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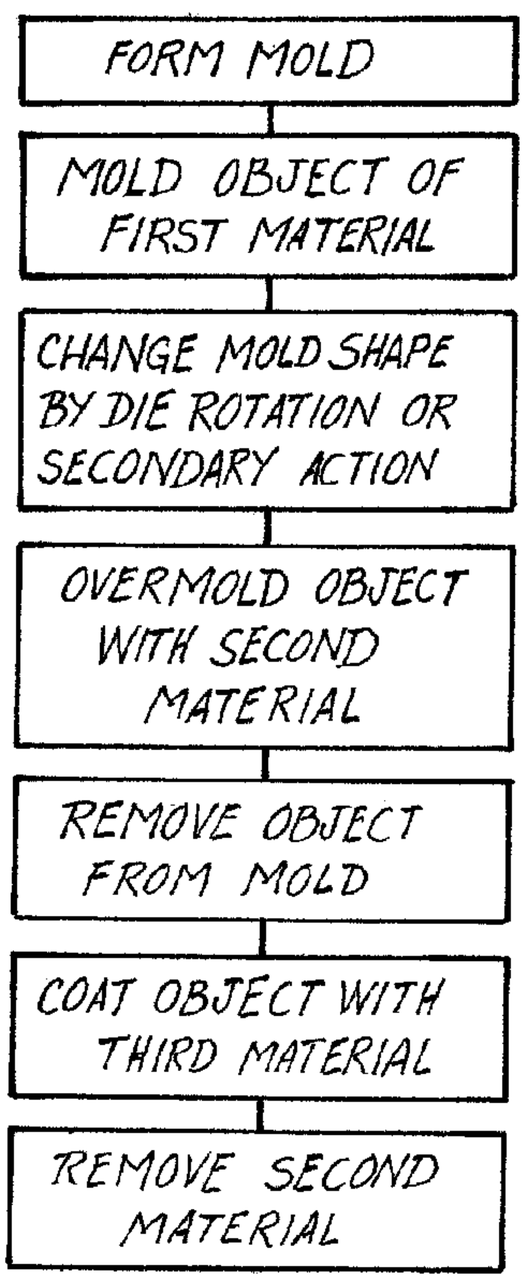
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(54) Titre : MASQUAGE EN MOULE EN DEUX TEMPS
(54) Title: IN-MOLD DUAL SHOT MASKING



(57) Abrégé/Abstract:
A method of selectively applying a pattern to a molded part comprises the steps of forming a mold (8); molding a three-dimensional object (10) having at least one face (12) in the mold, the three-dimensional object (10) being formed of a first material. Masking the at least the one face (12) of the three-dimensional object (10) with a mask (14) comprising a reverse image of a desired pattern while the three-dimensional object is still in the mold. Overmolding the three-dimensional object (10) with a second material to provide the reverse image. Removing the three-dimensional object (10) from the mold, coating at least the one face 12 of the three-dimensional object with a third material; and removing the second material to reveal the desired image.

ABSTRACT

A method of selectively applying a pattern to a molded part comprises the steps of forming a mold (8); molding a three-dimensional object (10) having at least one face (12) in the mold, the three-dimensional object (10) being formed of a first material. Masking the at least the one face (12) of the three-dimensional object (10) with a mask (14) comprising a reverse image of a desired pattern while the three-dimensional object is still in the mold. Overmolding the three-dimensional object (10) with a second material to provide the reverse image. Removing the three-dimensional object (10) from the mold, coating at least the one face 12 of the three-dimensional object with a third material; and removing the second material to reveal the desired image.

Attorney Docket No.: 02-4-143 PATENT APPLICATION

IN-MOLD DUAL SHOT MASKING

TECHNICAL FIELD

001. This invention relates generally to pattern forming and more particularly to a method of forming a pattern on an object.

BACKGROUND ART

002. When forming patterns such as metallized figures on previously molded plastic objects it is the general practice to mold the object, remove it from the mold, create a mask having a reverse image of a desired pattern, fix the mask to the object and then coat the pattern, usually with a metal. The critical part of the prior art process is the mask. Additional time is required when a product needs a specific mask and after being made, the mask requires a great deal of maintenance such as cleaning, repair, fit adjustments, etc.

003. It would be an advance in the art if a method could be provided that improved the patterning art.

DISCLOSURE OF INVENTION

004. It is, therefore, an object of the invention to obviate the disadvantages of the prior art.

005. It is another object of the invention to enhance the preparation of patterned objects.

006. These objects are accomplished, in one aspect of the invention, by a method of selectively applying a pattern to a molded part that comprises the steps of forming a mold; molding a three-dimensional object having at least one face in the mold, the three-dimensional object being formed of a first material; masking the at least one face of the three-dimensional object with a reverse image of a desired pattern

while the three-dimensional object is still in the mold; overmolding the three-dimensional object with a second material to provide the reverse image; removing the three-dimensional object from the mold; coating at least the one face of the three-dimensional object with a third material; and removing the second material to reveal the desired pattern.

007. This process eliminates the previously required cleaning, repairing and fit adjustments for the mask. Further, eliminating the need for accurately positioning the mask reduces cycle times.

BRIEF DESCRIPTION OF THE DRAWINGS

008. Fig. 1 is a diagrammatic, perspective view of a three-dimensional object having a pattern on one face;

009. Fig. 2 is a diagrammatic sectional view of a mold;

0010. Fig. 3 is a diagrammatic sectional view of the mold with a mask in place;

0011. Fig. 4 is a diagrammatic, perspective view of an object with a second material in place;

0012. Fig. 5 is a diagrammatic, perspective view of an object with the second material being removed;

0013. Fig. 6 is a flow diagram of the method of the invention; and

0014. Fig. 7 is a diagrammatic, perspective view of an alternate embodiment.

BEST MODE FOR CARRYING OUT THE INVENTION

0015. For a better understanding of the present invention, together with other and further objects, advantages and capabilities thereof, reference is made to the following disclosure and appended claims taken in conjunction with the above-described drawings.

0016. Referring now to the drawings with greater particularity, there is shown in Fig. 1 a three-dimensional object 10 having at least one face 12 upon which it is desired to form a pattern. In the example of Fig. 1 the pattern comprises a plurality of lines 13, preferably of metal, it being understood that other materials such as plastic and other patterns or designs can be employed.

0017. A mold 8 is provided having the usual cavity 9 for forming the object 10. Two gates, 8a and 8b, can be provided, gate 8a being used to infuse a first material and gate 8b being used to infuse a second material. The materials should be selected so that they do not have a strong affinity to permanently adhere to one another. For example, in a preferred embodiment of the invention, the first material can be a polycarbonate and the second material can be Santoprene™. The latter material has an additional advantage in that it is recyclable. Alternatively, the second material can be an elastomeric material of a rigid plastic.

0018. Fig. 2 illustrates an object 10 in the mold 8 after having been formed from the first material and Fig. 3 illustrates the object 10 in the mold 8 with a mask 14 in position on the face 12. With the mask in position the second material is cast about the previously formed object 10, filling in at least the reverse image designated by the areas 15. Over molding a second material over a first material is known in the art; however, such art requires as close to a permanent bond between the materials as it is possible to achieve.

0019. With the object 10 overcoated with the second material it is removed from the mold 8 and placed in a coating receptacle 20 and a third material is applied over the second coating.

0020. The third material can be any material that can be applied as a fluid, such as a liquid, for example, a polymer paint, or a vapor, gas or plasma.

0021. In a preferred embodiment the second material can be provided with at least one pull-tab 16 to be used in removing the second material, as is shown in Fig. 5. Removing the second material leaves the desired pattern on the face 12, as is shown in Fig. 1.

0022. Alternatively, when the second material is a rigid plastic, pull-tabs 16a can be provided which can be broken off or sprung to release the mask.

0023. There is thus provided a method for forming patterns that eliminates the problems associated with the prior art.

0024. While there have been shown and described what are present considered to be the preferred embodiments of the invention, it will be apparent to those skilled in the art that various changes and modifications can be made herein without departing from the scope of the invention as defined by the appended claims.

CLAIMS:

What is claimed is:

1. A method of selectively applying a pattern to a molded part comprising the steps of:

forming a mold;

molding the three-dimensional object having at least one face in said mold, said three-dimensional object being formed of a first material;

masking said at least said one face of said three-dimensional object with a reverse image of a desired pattern while said three-dimensional object is still in said mold;

overmolding said three-dimensional object with a second material to provide said reverse image;

removing said three-dimensional object from said mold;

coating at least said one face of said three-dimensional object with a third material; and

removing said second material to reveal said desired pattern.

2. The method of Claim 1 wherein said first material is plastic.

3. The method of Claim 2 wherein said second material is selected from the group consisting of rubber and elastomers.

4. The method of Claim 3 wherein said third material is selected from the group consisting of metal and polymers.

5. The method of Claim 4 wherein said second material includes a graspable pull-tab.

6. The method of Claim 2 wherein said second material is a rigid plastic.

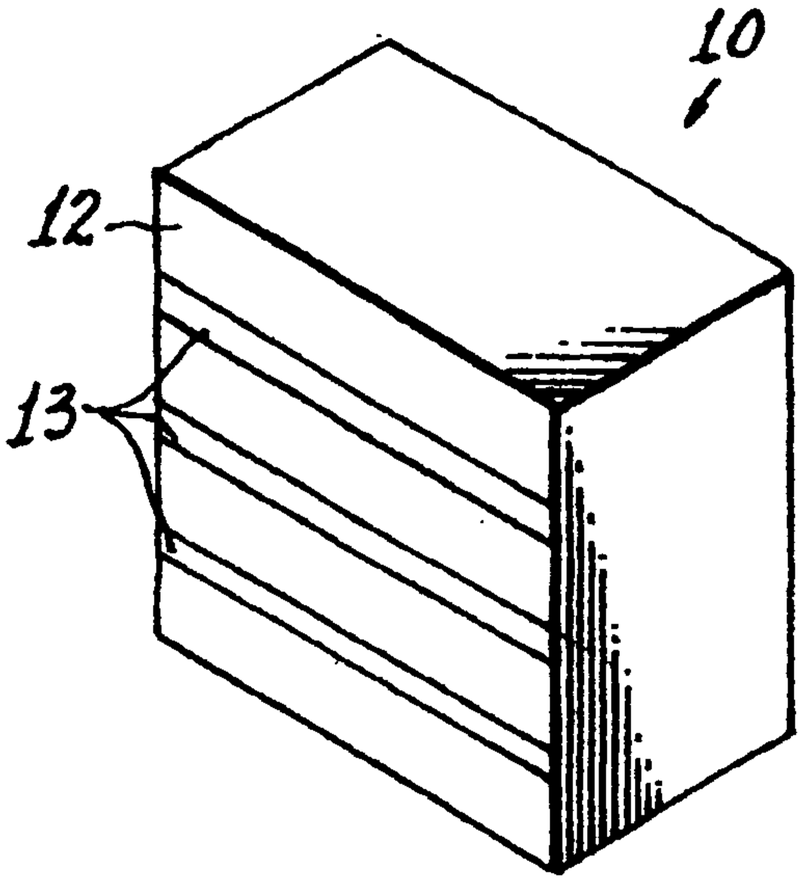


Fig. 1

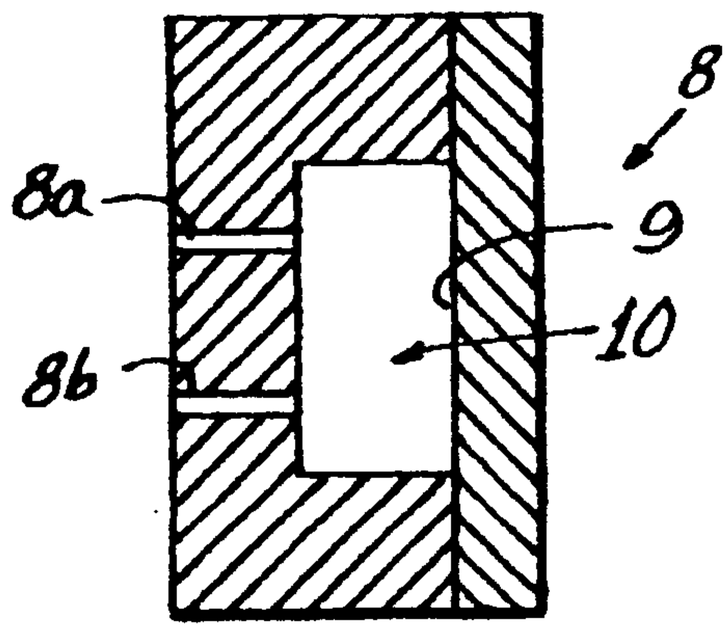


Fig. 2

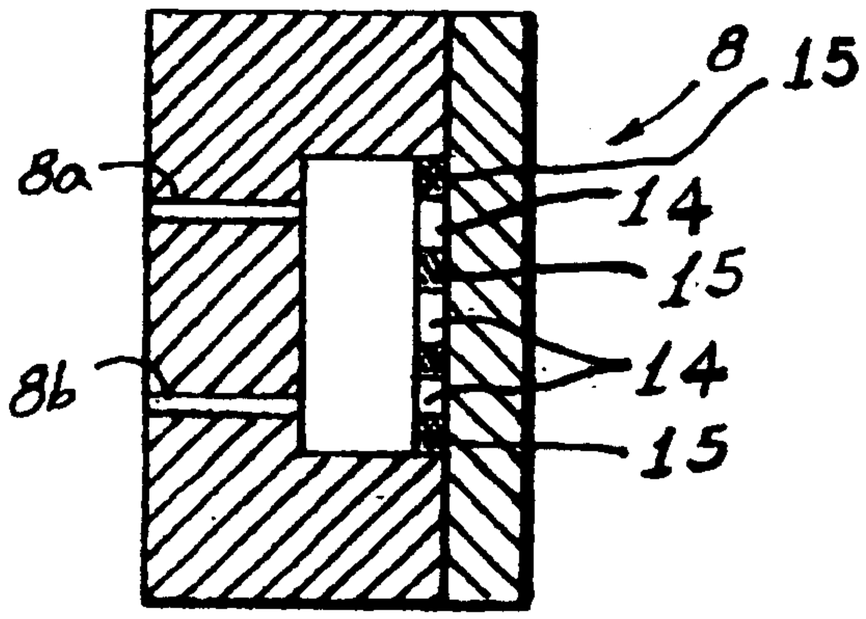


Fig. 3

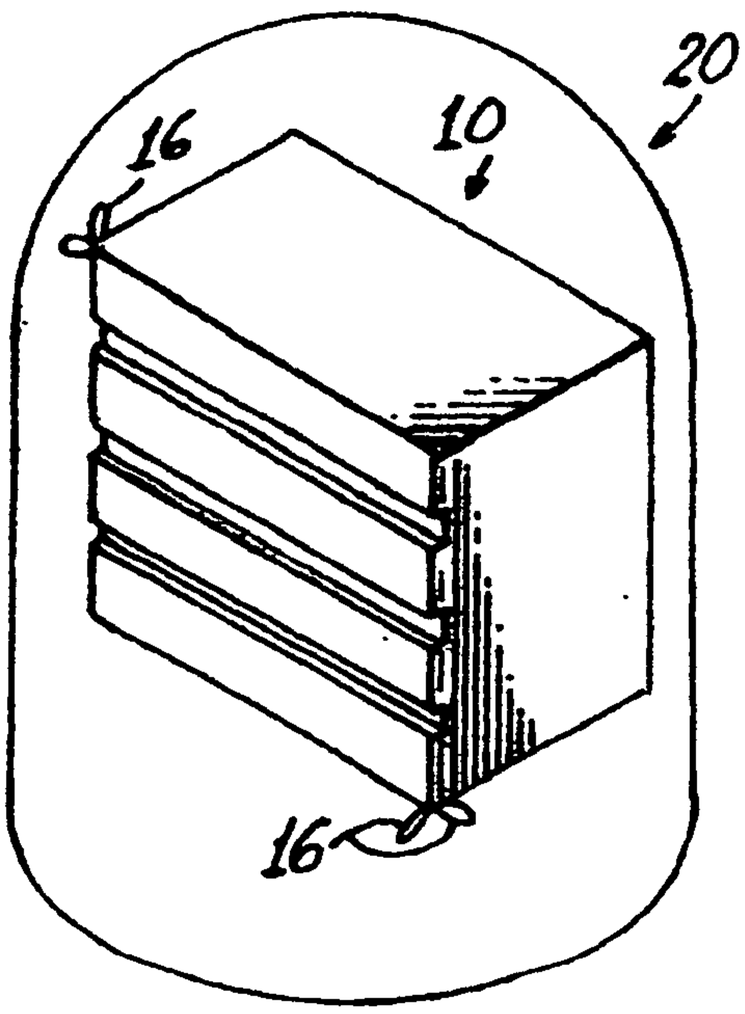


Fig. 4

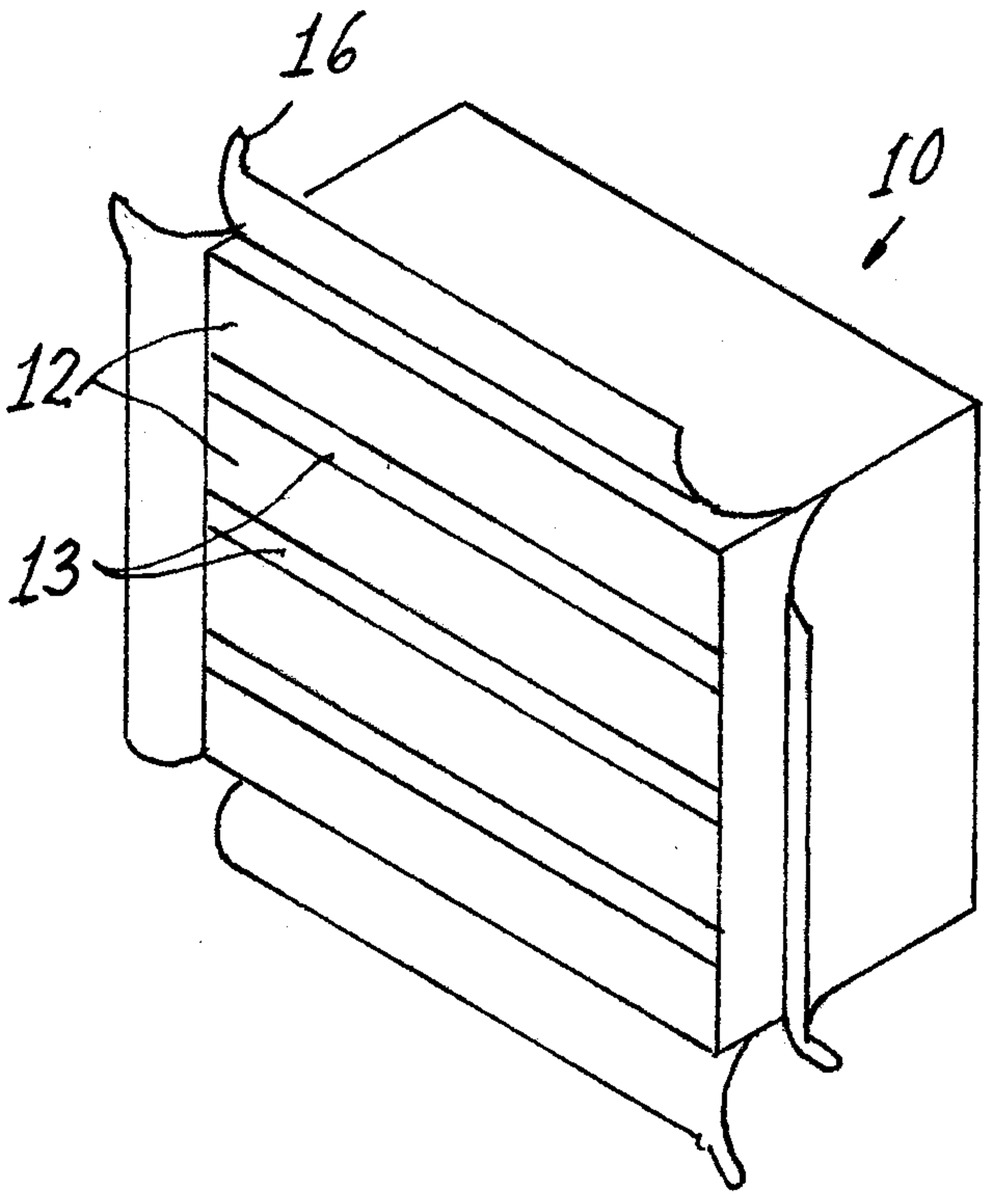


Fig. 5

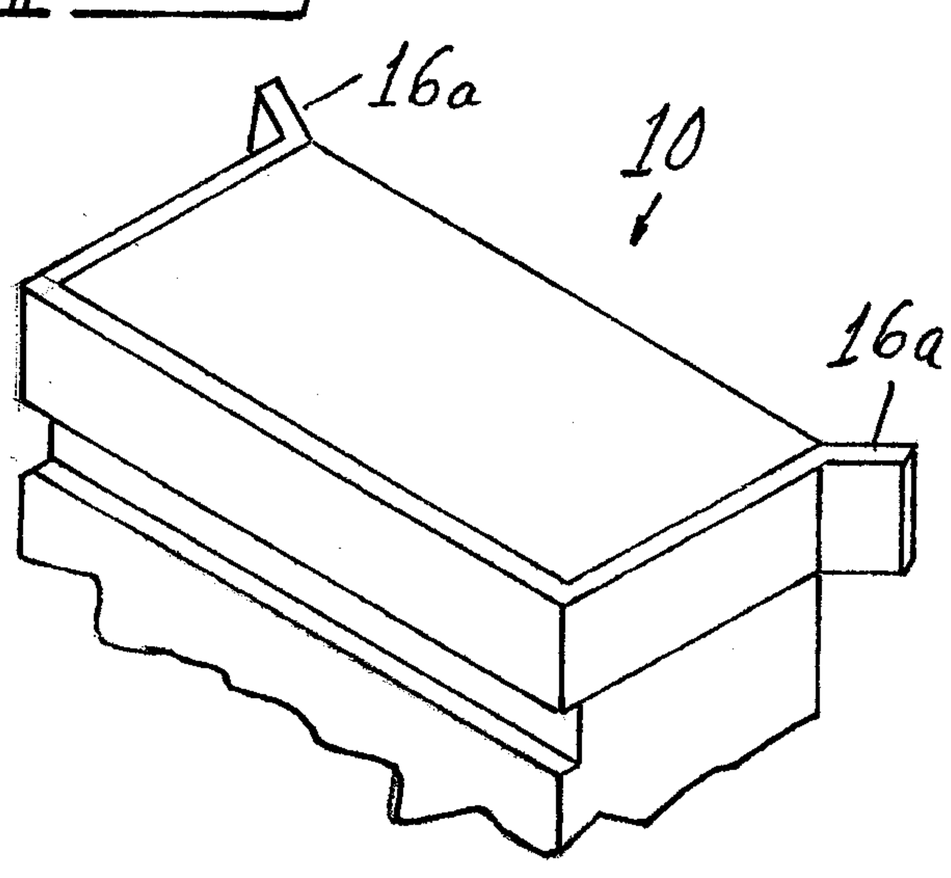


Fig. 7

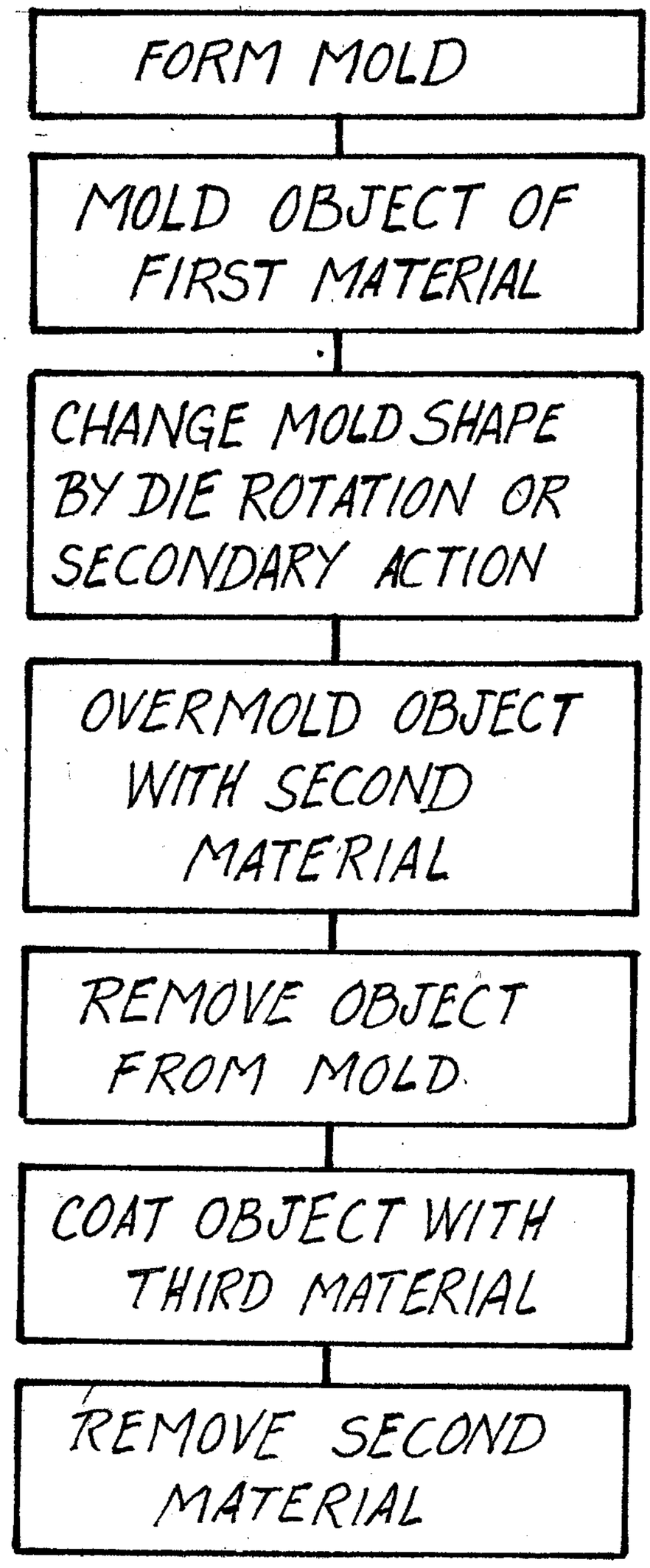


Fig. 6

FORM MOLD

MOLD OBJECT OF FIRST MATERIAL

CHANGE MOLD SHAPE BY DIE ROTATION OR SECONDARY ACTION

OVERMOLD OBJECT WITH SECOND MATERIAL

REMOVE OBJECT FROM MOLD

COAT OBJECT WITH THIRD MATERIAL

REMOVE SECOND MATERIAL