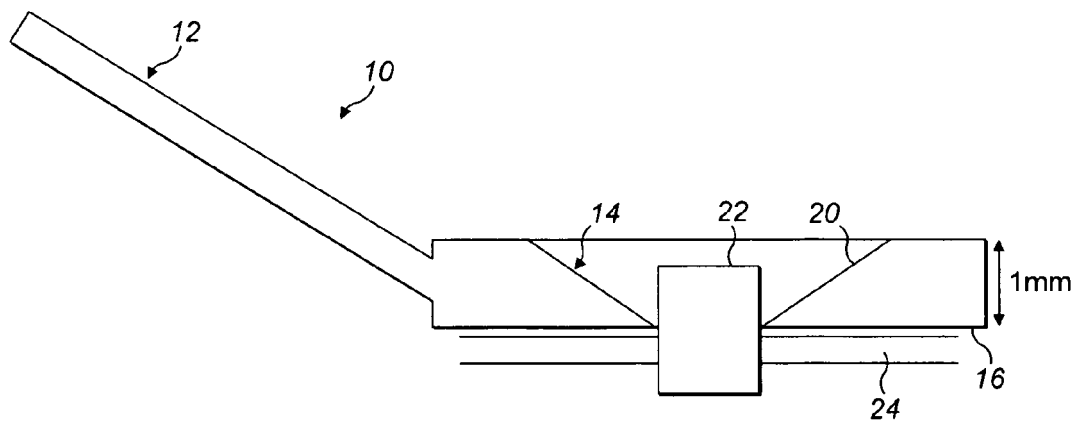


FIG. 1

Description

[0001] The present invention relates to a masking device and a method of masking.

[0002] Aircraft skins have many fasteners such as nuts or rivets over the surface. These require to be painted in order to protect them from the harsh environment that they exist in. The way that the fasteners are painted is by hand. Frequently not all of the fastener is covered and more frequently more area than the fastener is covered. This gives rise to an ugly appearance of the painted fastener. Furthermore, painting each fastener is extremely time consuming.

[0003] US 6569248, US 4628858, WO 89/09862, DE 3615741, FR 783924, US 2002/0037392, US 5302205, CN 101844123, GB 2465033, US 2009/0090791 relate to marking devices or similar.

[0004] It is an object of the present invention to attempt to overcome at least one of the above or other disadvantages.

[0005] According to one aspect of the present invention a masking device includes a masking region including an opening arranged, in use, to be located over a portion to be coated.

[0006] The masking region may include a surface that extends upwardly and outwardly away from the opening.

[0007] The masking region may include a base arranged, in use, to be located against a surface of an article which is the portion to be coated.

[0008] The base may comprise a downwardly projecting rim inside of which is defined the opening.

[0009] Another surface of the masking region may include an upwardly extending barrier surrounding the opening. The barrier may extend upwardly from an upwardly facing surface of the masking region that surrounds the opening and may comprise a rim that extends inwardly from the barrier at a location spaced from the upwardly facing surface of the masking region.

[0010] The opening may be enclosed.

[0011] The opening may be circular or non-circular.

[0012] The device may include a handle which may extend upwardly away from the masking region and which may extend outwardly from the masking region. The handle may be detachable from the masking region.

[0013] Part of the masking region may be removable whereby the peripheral extent of at least one side of the masking region is reduced and the part that is removable may be arranged to be broken off. The break may be arranged to be along a weakened line. Alternatively a part may be removed such as by cutting.

[0014] The masking region may be of plastics material.

[0015] The portion that is to be coated may be arranged to extend upwardly, through the opening.

[0016] According to a further aspect of the present invention a method of coating a region includes locating an opening of the masking region of a masking device over a part of a portion that is to be coated and coating the portion.

[0017] The method may comprise locating the opening over a part of the portion that is to be coated with at least part of the portion that is to be coated extending upwardly through the opening.

[0018] The method may comprise applying the coating through a surface of the masking region that extends upwardly and outwardly from the opening.

[0019] The method may comprise locating a downwardly projecting rim around a portion that is to be located against the surface of an article to be coated

[0020] The method may comprise inhibiting the coating from leaving the upper surface region of the masking device by including a barrier around the masking device.

[0021] The method may comprise locating the masking region by means of a handle of the masking device.

[0022] The method may comprise locating the masking region with one hand of a user and effecting the coating with the other hand of the user.

[0023] The method may comprise removing a part of the masking region in order to allow the masking region to be correctly located in a tight space.

[0024] The method may comprise making the opening larger than the optimum portion that is to be coated.

[0025] The method may comprise coating a fastener which may be a rivet.

[0026] The present invention includes any combination of the herein referred to features.

[0027] The present invention can be carried into practice in various ways but several embodiments will now be described, by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a cross section through a masking device 10;

Figure 2 is a plan view of Figure 1;

Figure 3 is a plan view of a masking device 10a;

Figures 4, 5 and 6 are cross sectional views of modifications that can be made to the masking device 10;

Figures 7 and 8 are plan views of an alternative masking device;

Figures 9 and 10 are plan views of a further alternative masking device, and

Figure 11 is a plan view of a modified masking device.

[0028] As shown in Figures 1 and 2, a masking device 10 includes a handle 12 and a masking region 14. The masking region 14 includes a base 16 and an opening 18 which opening 18 may be a complete enclosure. The opening 18 diverges upwardly and outwardly away from the base to form a countersunk portion 20.

[0029] The handle 12 extends upwardly and outwardly

to one side of the base 16. In use, the operative, with one hand, will bring the opening 18 over a fastener feeling such as a nut or rivet 22 with the base 16 resting on, for instance, an aircraft skin 24. With the other hand the operative will then apply a coat such as by painting the fastener such as, for example, by using a sponge, pad or spray applicator to cover the top and sides of the fastener 22. Whilst the specification refers to an upwardly and top etc, it will be appreciated that the masking could be applied to an outwardly or a downwardly facing surface to be coated.

[0030] The opening 18 may be substantially the same diameter as the fastener 22 or may be larger. When the opening 18 is larger than the diameter of the fastener 22, paint from the applicator may not only cover the exposed portion of the fastener 22 but may also cover a small region of the skin surrounding the fastener 22. The height from the base 16 to a top surface 30 may vary as may the area of the openings 18 or 18a.

[0031] Figure 3 shows an opening 18a that is hexagonal in shape in order to enable fasteners having that shape to be coated or painted. Other features of Figure 3 can be those referred to above in relation to Figures 1 and 2.

[0032] Figures 4, 5 and 6 are modifications that can be made to the masking region.

[0033] In Figure 1, the lower part of the countersunk portion 20 that defines the opening 18 terminates in a sharp edge. In Figure 4 that sharp edge is removed by having a rounded or vertically extending surface 26.

[0034] The base 16 in Figure 1 is shown as being flat and resting over its complete surface against the aircraft skin 24. It is possible that paint may leak outwardly between the skin and the base 16 such that, when several rivets are coated in succession the skin 24 will have paint inadvertently applied to regions where paint is not desired. Consequently, in Figure 5 the opening 18 includes a downwardly extending rim or spacer 28 such that the flat base 16 will be held clear of the aircraft skin. The spacer may be a continuous rim or may comprise discrete spacers adjacent to the opening.

[0035] Coating may also accumulate on the top surface 30 of the masking region. This coating may flow over the masking region and onto the skin again applying a coating where this is not required. To alleviate this problem an upwardly extending peripheral rim 32 may be provided. The problem may be still further alleviated by the rim 32 including a peripheral rib 34 extending inwardly from the upper portion of the rim 32 with the rib 34 being spaced from the top surface 30.

[0036] The masking device can be made out of any suitable material. For instance, the masking device could be of plastics material and may be integrally moulded out of high density polyethylene which may be coated with fluorinate in order to assist cleansing. When the masking region is made from plastics or other suitable material, parts of the masking region may be broken off if those parts would otherwise abut a protrusion on the aircraft

skin that otherwise would not permit the location of the opening over the fastener. To assist in the breaking off of this part or parts, weakening lines may be provided in the masking region to assist in the accurate breaking off of the desired part. Alternatively, the masking region or the handle or both parts may comprise a metal portion.

[0037] The handle 12 may be detachably connected to the masking region such as, for instance, by incorporating a screw thread and threaded recess or by a push-fit of a protrusion into a tight recess.

[0038] The modifications shown in Figures 7 to 11 all operate in the same way as previously described and may line any of the modifications previously described.

[0039] Figure 7 shows a masking region 14 formed with a series of concentric weakened or perforated lines 14A. The inner part from any concentric line can be detached such as by punching the inner part out to give an opening 18 of the derived diameter.

[0040] The present invention is not limited to the opening being circular and any shaped opening is envisaged.

[0041] The embodiment of Figures 7 and 8 may be made of plastic at least in the region of the masking region 14.

[0042] Figures 9 and 10 show an alternative embodiment in which the diameter of the opening 18 can be reduced by adding one or more discs 36. Discs may be arranged to engage with the internal diameter or formation of the region 14 such as by being a friction fit or by cooperating threads. The discs may have a different internal diameter. The discs 36 may be metal. They may be disposable or alternatively or additionally, may be able to be removed and reattached. For example they may be removed for cleaning.

[0043] Figure 11 is a plan view of a masking device in which the opening 18 is not a complete enclosure. Instead the opening 18 has spaced ends 38. The spaced ends may effect an opening of that is enclose b less than half by half or more than half, as shown. In the example shown more than 180° is enclosed such as 200°. figure 11 may have any of the modifications previously described including the modifications shown in Figures 7 and 8 or 9 and 10.

[0044] Whilst the present invention has been described in relation to masking fasteners on aircraft skins, it will be appreciated that the device could be used to mask any region that is to be covered.

[0045] Attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0046] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0047] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0048] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A masking device including a masking region including an opening arranged, in use, to be located over part of a portion to be coated,
Characterised in that a portion that is arranged to be coated is arranged, in use to extend upwardly through the opening. 20
2. A device as claimed in claim 1 in which the masking region includes a surface that extends upwardly and outwardly away from the opening. 25
3. A device as claimed in claims 1 or 2 in which the masking region includes a base arranged, in use, to be located against a surface of an article which has the portion to be coated. 30
4. A device as claimed in claim 3 in which the base comprises a downwardly projecting rim inside of which is defined the opening. 35
5. A device as claimed in any preceding claim in which an upper surface of the masking region includes an upwardly extending barrier surrounding the opening. 40
6. A device as claimed in any preceding claim in which the opening is enclosed. 45
7. A device as claimed in any of claims 1 to 6 in which the opening is non-circular. 50
8. A device as claimed in any preceding claim including a handle. 50
9. A device as claimed in any preceding claim in which at least one part of the masking region is removable.
10. A device as claimed in any preceding claim including an insert arranged to be located in the masking region and when relocated the size of the opening is reduced. 55

11. A device as claimed in any preceding claim in combination with a portion to be coated.
12. A method of coating a region including locating an opening of a masking region of a masking device over a part of a portion that is to be coated and coating the portion,
characterised in that at least a part of the portion that is to be coated is caused to extend up through the opening.
13. A method as claimed in claim 12 comprising locating a downwardly projecting spacer around a portion that is to be located against the surface of an article to be coated.
14. A method as claimed in claim 12 or 13 comprising inhibiting the coating from leaving the upper surface region of the masking device by including a barrier around the masking device.
15. A method of coating as claimed in any of claims 12 to 14 when using a masking device as claimed in any of claims 1 to 11.

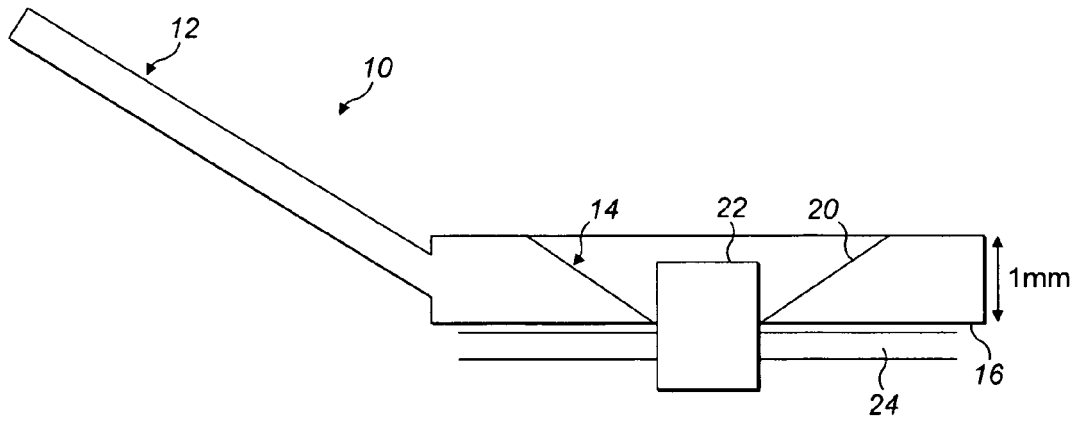


FIG. 1

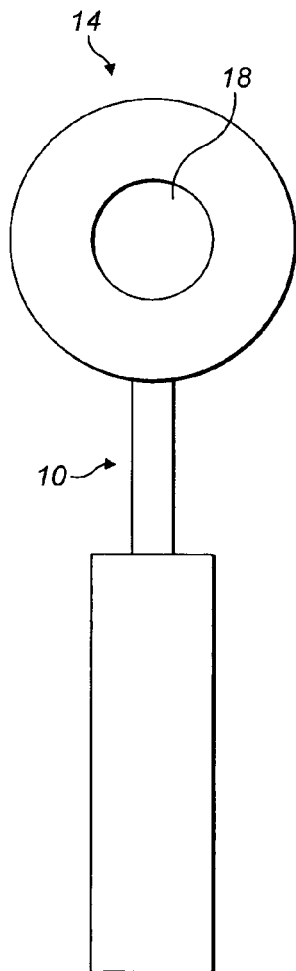


FIG. 2

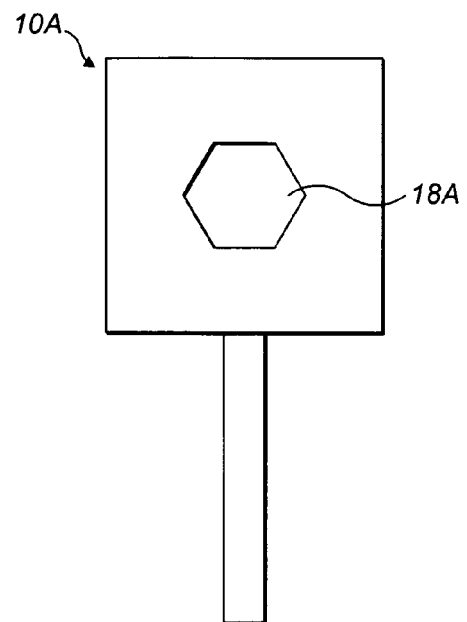


FIG. 3

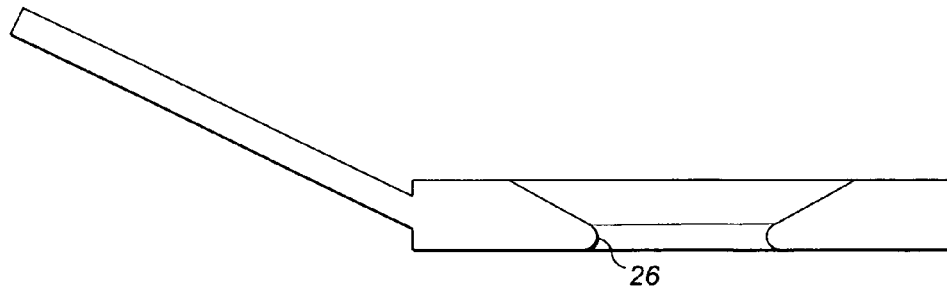


FIG. 4

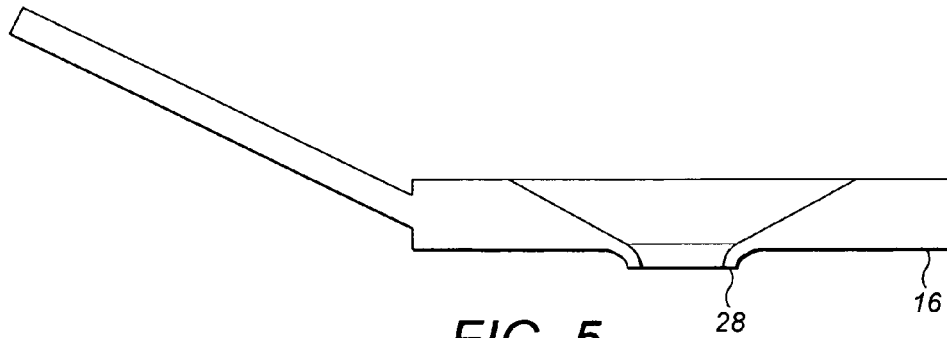


FIG. 5

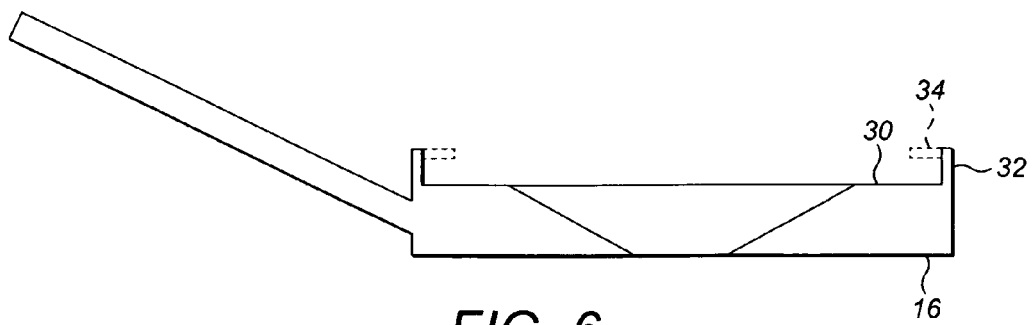


FIG. 6

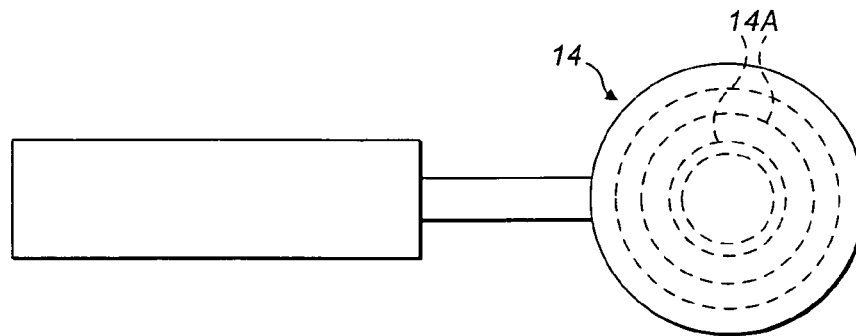


FIG. 7

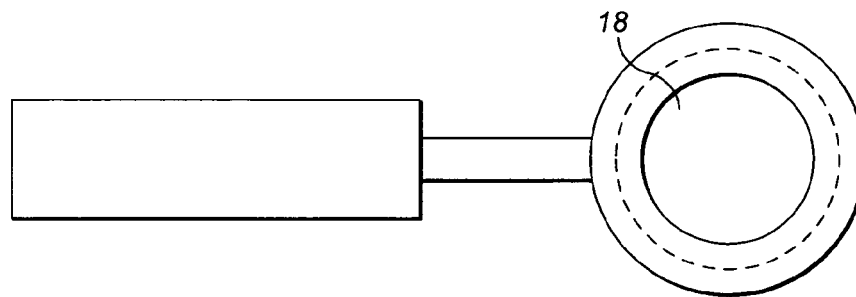


FIG. 8

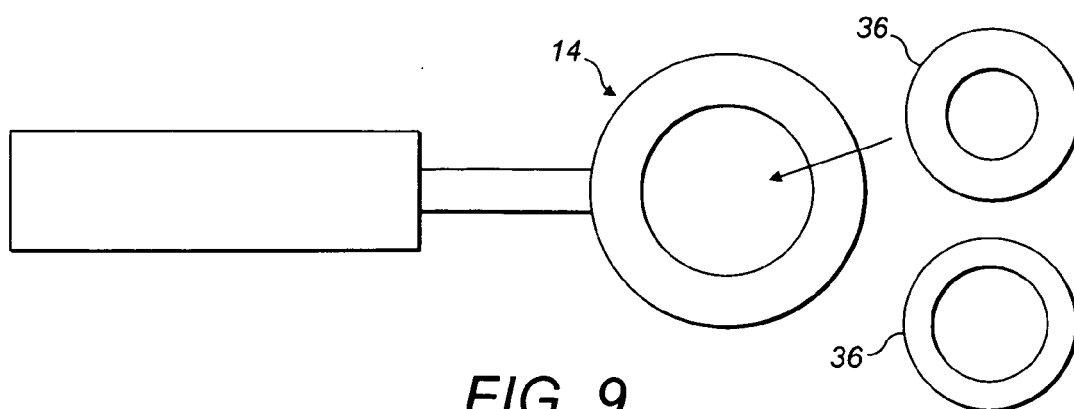


FIG. 9

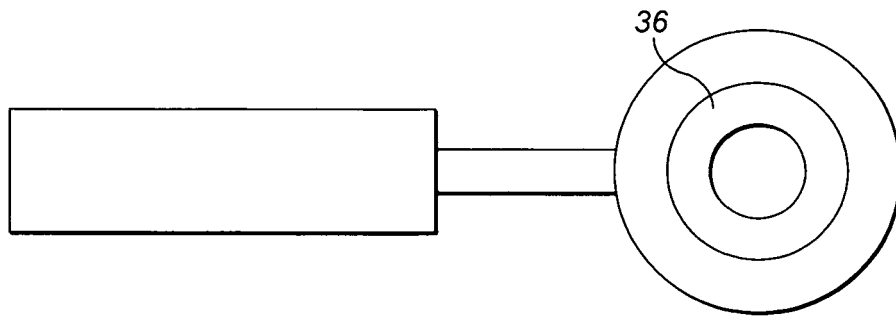


FIG. 10

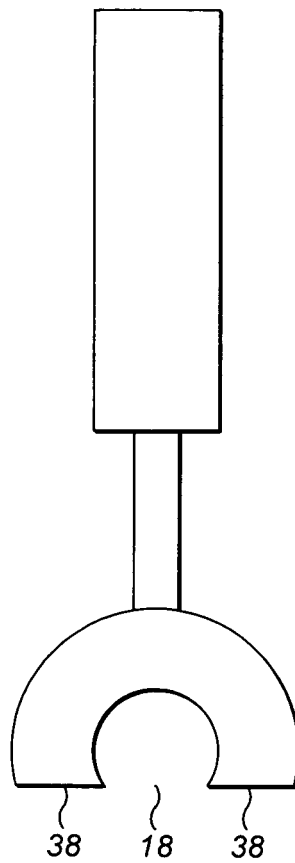


FIG. 11



EUROPEAN SEARCH REPORT

Application Number
EP 12 19 6783

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Place of search Munich		Date of completion of the search 22 April 2013	Examiner Endrizzi, Silvio
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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