

United States Patent

[11] 3,563,169

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[21] Appl. No. **758,451**
[22] Filed **Sept. 9, 1968**
[45] Patented **Feb. 16, 1971**
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[54] **APPARATUS FOR PRINTING ARTICLES HAVING AN UPSTANDING FLANGE AROUND THEM**
1 Claim, 3 Drawing Figs.

[52] U.S. Cl..... **101/36;**
118/215; 118/254; 90/19; 90/20

[51] Int. Cl..... **B41f 17/36**

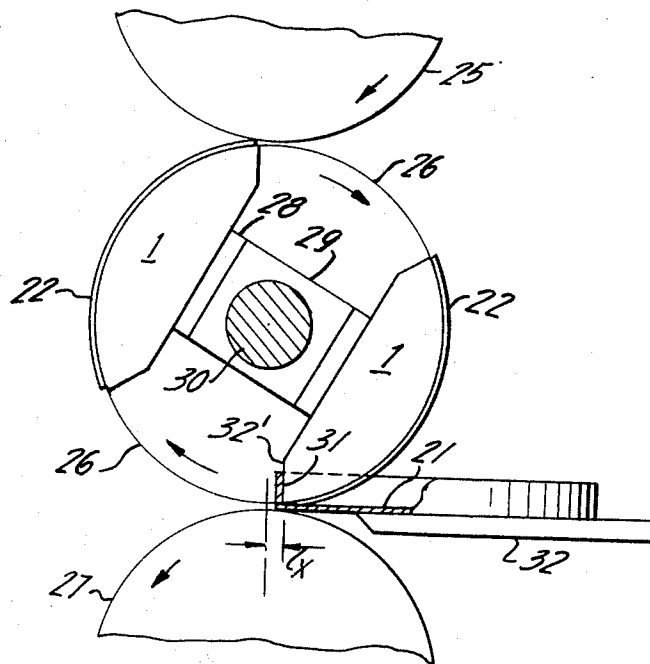
[50] Field of Search..... 101/35-
—37; 118/214, 215, 254; 90/19, 20, (Cursory)

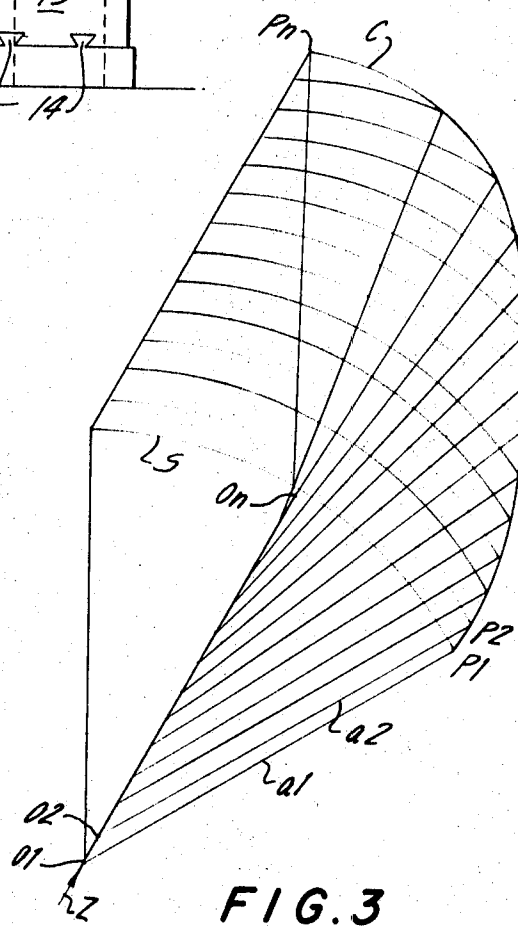
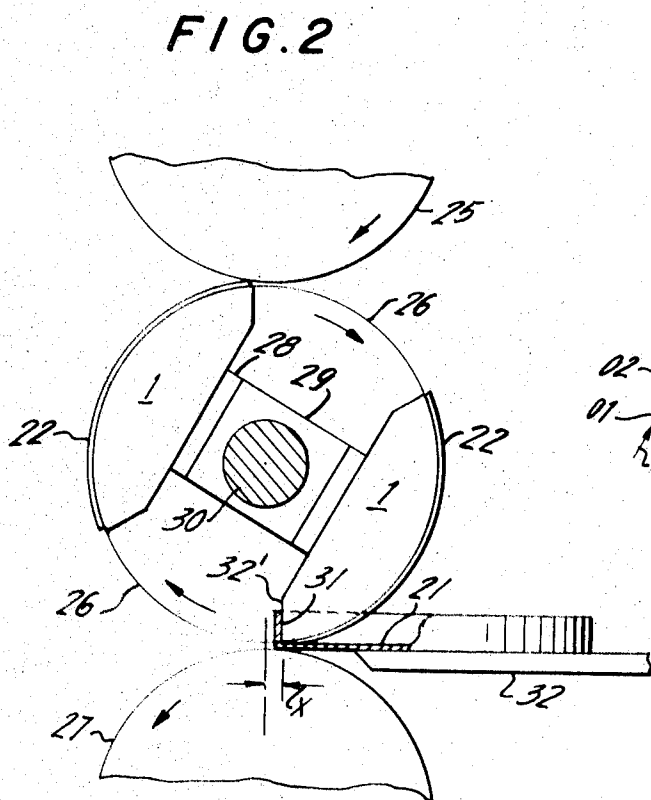
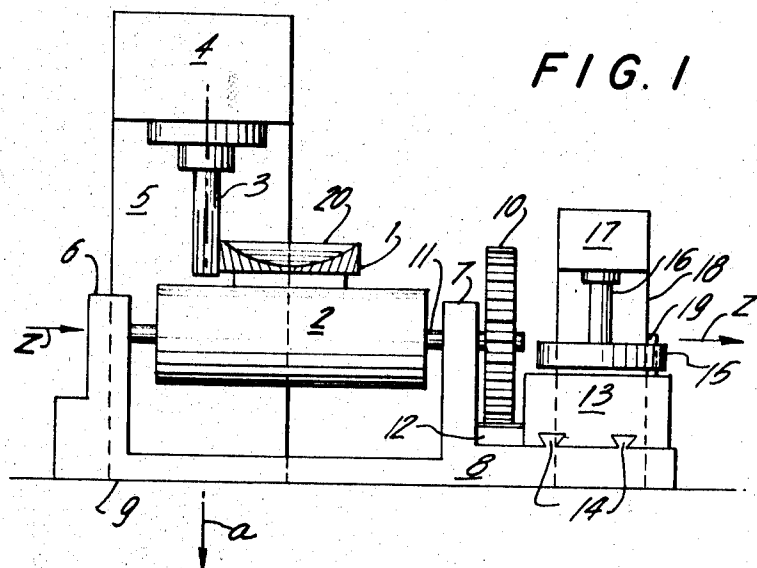
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ABSTRACT: The platen which carries the printing blanket in a dry offset lid printer is formed by a radial milling operation, producing substantially a right conoid configuration in the article engaging part of the platen which feeds the article as it comes into printing position. A proper relation of the elements is automatically obtained.





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APPARATUS FOR PRINTING ARTICLES HAVING AN UPSTANDING FLANGE AROUND THEM

BACKGROUND OF THE INVENTION

This invention relates to the decorating or color heads of package machinery which prints articles such as container lids.

More specifically, the invention is concerned with the platens or printing blanket supporting elements used in dry offset printing in such machinery.

It is the general object of the invention to provide a platen in which the lateral surfaces are so contoured with relation to the blanket surface that a smooth and accurate engagement of surfaces is brought about as the platen enters the lid or other article, so that the article is fed into the nip of the printing elements smoothly and in a predictable position.

A further object is to provide a platen construction which permits simple and precise generation of the required contours, and does not require difficult design engineering or a plurality of machining operations as has heretofore been necessary.

With the foregoing objects in mind, as well as others which will appear in the course of the following description, the invention will now first be described with reference to the accompanying drawings and the features forming the invention will then be pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawing;

FIG. 1 is a schematic side elevation of a radial milling arrangement for forming the platen of the invention;

FIG. 2 is a schematic side view of a printing machine utilizing the platen of the invention;

FIG. 3 is a geometric oblique view illustrating the formation of the platen side contour.

DESCRIPTION OF THE INVENTION

FIG. 1 shows the workpiece 1 fixed to the work support 2 in position for milling by the milling cutter 3. Cutter 3 is positioned with its axis *a* vertical and is driven by the usual drive mechanism (not shown) within the drive head 4, which is supported by pedestal 5 from the machine frame (not shown). The work support 2 is rotatively supported in the upwardly extending parts 6 and 7 of the slide 8, which is slidably supported on the usual horizontal rails 9. The sliding movement (translation) along rails 9 is parallel to the rotation axis Z of the work support 2 and the axis *a* of the cutter 3 intersects this axis and is perpendicular to it. The work support is moved angularly about the axis Z and this movement is related to the translational feed movement, in the manner now to be described.

Shaft 11 of work support 2 carries gear wheel 10 which rotates the work support, and gear wheel 10 is driven by a rack 12 which slides horizontally and transversely of the slide 8, moving at right angles to both the cutter axis *a* and the work support axis Z. Rack 12 is secured to transversely movable block 13 which slides on the slide 8, being guided by dovetail gibs 14. A crank disc 15 is utilized to coordinate the rotary and translational feed movements, being carried on shaft 16 rotatively journaled in housing 17 supported by pedestal 18 from the machine frame (not shown). A crank pin 19 connects disc 15 and block 13 so that the block moves in a circle as the shaft 16 turns. Shaft 16 may drive the elements or may be idle, so as to determine the feed movement produced by the usual handwheels or other work feeding means. The crank disc and block may have a number of different locations for receiving the crank pin 19, thus providing for producing circular movement on any desired radius. In addition, pin 19 may be so connected to disc 15 so that block 13 describes a path other than circular.

The workpiece 1 has a cylindrical upper surface 20, which is concentric about the axis Z, and which will support the blanket 22 of the printer. The workpiece is moved rotatively, so that the cutter axis *a* will trace a path on this surface which ap-

proximates the outline of a circle applied to or wrapped around the cylinder. Where the pitch circle of gear 10 has the same radius as cylinder 20, the path traced will be circular, the path becoming increasingly elliptical as the pitch circle radius is increased (minor axis running peripherally) or decreased (major axis running peripherally). Ordinarily, the pitch circle of gear 10 may have a radius which exceeds that of cylinder 20 by the thickness of the blanket 22 with which the platen is to be used.

The platen may be used in a lid printer such as shown in my previous application Ser. No. 557,423, filed June 14, 1966, now Pat. No. 3,426,941 granted Feb. 11, 1969 or in my previous application Ser. No. 706,429 filed Feb. 19, 1968, since abandoned, to which reference may be made for details forming no part of the present invention and not shown herein. FIG. 2 indicates the plate, blanket and impression cylinders 25, 26 and 27, respectively of such a lid printer. The platens 1 are mounted by means of members 28, 29 on shaft 30 and are rotated so as to bring their blankets 22 successively into operating relation to the plate cylinder 25 and impression cylinder 27 as the cylinder 26 turns. As its leading edge approaches the axial plane or nip of cylinders 26, 27 the platen engages the rim or flange 31 of the lid, which is sitting on the support 32, having been advanced to this position by the machine article-feeding mechanism, not shown. The platen proceeds to feed the lid into the nip, registering it in the process, and the blanket 22 comes into printing relation to the lid surface 21 immediately after the platen's engagement of the flange 31.

As will be noted from FIG. 2, the leading edge of the platen lateral contour 32 engages the lid flange 31 while it is in vertical position (parallel to the axial plane of the blanket and impression cylinders) and spaced from the nip or axial plane (distance *x*). This relationship of elements provides an optimum feeding and registering action and may be controlled in a very simple manner as hereinafter described. In a machine with 6 inch diameter cylinders a distance *x* of about 3/16 inch has been found satisfactory.

FIG. 3 shows schematically, the mode of generation of the platen contour. In the figure, there is indicated a quadrant of the platen (all four quadrants being identical apart from orientation), or, rather the geometric elements to which it relates. S indicates a cylinder, real or supposititious, concentric about the axis Z, and to which there has been applied a quadrant of a circle C. The conoid contour traced by the cutter axis is indicated by the rulings *a*1, *a*2, etc., indicating successive positions of the cutter axis contacting both the axis *a*Z (at point *a*1, *a*2, etc.) and curve C (at points P1, P2, etc.), while remaining perpendicular to the axis Z. The actual cutter contour will be spaced inwardly from this surface, being parallel thereto, by the radius of the cutter 3, which radius equals the distance *x*, previously mentioned.

While the invention has been described and illustrated with respect to a certain preferred embodiment which gives satisfactory results, it will be understood by those skilled in the art after understanding by those skilled in the art after understanding the purpose of the invention that various other changes and modifications may be made without departing from the spirit and scope of the invention, and it is therefore intended in the appended claims to cover all such changes and modifications.

I claim:

1. A blanket-carrying platen for dry offset printing in machines handling articles having an upstanding flange around them and substantially a flat surface to be printed, the said platen comprising a substantially cylindrical blanket carrying outer surface which conforms to the outline of the surface to be printed, and a side surface contour parallel to a right conoid surface generated by a line which is in contact with and at right angles to an axis concentric to said cylindrical surface and in which the leading edge of the side surface contour is spaced circumferentially from a radius of said cylindrical surface but parallel to said radius, whereby the said

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leading edge of the side surface contour is parallel to the common axial plane of a printing cylinder carrying said platen and

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a cooperating impression cylinder, while still spaced from the printing point.

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