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SURFACE MARKING DEVICE FOR CONTAINERS

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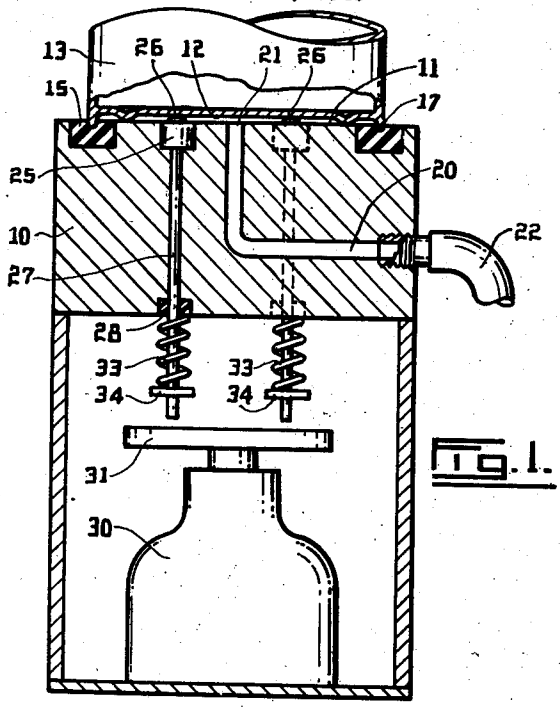


Fig. 1.

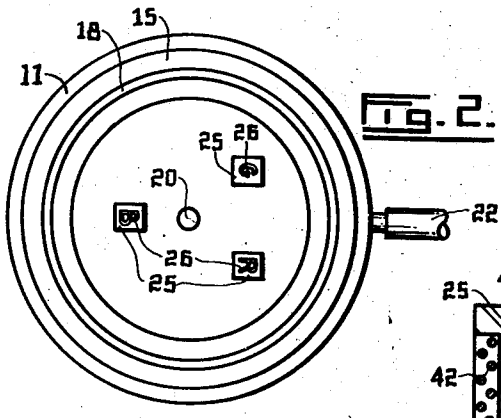


Fig. 2.

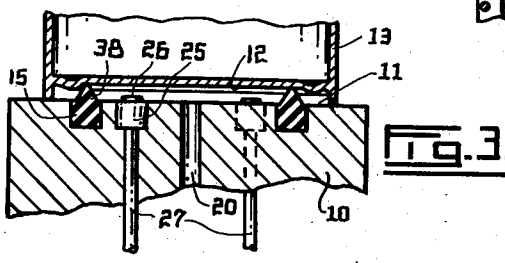


Fig. 3.

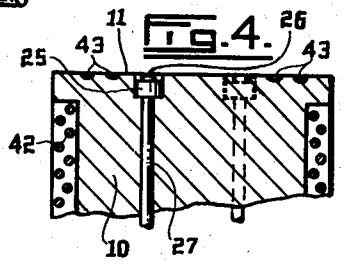


Fig. 4.

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SURFACE MARKING DEVICE FOR CONTAINERS

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4 Claims. (Cl. 101—4)

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This invention relates particularly to a device for marking surfaces formed of metal or other material.

The main purpose of this invention is to produce a device which may be used for marking containers, such as cans, after they have been filled and sealed. For example, in the fish canning industry large numbers of cans are packed at a time. Inspectors go through each pack and open a few cans to test the grade of the fish contained in them. If the fish does not measure up to the required standards, it is graded B. This fact must be indicated on the can in such a way that it cannot be removed. At present, there is no satisfactory way of doing this, the chief difficulty being that none of the known stamping or marking devices can satisfactorily operate on a thin metal surface which is not supported at the exact points where it is marked.

This invention makes it possible to impress on a filled can any desired marking without injuring the can or its contents. This is accomplished by providing a base having a working face, and means associated with the base for drawing a surface to be marked against the working face. In this example, the end of the can is drawn against the working face. One or more marking dies are movably mounted in the base and are adapted to move outwardly through the working face, and means is provided for driving the die or dies against the can surface drawn against said face. The surface is preferably drawn against the working face by suction means, although magnetic means may be applied. While this device is particularly designed for marking cans, it is to be understood that it may be used for marking any surface. It is particularly useful in places where it is not practical to place a die or pressure plate behind the surface area to be marked.

Examples of this invention are illustrated in the accompanying drawings, in which:

Figure 1 is a vertical section through a surface marking device,

Figure 2 is a plan view of the device shown in Figure 1 with the can removed,

Figure 3 is a fragmentary sectional view of an alternative similar to the device shown in Figure 1, and

Figure 4 is a fragmentary sectional view through another alternative surface marking device.

Referring to the drawings, 10 is a base having a working face 11 which may be flat or shaped to receive the end 12 of a can 13. In Figure 1, suitable sealing means is provided at the working face, and this may be in the form of an endless sealing ring 15 formed of suitable compressible material which is substantially flush with the working face. The sealing ring in this example is circular, and as most cans have an annular flange 17 at the ends thereof, this ring is provided with a groove 18 in its surface into which this flange may extend.

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Suction means is provided for drawing the surface or end 12 against the working face 11. One way of accomplishing this is to form at least one passage 20 in the base which opens outwardly through the working face at 21 within the ring 15. A pipe 22 connects the end of the passage 20 to suitable suction apparatus, not shown.

When a can is placed on the base 10 with its flange resting on the sealing ring 15, the surface or end 12 is drawn towards the working face 11 by removing the air from the space between said end and the working face through the passage 20. Thus, the surface or end 12 is held firmly against the working face, and the sealing ring prevents the vacuum from being broken.

One or more marking dies 25 are movably mounted in the base 10 and are adapted to move outwardly through the working face. The size, shape and number of these dies depends upon what marking is to be impressed on the can end. Figure 2 shows three of these marking dies, each having suitable indicia 26 on its outer end. A stem 27 extends downwardly from each marking die through the base. Each stem slidably fits in the base and a packing ring 28 may be provided at the point where the stem projects beyond the bottom of the base. Suitable means is provided for driving each die against the can surface. Each die may be pressed against the surface or it may be given a sharp blow to impress its indicia on said surface. Each die may be operated independently of the others, but in this example all the dies are moved at the same time. This may be accomplished by an electric vibrator 30 of any well-known construction which vibrates a plate 31 located beneath the lower ends of the stems 27. The plate 31 is shown as being spaced from the stem ends, but it is to be understood that it may always be in contact with them. When the plate is spaced from the stem ends the dies are given a series of sharp blows by the plate, and the sharpness of the blows depends upon the normal space between said plate and the stems. If the stems rest on the plate, the blows are not as sharp as they otherwise would be. If desired, springs 33 may be provided for urging the stems and their dies into their lowermost positions. Each spring may lie between a washer or shoulder 34 on the stem and the bottom of the base 10. When a can 13 is held in place on the working face of the base by the suction means, the vibrator may be operated to drive the marking dies against the surface 12 of the can to impress the indicia thereof in said surface. When a vibrator is used, each die will strike the can surface a number of times. However, it is possible that these dies may be driven only once against the can surface. As the can surface is held firmly against the working face, the indicia are clearly impressed in said surface without deforming the can or breaking the seal thereof.

In Figure 3, the sealing ring 15 is provided with

a rib 38 which projects above the working face 11 of the base 10. The marking dies 25 are all located within the sealing ring. When the suction is applied, the can end is drawn against the rib 38 of the sealing ring so that the latter prevents any appreciable amount of air from entering the space between the can and the working face. With this arrangement, the device may be used for marking any flat surface since the rib 38 of the sealing ring projects outwardly from the working face and surrounds the area to be marked. This area is firmly held in place by the action of the vacuum. In other words, the surface to be marked is firmly held at the point where it is struck by the marking die or dies. The alternative of Figure 3 with its ribbed sealing ring may be used on any surface, whereas the grooved sealing ring of Figure 1 is primarily for areas having protruding flanges surrounding them.

In Figure 4, the base 10 is preferably formed of soft iron, and an electric coil 42 is wound around a portion of said base to form therewith an electro-magnet. The working face 11 of this base may be flat or it may be shaped to fit the surface to be marked. When it is intended for marking cans, the working face may be provided with grooves 43 for receiving the ribs and flanges of the can ends.

In this example, the can end is magnetically drawn against the working face of the base, where it is held while the marking die or dies are driven against it.

From the above, it will be seen that this is a very simple and efficient device for marking surfaces. Although it is particularly designed for the ends of filled cans or containers, it may be used on any surface. It is particularly useful for marking thin material which is liable to be deformed by the marking operation. It is also very useful for very large surfaces which make it inconvenient to place a die or supporting plate behind the area being marked. This device may be permanently mounted, or it may be made into a compact portable unit which may be used for many different purposes.

What I claim as my invention is:

1. A device for permanently marking without deforming thin surfaces of closed containers, such as food cans, having an annular flange projecting outwardly from the surface around the area to be marked, comprising a base having a working face, an annular sealing ring formed of compressible material mounted in the face substantially flush therewith against which the flange of a container may be placed, suction means in the base opening out therefrom within the sealing ring firmly to draw the portion of the container surface within said ring towards the base and the centre flange against the ring, a marking die movably mounted in the base and opening outwardly through the working face thereof within the sealing ring opposite the container surface to be marked, indicia on the outer end of the die, and means mounted at the base for moving the die against the container surface drawn by suction towards the base to impress the indicia into said surface.

2. A device for permanently marking thin surfaces of closed containers, such as food cans, without deforming the containers, comprising a base having a working face, an annular sealing ring formed of compressible metal mounted in the working face and having a rib projecting beyond said face, said ring and rib surrounding the container surface to be marked when a container is held against the rib, suction means in the base opening out therefrom within the sealing ring firmly to draw said container surface towards the base and against the rib, a marking die movably mounted in the base and opening outwardly through the working face thereof within the sealing ring opposite the container surface to be marked, indicia on the outer end of the die, and means mounted at the base for moving the die against the container surface drawn by suction towards the base to impress the indicia into said surface.

3. A device for permanently marking without deforming thin surfaces of closed containers, such as food cans, having an annular flange projecting outwardly from the surface around the area to be marked, comprising a base having a working face, an annular sealing ring formed of compressible material mounted in the face substantially flush therewith against which the flange of a container may be placed, suction means in the base opening out therefrom within the sealing ring firmly to draw the portion of the container surface within said ring towards the base and the centre flange against the ring, a marking die movably mounted in the base and opening outwardly through the working face thereof within the sealing ring opposite the container surface to be marked, indicia on the outer end of the die, and means mounted at the base for rapidly vibrating the die against the container surface drawn by suction towards the working face of the base to impress the indicia into said surface without deforming the latter.

4. A device for permanently marking thin surfaces of closed containers, such as food cans, without deforming the containers, comprising a base having a working face, an annular sealing ring formed of compressible metal mounted in the working face and having a rib projecting beyond said face, said ring and rib surrounding the container surface to be marked when a container is held against the rib, suction means in the base opening out therefrom within the sealing ring firmly to draw said container surface towards the base and against the rib, a marking die movably mounted in the base and opening outwardly through the working face thereof within the sealing ring opposite the container surface to be marked, indicia on the outer end of the die, and means mounted at the base for rapidly vibrating the die against the container surface drawn by suction towards the working face of the base to impress the indicia into said surface without deforming the latter.

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