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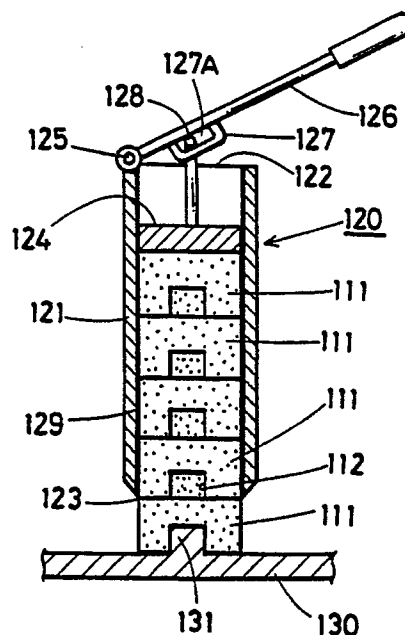
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54 **A masking tool and a masking method.**

57 A masking tool employed to protect the projection(s) of an article such as a car body from a surface treatment and a masking method employing said masking tool are provided in the present invention. Said masking member comprises a cylinder having an inlet at one end and an outlet at the other end, a plural number of cap or clip type masking members and being put in said cylinder to be placed one upon another, and a transporting means arranged in said cylinder to transport said masking members successively from the inlet to the outlet of said cylinder to put said masking members over said projection(s) of said article.

Fig.1



EP 0 400 667 A2

A MASKING TOOL AND A MASKING METHOD

BACKGROUND OF THE INVENTION

The present invention relates to a masking tool employed to protect the projection(s) of an article such as a car body from a surface treatment such as coating, plating, vacuum evaporation, phosphatizing, and the like.

Further, the present invention relates to a masking method employing said masking tool to protect said projection(s) of said article from said surface treatment.

More particularly, the present invention relates to a masking member which comprises a cylinder having an inlet at one end and an outlet at the other end, a plural number of cap or clip type masking members and these being put in said cylinder to be placed one upon another, and a transporting means arranged in said cylinder to transport said masking members successively from the inlet to the outlet of said cylinder.

To protect the projection(s) of said article, said masking members in said cylinder of said masking tool are successively transported from the inlet to the outlet of said cylinder by said transporting means and said masking members are successively put over said projections of said article before said surface treatment.

When a surface treatment is effected on the surface of article, and if said article has projection(s) on which said surface treatment should not be effected, said projection(s) of said article should be protected by putting a cap or clip type masking member(s) over said projection(s) before said surface treatment. In the case of the under side of a car body, said projection(s) may be bolt rod(s), boss(es), panel edge(s) and the like, and a paint such as a polyvinylchloride-sol, a tar-urethane mixture and the like is coated on said underside of said car body for corrosion, sound, and vibration proofing.

In a case of the surface treatment of the article having many projections, such as the coating of the under side of a car body as above described, many masking members should be put over said projections before said surface treatment. Further, in the case of a continuous mass-production line, said masking members should be put over said projections in a short time. Still further, in a case of a continuous mass-production line, it is desirable that said masking members be automatically put over said projections.

DESCRIPTION OF THE PRIOR ART

Hitherto, a cap or clip type masking member has been provided to protect the projection(s) of an article. Said masking member is made of a foamed plastic such as a foamed polystyrene and the like (USSN 276,407).

Nevertheless, said masking member(s) is(are) put over said projection(s) of said article by hand and much labor and time have been necessary to protect said projection(s) before said surface treatment.

SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to save labor and time in the case of a masking process before a surface treatment.

Another object of the present invention is to provide a masking method suitable for automatic operation.

A further object of the present invention is to provide a masking method suitable for a continuous mass-production line. According to the present invention, there is provided a masking tool employed to protect the projection(s) of an article from a surface treatment, which comprises a cylinder having an inlet at one end and an outlet at the other end thereof, a plural number of masking members which are put over said projections and are put in said cylinder to be placed one upon another, and a transporting means arranged in said cylinder to transport said masking member from the inlet to the outlet of said cylinder and a masking method for the projection(s) of an article by employing a masking tool which comprises transporting said masking members in said cylinder from the inlet to the outlet thereof by said transporting means, and putting said masking members over the projection(s) of an article one by one.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 to FIG. 4 relate to a first embodiment of the present invention.

FIG. 1 is a side sectional view of a masking tool.

FIG. 2 is a perspective view of a masking member.

FIG. 3 is a side sectional view of the projection of an article over which said masking member is put.

FIG. 4 is a side sectional view of the projection of an article after a coating.

FIG. 5 relates to a second embodiment of the present invention and a side sectional view of a masking tool.

FIG. 6 and FIG. 7 relate to a third embodiment of the present invention.

FIG. 6 is a perspective view of a masking member.

FIG. 7 is a side sectional view of the projection of an article over which said masking member is put.

DETAILED DESCRIPTION

FIG. 1 to FIG. 4 relate to a first embodiment of the present invention. Referring now to FIG. 1 to FIG. 4, a masking tool(120) comprises a cylinder(121) having an inlet(122) at one end and an outlet(123) at the other end, a friction sheet(129) attached to the inside of said cylinder (121), a plural number of cap type masking members(111) put in said cylinder(121) to be placed one upon another, and a piston(124) as a transporting means. Said piston(124) is inserted into said cylinder(121) from said inlet(122) thereof and a handle(126) is connected to the piston rod(124A) of said piston wherein a pin(128) of said piston rod(124A) is inserted in a groove(127A) of a bracket(127) of said handle(126).

As shown in FIG. 2, each masking member(111) has an inserting hole(112) and is made of a material, such as of plastics or a rubber such as polystyrene, polyethylene, polypropylene, ethylene-propylene copolymer, polyvinylchloride, polyvinylidene chloride, polymethacrylate, styrene-butadiene copolymer, acrylonitrile-butadiene copolymer, polybutadiene polyisoprene, polyisobutylene, polychloroprene, isoprene-isobutylene copolymer, natural rubber, polyurethane, melamine resin, urea resin, phenol resin, epoxy resin and the like; foams of said plastics or said rubber; mixture of said plastics of said rubber with a filler such as a calcium carbonate, a talc, a bentonite, a fly ash, a blast furnace slag, and the like; a fiber material such as a thermoplastic resin - impregnated fiber; a thermosetting resin - impregnated fiber; wooden material such as wood, hardboard, plywood and the like; metal material and the like; composite material consisting of a plural number of materials selected from the group of said materials.

A plural number of said masking members(111) are placed one upon another as above described and if desired, said masking members(111) be attached respectively by an adhesive or by melting.

A plural number of said masking members(111) in said cylinder(121) of said masking tool(120) are successively transported from the inlet-

(122) to the outlet(123) by operation of said piston(124) by said handle(126) and said masking members(111) are put over cylindrical projections(131) of an article(130) one by one as shown in FIG. 3 and after this, a paint such as a polyvinylchloride-sol, an urethane resin, an asphalt, a rubber-asphalt mixture, a tar-urethane mixture and the like is coated on the surface of said article to form a coating layer(140) as shown in FIG. 3. After coating, said masking member(111) is removed from said projection(131) as shown in FIG. 4, said coating layer(140) is not formed on said projection(131).

If desired, said masking tool(120) be operated by a robot and in this case, said masking members(111) are automatically put over said projection(s)(131) without the necessity of a laborer's hands.

Further, said piston(124) may be operated by a pressure oil cylinder, an electromagnetic cylinder, and the like instead of said handle(126).

FIG. 5 relates to a second embodiment of the present invention. A masking tool(220) of this embodiment comprises a cylinder(221) having an inlet(222) at one end and an outlet(223) at the other end, a plural number of cap type masking members(111) are put into said cylinder(221) to be placed one upon another, and a pair of endless belts(224),(224) act as a transporting means. Each of said endless belts(224),(224) is suspended on a pair of rollers(225),(226) wherein one set of said rollers(225) is rotatively attached to the inlet(222) of said cylinder(221) and the other set of said rollers(226) are rotatively attached to the outlet(223) of said cylinder(221). Said endless belts (224),(224) are respectively made of a friction material such as a rubber, or cloth having a flocking layer and the like, and said masking members(111) are pressed between said pair of endless belts(224),(224) in said cylinder(221) of said masking tool(220).

A plural number of said masking members(111) are successively transported from the inlet(222) to the outlet (223) in said cylinder(221) by driving said rollers(225), (226) by a driving means such as a motor and the like to put said masking members(111) over the projection(s) of an article one by one.

FIG. 6 and FIG. 7 relate to a third embodiment of the present invention. A clip type masking member(211) of this embodiment has a inserting ditch(212) and a plural number of said masking members(211) are put into said masking tool(120) or (220) as same as said masking members(111) of the first and second embodiments. Said masking member(211) is put over a flat type projection(231) of an article(230) to protect said projection(231) from a surface treatment.

Claims

1. A masking tool employed to protect the projection(s) of an article from a surface treatment, which comprises a cylinder having an inlet at one end and an outlet at the other end thereof, a plural number of masking members which are put over said projections and are put in said cylinder to be placed one upon another, and a transporting means arranged in said cylinder to transport said masking member from the inlet to the outlet of said cylinder.

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2. A masking tool in accordance with Claim 1, wherein said masking members are respectively cap type masking members having a inserting hole(s).

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3. A masking tool in accordance with Claim 1 or 2, wherein said masking members are respectively clip type masking members having inserting ditch(es).

4. A masking tool in accordance with Claim 1, 2 or 3, wherein said transporting means comprises a piston arranged on the inlet of said cylinder.

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5. A masking tool in accordance with any one of Claims 1 to 4, wherein said transporting means comprises a pair of endless belts each of which is suspended on a pair of rollers rotatively attached on both ends of said cylinder and said masking members are pressed between said pair of endless belts in said cylinder.

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6. A masking method for the projection(s) of an article by employing a masking tool in accordance with any one of Claims 1 to 5, which comprises transporting said masking members in said cylinder from the inlet to the outlet thereof by said transporting means, and putting said masking members over projection(s) of an article one by one.

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7. A masking method in accordance with Claim 6, wherein said masking tool is operated by a robot.

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8. A masking method in accordance with Claim 6 or 7, wherein said transporting means comprises a piston arranged on the inlet of said cylinder.

9. A masking method in accordance with Claim 6, 7 or 8, wherein said transporting means comprises a pair of endless belts each of which is suspended on a pair of rollers.

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Fig. 1

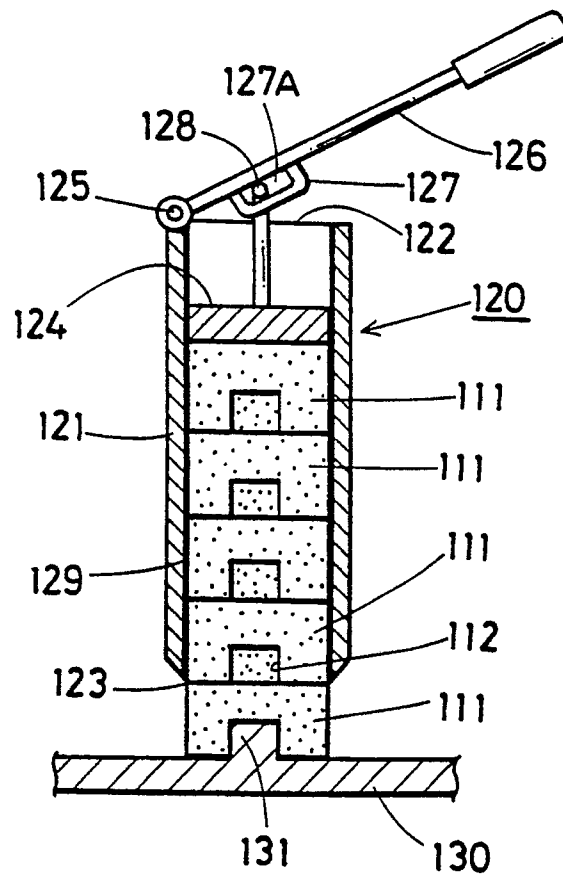


Fig. 2

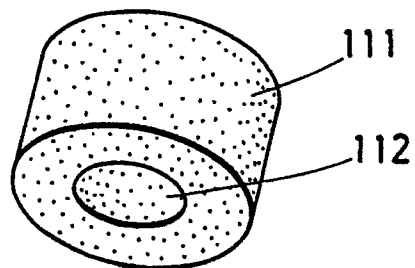


Fig. 3

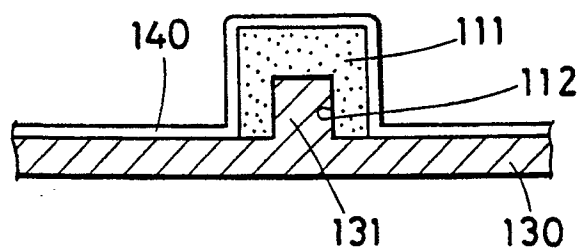


Fig. 4

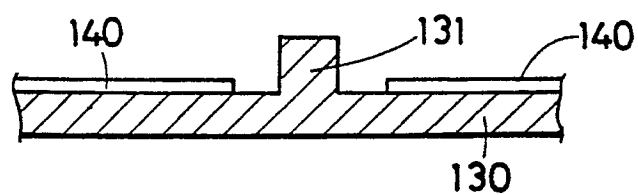


Fig. 5

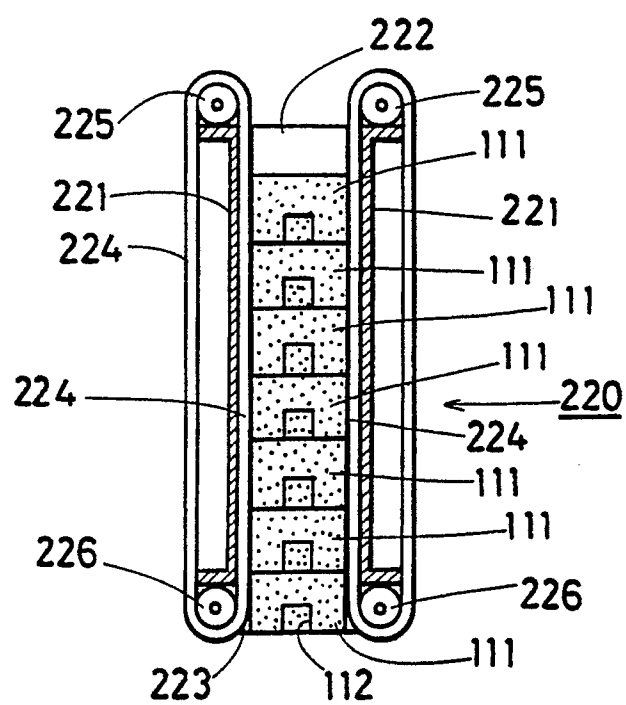


Fig. 6

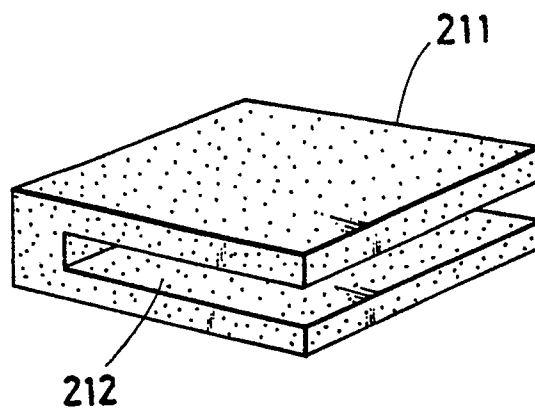


Fig. 7

