June 18, 1957 W. S. BANZHOF, JR 2,796,041

MASKING UNIT FOR SPRAYING MACHINES

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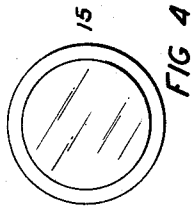


FIG 4

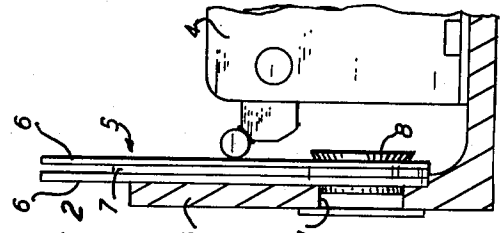


FIG 2

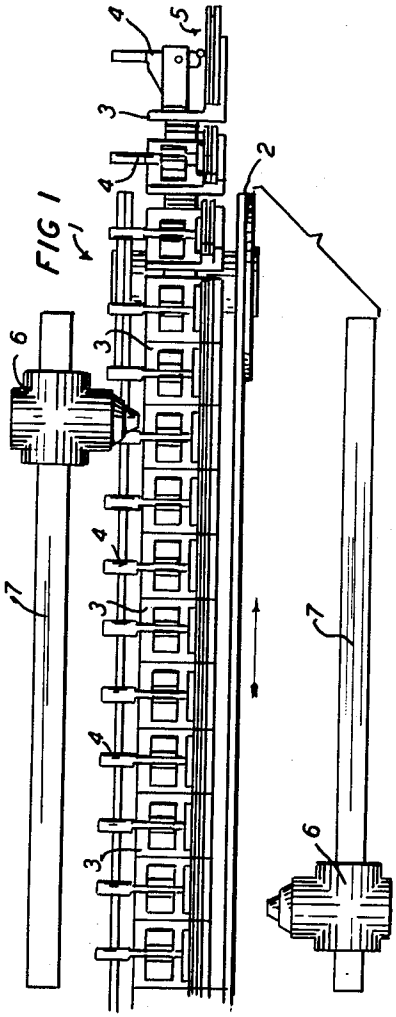


FIG 1

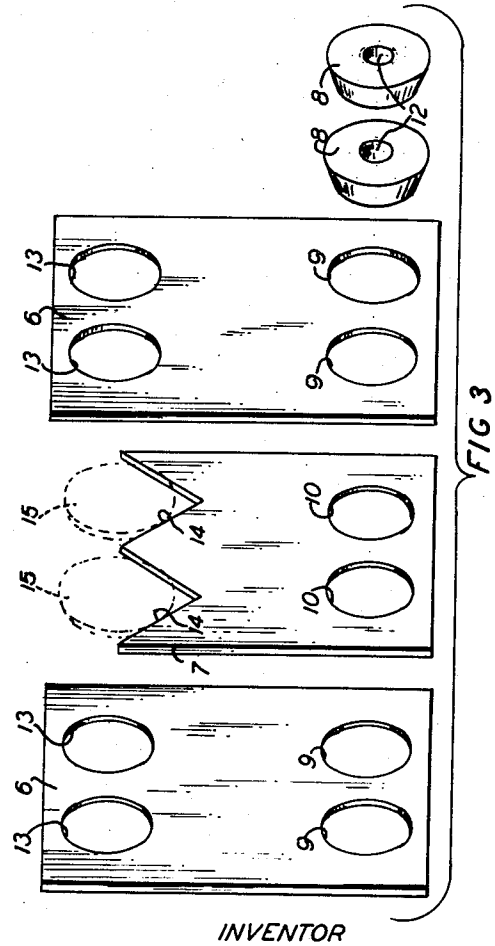


FIG 3

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MASKING UNIT FOR SPRAYING MACHINES

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1 Claim. (Cl. 118—503)

This invention relates to masking units used to protect a portion of the surface of an object on which material is being sprayed or applied by some other method.

In the manufacture of varistor discs, for example, one known type of spraying machine comprises an endless carriage on which an array of individual masking units are semi-permanently mounted. The units hold the articles being sprayed and become encrusted, warped and corroded due to the detrimental effect of the hot abrasive copper spray necessitating frequent disassembling for cleaning and reconditioning. During the disassembling and reassembling of the units, the spraying machine is of course inoperative at a considerable loss in production.

It is, therefore, one object of this invention to reduce the time lost in reconditioning machines of this type, more specifically an object of the invention is to provide an inexpensive masking unit which can be very quickly mounted on and removed from such a machine.

The masking units according to the invention are of the preassembled type which can be quickly attached to the machine in proper alignment and held in position by a quick-acting clamp. Each of these units may comprise two outer perforated plates, an intermediate perforated space plate to separate the outer plates and support articles between the plates, and dowels of resilient material extending through perforations to hold them in proper relative positions. The dowels are preferably long enough to extend beyond the outer plate to engaged recesses in the machine to facilitate the alignment of the masking units.

Other objects and features of the invention will be more readily understood from the following detailed description when read in conjunction with the accompanying drawings, in which:

Fig. 1 is a partial top view of a spraying machine embodying the invention;

Fig. 2 is an end view showing one of the masking units clamped in an operating position;

Fig. 3 is an exploded view of one of the masking units; and

Fig. 4 is a front view of a sprayed varistor disc which the particular masking unit shown is designed to mask.

Referring first to Fig. 1, the spraying machine comprises an endless conveyor 1 extending around a driving sprocket 2 from a second sprocket (not shown) and carrying a series of brackets 3, each provided with a quick acting clamp 4 and suitably recessed to receive a masking unit 5. On either side of the conveyor is mounted a metal spray gun 6 which reciprocates along track 7 to apply a desired number of coats of sprayed metal to each article nested in the units 5 as it moves from left to right. The articles such as discs 15 to be sprayed are placed in the units near the left end of the machine and after passing between the spray guns may be discharged by gravity.

As shown in Fig. 3, each of the units 5 comprises two identical outer perforated plates 6, 6 and an intermediate perforated work supporting space plate 7 held together by

dowels 8, 8 extending through the aligning holes or perforations 9, 9 and 10, 10 to form a unitary assembly.

To avoid the necessity for locating the performations 9 and 10 with a high degree of accuracy it is important that the dowels be made of a resilient material such as rubber and that they be large enough to fit tightly in the perforations thereby holding all three plates tightly together even though the perforations are of slightly different sizes and not in exactly the same relative locations in all plates. It is found that the efficiency of the dowels in this respect is improved by providing each one with a central hole 12 to make it more easily compressible. The intermediate plate 7 may be made of a corrosion resistant metal such as aluminum and it should be of the proper thickness to space the outer plates 9—9 by slightly more than the thickness of the articles to be sprayed so the articles may be easily loaded in and discharged from the units. The work supporting end of the plate is properly shaped to hold the article to be sprayed in the desired positions with respect to the perforations or spray apertures 13. For the particular application illustrated, where the articles are circular discs, they may be supported by suitably located V slots 14. The outer plates 6 are preferably made of a material to which the sprayed material does not readily adhere or from which encrusted material may be readily removed. For copper spraying applications, steel has been found very satisfactory. The perforations 9 may be of the same size and shape as the masking perforations 13 so that the plates may be mounted in the assembly in either position. Alternatively they may be of different sizes and shapes so that a single plate may be used to provide two different masking apertures. In this case if the sizes of apertures 9 and 13 are widely different, dowels of two different sizes may be required. While the masking perforations have been shown as being circular, it will be noted that they may be of other required shapes such as rectangular or diamond shape and in many such cases dowels of the type shown would be effective in holding the plates in proper relative positions. Dowels of other cross-section may be provided, if necessary, to preserve the reversibility feature of the plates. In view of the foregoing description, it will be apparent that when a unit of this type is no longer serviceable it may be very quickly removed from the machine and disassembled into its component parts. Plates 6 may be replaced with new or reconditioned plates and encrusted plates may be cleaned by mass tumbling thereby recovering the sprayed material such as copper and permitting the cleaned plates to be used again if not excessively deformed or corroded.

When replacement of the prior type of units was required, it was found in one instance it was necessary to take the machine out of production for a full working day whereas with the new type of preassembled units it was possible to replace all the units of the machine in fifteen minutes. The removed units may then be reconditioned at any convenient time without interfering with production.

It is to be understood that the above described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

A masking unit for wafer-like articles to be sprayed comprising two outer plates having aligning holes, at least one of the plates also having an aperture for passing the sprayed material, an intermediate plate of a thickness slightly greater than the thickness of the articles to be sprayed also having aligning holes and dowels of resilient material extending through the holes of all the plates

holding the intermediate plate in position to support an article in a desired position with respect to the spray aperture and forming an assembly which may be clamped as a unit in a spraying machine and readily disassembled for reconditioning, one end of each dowel of said assembly extending beyond one of the outer plates to serve as a locating member for the unit when clamped in the machine.

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