June 30, 1942. J. A. GITS ET AL 2,288,187

METHOD OF FORMING INDICIA ON COUNTERWHEELS

Filed March 12, 1938

Fig. 1.

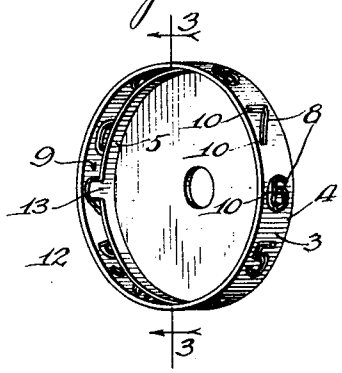


Fig. 2.

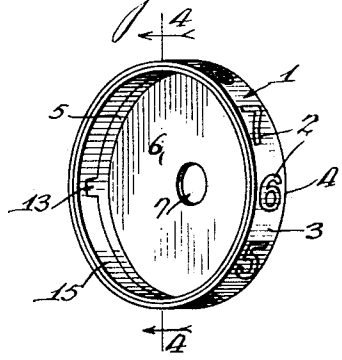


Fig. 6.

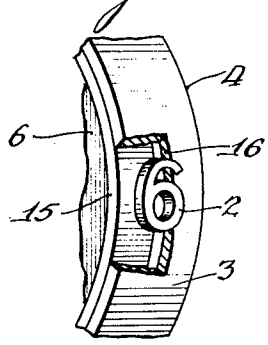


Fig. 3.

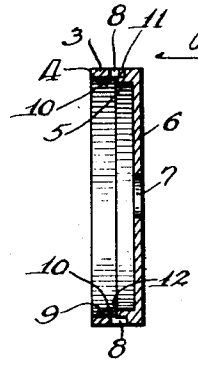


Fig. 5.

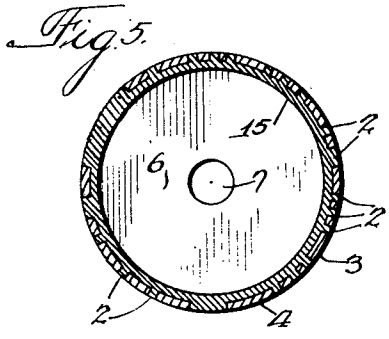
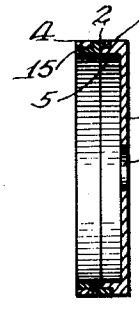


Fig. 4.



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Patented June 30, 1942 2,288,187

UNITED STATES PATENT OFFICE

2,288,187

METHOD OF FORMING INDICIA ON COUNTER WHEELS

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Application March 12, 1938, Serial No. 195,505

6 Claims. (Cl. 18—61)

This invention relates to a method of forming indicia on counterwheels and similar devices having numerals and other indicia carried upon a peripheral surface.

More particularly, the invention is directed to a method of forming the same wherein numerals or other indicia are provided upon the peripheral surface of a counterwheel or similar device in a distinctive and novel manner.

Counterwheels and all like numeral or indicia bearing peripheral surfaces are usually molded or otherwise formed with their numerals or characters either by being recessed in or by being formed in relief upon the peripheral surface. Formed in this manner, the numerals or characters are indistinct and lack a proper contrasty relation with the surface in order to be readily noticeable unless they are painted. However, painting is tedious and not satisfactory. Plastic materials generally used in the construction of such devices will not satisfactorily retain paint upon their surfaces. Moreover, it is exceedingly difficult to lodge the paint in recesses formed in a peripheral surface and secure an even distribution so that the numerals or characters will be coated uniformly and appear without irregular outlines. Usually, the peripheral surface is dipped until the paint enters the recesses and is then wiped. Wiping causes withdrawal of the paint from the recesses and often leaves a very undesirable smeary appearance. More paint is lost by the wiping operation than actually used in the recesses to coat the numerals or characters. Moreover, recesses soon accumulate dirt which makes the painted surfaces indistinct.

An object of the invention is to provide an improved process for making the same, wherein the above noted difficulties are eliminated and the numerals or characters are molded upon the peripheral surface by a subsequent operation whereby these numerals or characters may be of a different color to secure a permanent contrasty appearance and be so formed that they are in effect an integral part of and are inseparable from this peripheral surface.

More specifically, the invention is directed to the provision of a simple and inexpensive method of rapidly forming numerals and characters upon a peripheral surface so that they may be in effect made to appear as an integral part thereof and of a material having a desirable color contrast that will make them permanently distinct without possibility of being obliterated by dirt or destroyed by wear.

The improved form of structure may be made by first molding the wheel, or other device having a numeral or character bearing peripheral surface, with proper recesses conforming to the numerals or characters and with an annular or proper recess about the inner peripheral surface that extends sufficiently into the peripheral wall to communicate with the recesses conforming to the numerals or characters to be formed. By a second molding operation, the differently colored material forming the numerals or characters may then be injected into the peripheral recesses conforming thereto through the inner annular recess. It is found that injection molding very satisfactorily forces the material into these recesses conforming to the numerals and characters and that a suitable or proper bond between the characters and the wall will be formed not only by the high pressure injection that may be used, but also by the material flowing into and filling the inner annular recess to provide keying means that mechanically interlocks the parts into a single unit.

Other objects and advantages of the invention will be apparent from the following detailed description when taken in connection with the accompanying drawing which forms a part hereof.

In the drawing:

Figure 1 illustrates a numeral wheel as it appears after the first operation but before the numerals are formed in the recesses provided in the peripheral surface;

Fig. 2 is a similar view of the numeral wheel in its finished form;

Fig. 3 is a vertical sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is a similar vertical section taken on line 4—4 of Fig. 2;

Fig. 5 is a transverse section taken through the medial plane of the device shown in Fig. 2; and,

Fig. 6 is a fragmentary detail view showing a portion of the peripheral wall cut away to illustrate the formation of the numeral and the manner in which an inner keying band is integrally formed with the numeral. This view also illustrates how the numeral is bonded in the peripheral wall to form an integral part thereof.

Devices of the type disclosed herein adapted to embody the invention are usually molded of a plastic material. Cellulose compositions are particularly mentioned. It is to be understood at the outset, however, that the invention is not to be limited to the kind of material used because such devices may be formed of metal and may be adapted to a wide variety of uses.

To illustrate one embodiment of the invention,

Fig. 2 shows a counterwheel 1 having a plurality of numerals 2 embedded in the outer peripheral surface 3. The particular construction of counterwheel 1 varies according to the type of mounting therefor and its use. In its simplest form, counterwheel 1 will have a peripheral wall 4 provided with outer face 3 and inner face 5. It may have a vertical wall 6 apertured at 7 or any other form of structure adapted to provide a proper mounting therefor.

Essentially, counterwheel 1 will have a plurality of recesses 8 in wall 4 about the outer surface 3 conforming to the outline of numerals 2 or other characters or symbols to be formed thereon. An inner annular recess 9 in the form of an undercut, as shown specifically in Figs. 1 and 3, extends about inner face 5 inwardly a suitable distance. It will be noted that the combined depth (radially) of inner annular recess 9 and the recesses 8 may, if so desired, equal a thickness of peripheral wall 4, and that inner recess 9 extends inwardly sufficiently to meet the outer recesses 8, as indicated at 10 in Fig. 3. In other words, the depth of recess 9 is such that it will extend to the floor 11 of recesses 8 and provide communication with each recess 8, as indicated at 10. The extent of this opening 10 between each recess 8 and the recess 9 will largely depend upon the shape of recesses 8. For example, recess 9 has two openings 10 with the numeral seven and one larger opening with the numeral six, as shown in Fig. 1. Recess 9 will, therefore, be cut inwardly a sufficient distance to provide an opening 10 of sufficient size or a number of such openings 10 with each recess 8. The arrangement provides an annular shoulder 12 on the inside of peripheral wall 4. A locking lug 13 to be presently described may also be furnished, as shown in Fig. 1. The structure thus far described of counterwheel 1 may be formed in one or more operations, but it is found that this structure may be advantageously formed at minimum cost by single injection type of molding operation.

Counterwheel 1 is then placed in a second mold and material of a different color injected into numeral or character recesses 8 through annular recess 9. It will be understood that the material of the second injection operation forming numerals or characters 2 may be of the same or different kind than employed in forming wheel 1. Seating wheel 1 in a mold cavity having a smooth surface, against which outer face 3 rests, will form numerals or characters 2 flush with outer face 3, and by employing high pressure, say of the order of thirteen to fifteen tons, a satisfactory bond between the walls of recesses 8 and the material forming numerals 2 will be provided that will eliminate need for further mechanical keying means, if so desired. Moreover, this operation will form the surfaces of numerals 2 flush with peripheral surface 3 and give a continuous-like appearance between the same, except for their difference of color.

Material of the second operation will fill each cavity 8 and produce a character 2. As stated, with the exception of their different color, characters 2 will appear as an integrally formed part of peripheral wall 4. Also, this differently colored material will follow into and fill inner annular recess 9 to form a band 15, which, with the exception of its different color, will also appear as an integrally formed part of inner surface 5.

Fig. 6 is a sectional detail of the manner in which numeral six is formed within its recess and is locked therein by virtue of its integrally molded relation with inner band 15. A portion of peripheral wall 4 has been cut away, as indicated at 16, in order to show this structural relation. This figure clearly illustrates how each numeral, character, symbol, or other indicia to be formed upon peripheral surface 3, is inlaid or securely embedded a sufficient depth in peripheral wall 4 to admit of an integral relation with a band that is likewise inlaid or embedded in this peripheral wall 4 about inner surface 5. Hence, this type of construction provides a definite structural relation between the characters 2 (so formed in peripheral wall 4 as to be exposed at its outer surface 3) and this integrally molded keying member 15 (formed about the inner surface 5).

The method disclosed for producing this improved and novel type of structure does not require increased dimensions for the structure to accommodate these inlaid characters 2 and key band 15. By providing recesses 8 of a predetermined depth in peripheral wall 4 about outer face 3 and then by undercutting inner surface 5 until recess 9 formed thereby meets floor 11 of these outer recesses 8, a very practical arrangement is provided to admit of a molding operation that will flow the material into outer recesses 8 through said undercut or recess 9. This will assure perfect formation of characters 2 and an outer surface therefor that will be smooth and have an appearance of continuity with surface 3. Consequently, the different color for characters 2 will give the latter a distinct and outstanding appearance with respect to peripheral surface 3. This construction prevents any separation of characters 2 from peripheral wall 4 and will obviously not permit of any obliteration of the characters by wear or dirt.

The operations described herein are simple and the device may be made at low cost. Aside from the standpoint of cost, a product is produced that is superior to the painted product heretofore known.

The invention is directed to any type of device that may have a peripheral surface wherein it is desired to incorporate numerals, letters, symbols or indicia, including surface portions of various configurations, that are to be formed in a distinctive manner with respect to the peripheral surface.

Without further elaboration, the foregoing will so fully explain the gist of our invention that others may, my applying current knowledge, readily adopt the same for use under varying conditions of service, without eliminating certain features, which may properly be said to constitute the essential items of novelty involved, which items are intended to be defined and secured to us by the following claims.

We claim:

1. A method of forming indicia upon a peripheral wall which comprises forming said peripheral wall with a plurality of indicia recesses in its outer surface and with an annular recess in its inner surface that communicates with the indicia recesses by restricted openings in the floor of said indicia recesses, and flowing molten material into one of said recesses to fill said indicia recesses and said annular recess, the material in said annular recess forming a head on that side of said body that presents a surface parallel to the other side of said body and the indicia formed therein.

2. A method of forming indicia upon a peripheral wall which comprises forming said peripheral wall with indicia conforming recess or re-

cesses in its outer surface, undercutting the inner surface of said wall along one edge thereof until an opening with said indicia recess is secured, flowing material to form said indicia into said indicia recess through said undercut in said inner surface, and filling both said indicia recess and said undercut with said material.

3. A method of molding indicia characters in the wall of a wheel so that said characters are exposed along the outer peripheral surface thereof which comprises forming indicia-conforming recesses of predetermined depth in said wall along said outer peripheral surface, forming an annular recess that extends inwardly along the inner peripheral surface from an inner peripheral edge of said wall, limiting the depth and the extent of inward dimension of said anular recess to a distance that causes the same to intercept said indicia-conforming recesses and communicate therewith, and flowing indicia-forming material inwardly along said annular recess until both said indicia-conforming recesses and said annular recess are filled.

4. A method of molding an indicia character in the wall of a wheel so that said character is exposed along the outer peripheral surface thereof which comprises forming an indicia-conforming recess of predetermined depth in said wall along said outer peripheral surface, forming a second recess that extends inwardly along the inner peripheral surface from an inner peripheral edge of said wall, limiting the depth and the extent of inward dimension of said second recess to a distance that causes the same to intercept said indicia-conforming recess, and flowing indicia-forming material inwardly into said second recess until both said indicia-conforming recess and said second recess are filled.

5. A method of molding indicia in the wall of an annular body so that said indicia are exposed along the outer peripheral surface thereof which comprises forming indicia-conforming recesses in said wall along said outer peripheral surface forming a recess as an undercut along the inner peripheral surface of said wheel, said recess being of a depth equal at least to the difference between the depth of said indicia-conforming recesses and the thickness of said wall, said recess being extended crosswise of said inner peripheral surface from one edge thereof to intercept a portion of each indicia-conforming recess, and flowing indicia-forming material into said indicia-conforming recesses and said recess forming an undercut to form said indicia and to fill said latter recess.

6. A method of molding indicia in the wall of an annular body so that said indicia are exposed along the outer peripheral surface thereof which comprises forming indicia-conforming recesses of a predetermined depth in said wall along said outer peripheral surface, forming a recess in said wall along an inner peripheral surface opposing said outer peripheral surface, predetermining the depth of said recess on said inner peripheral surface to provide an opening between the same and said indicia recesses, the opening being of such size and extent with respect to said indicia recesses that a portion only of the floor of said indicia recesses is removed but unrestricted communication is provided between said inner recess and each indicia recess, and flowing indicia-forming material through said inner recess to fill said indicia recesses.

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