Jan. 3, 1967 H. J. DEVON 3,295,443

PRINTING PLATE FOR ROTARY PRINTING DRUMS AND ATTACHMENT MEANS THEREFOR

Filed June 23, 1964

FIG. 1.

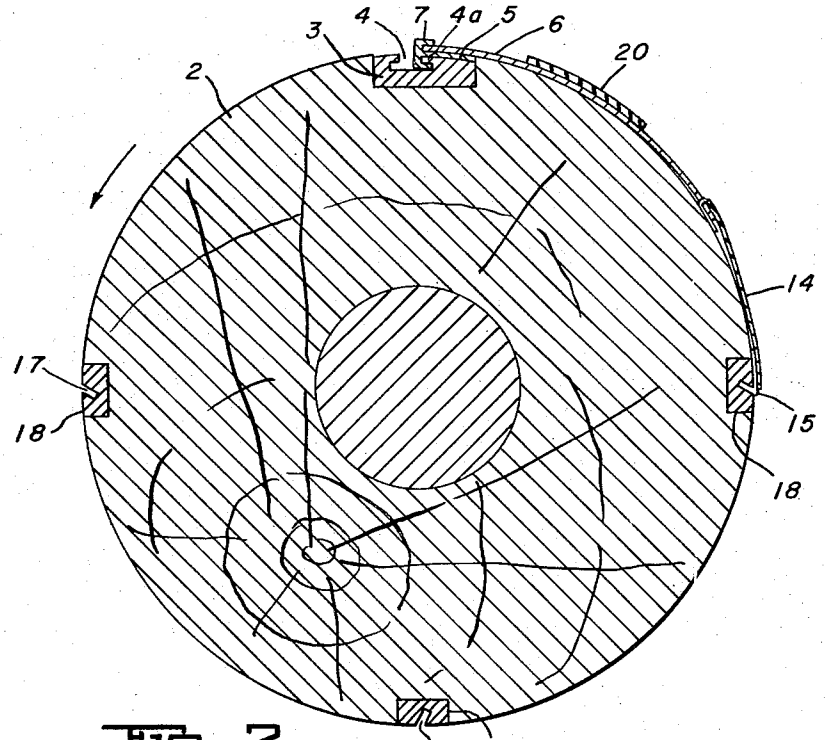


FIG. 2.

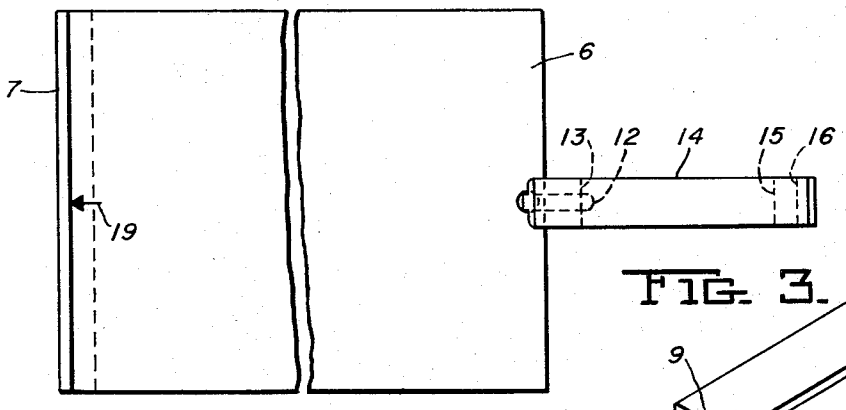


FIG. 3.

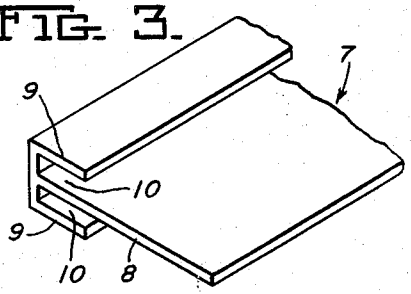
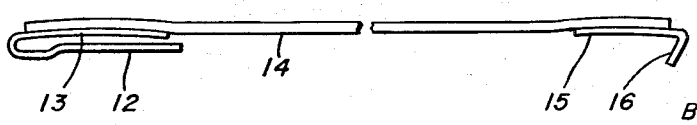


FIG. 4.



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3,295,443

PRINTING PLATE FOR ROTARY PRINTING DRUMS AND ATTACHMENT MEANS THEREFOR

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1 Claim. (Cl. 101—376)

This invention is for a printing plate designed to be mounted on a printing roll and especially large printing rolls used in printing on boxboard or carton blanks.

In certain types of printing operations, as for example the printing on corrugated boxboard and the like, the printing apparatus embodies one or more printing rolls beneath which a web of boxboard is passed and on which printing is applied to a selected area or areas at regular intervals, after which the web is scored and cut to produce individual carton blanks in succession.

The printing drums of such machines are generally quite long and of large diameter. The printing is accomplished by a rubber mat or block having the desired characters on its outer face and which in turn is cemented to a supporting plate which is flexible to the required extent but is not stretchable. The plates are of larger area than the printing block or mat. They are flat when the printing mat is attached thereto, but when they are applied to the printing, the plate is curved to conform to the curvature of the printing roll and snugly fit its surface.

Since the box or carton blank is only cut and scored and severed from the web after the printing has been applied, and since, where there are two or more printing rolls in succession for multicolor printing, it is necessary that the printing plates be located at exactly the right position on the drum. At the same time it is necessary that the printing plates be frequently changed but retained for reuse because the "runs" on any one printing are relatively small, but with repeat orders from time to time. To assure proper positioning of the plates on the rolls, each printing roll or drum has a single slot extending lengthwise therealong into which the leading edge of the plate is engaged. Various arrangements are provided for pulling the trailing edge tight and anchoring to the printing roll, some rolls utilizing elongated rotary shafts set in the roll and used as winches. Turnbuckle arrangements and other devices requiring considerable labor, cost or time are used.

The present invention provides an improved plate and simple fastening means which is inexpensive and permits rapid change to be made with assurance of accurate positioning.

According to this invention the lead edge of the plate may be provided with a combined hook and guard for engaging in the slot above referred to. The periphery of the drum has other reversely-sloped slits parallel with the aforesaid slot at intervals around its surface, and the trailing edge of the plate has elastic strips attached thereto, the free ends of these strips having hooks that may be clipped into one of these slits and exert a continuing tension on the plate, as will hereinafter be more fully understood.

The invention may be more fully understood by reference to the accompanying drawing, in which:

FIG. 1 is a transverse section through a printing roll with a type-carrying plate embodying the present invention attached thereto, but in which, for purpose of illustration, the mat and its attaching means is exaggerated in size as compared to the roll;

FIG. 2 is a plan view of the plate detached from the roll;

FIG. 3 is an isometric view enlarged over its actual size of the attaching strip at the lead edge of the plate, showing the strip on a larger scale; and

FIG. 4 is a side elevation of the elastic attaching strip.

In the drawing, 2 designates a printing roll of the type used in printing carton blanks. Sometimes they are made of wood, and sometimes of metal. If it is made of wood, it has a metal strip set in its periphery extending the full length of the roll, and which has a specially shaped groove or slot therein, whereas if the drum is made of metal, the groove may be cut directly in the roll, or an insert strip as used with wooden rolls may be used. I have indictaed in the drawing a wooden roll with an inserted metal strip 3 in its periphery. While here indicated to be made of one piece, it is actually of the order of twenty inches in diameter and made from separate pieces in a manner well known in the art and not material to this invention. This strip has a longitudinal slit 4 therein with the bottom of the slot widened out to leave a thin rabbetted tongue 4*a* along one and preferably both edges of the slit. Assuming the roll rotates in the direction of the arrow in FIG. 1, the surface of the tongue 4 is countersunk at 5 slightly, about 1/32 of an inch, for example, below the periphery of the roll.

The printing plate 6 is usually a sheet of tough fiberboard, or fiber-reinforced plastic or the like, being strong, tough, originally flat, and capable of being flexed to conform to the curvature of the printing roll surface. On this plate there is cemented a rubber printing pad or block 20 with the design, letters or other indicia to be printed raised above its surface, this being a usual and widely used construction.

With this invention there is an extruded strip 7 preferably of plastic, but which may be of metal secured to the leading edge of this plate. The strip is in the form of a double channel with a common dividing wall 8 which is thin and extends well beyond the outer side walls 9 of the two channels 10. The leading edge of the plate 6 is snugly fitted into the upper or outermost channel 10 and the thin central wall 8 provides a fin or apron that extends well under the plate, providing a good surface for cementing or stapling the plate to the channel to prevent separation. A strong plastic adhesive may be used on the fin or apron and the contacting surface of the plate to provide such a connection.

The inner or lower channel 10 of the edge strip is designed to be hooked over the lead tongue or edge 4*a* of the roll or roll insert 3 while the fin or apron 8 is received in the countersunk surface 5.

The strip 7 provides not only a hook for attaching the lead edge of the plate to the drum, but by reason of its edge being received in the outer channel 10 there is provided a protection for the edge of the plate to keep it from fraying or chipping or breaking with repeated use and handling.

One or more holes are punched through the trailing edge of the plate. This hole serves to receive a fastening hook or clip 12 on a metal terminal 13 which is vulcanized to a strong elastic strip or rubber tape 14 which is several inches long. On the other end of the resilient tape there is vulcanized a metal terminal 15, the free edge 16 of which is bent downwardly at an acute angle, forming a reversely-sloped narrower tongue. At intervals around its periphery the drum has narrow slits 17 parallel with the slot 4, which in a wooden roll are provided in metal strips 18 set into the periphery of the roll, but which in a metal roll may be cut directly in the roll, these slits being at an acute angle to a radius of the roll passing through it with the bottom of the slit being ahead of the opening at the periphery in the direction of the drum's rotation, and being at an acute angle to a radius drawn

from the center of the drum through the periphery of the drum at the slit. This slit is just large enough that when the strip **14** is stretched, the tongue or flange **16** may be hooked into the slit. At such time the clip **12** will be engaged in the hole in the plate so that the stretched resilient tape will exert a constant tension of many pounds on the trailing edge of the printing plate to hold it tight and immovable on the drum.

With a small pad, a single elastic strip may be sufficient, while a larger pad may require more than one strip, and often several of them. The length of the elastic strip is usually less than the length of the arc between slits **17**, but long enough to be stretched a distance greater than the length of such arc so as to assure a condition where, in the use of the strip, it is always under tension, but at the same time not excessively or needlessly long. Typically it is of the order of six inches in length, but this is not critical, and they can be provided in different lengths.

The metal terminal **13** is tempered brass or similar thin strong metal with the clip **12** formed as an integral part, the bight of the hook between the clip and the flat terminal being just enough to accommodate the thickness of the plate. Once the clip has been hooked through the opening in the plate, the tension on the elastic strip keeps it in place, but when desired the strip may be readily removed for reuse on another plate.

The invention provides a unique, inexpensive and convenient printing plate and attaching means for securing it to a printing drum and an arrangement wherein one plate may be quickly removed and replaced with another. The plastic strip protects the leading end of the plate from being mutilated and provides a square edge for contact with the tongue **4** and holds the plate from skewing around. As is customary in the art, there is a center mark **19** on the leading edge of the plate to enable the plate to be set accurately with respect to the center line of the roll.

While I have shown a preferred embodiment of my invention, changes and modifications in the detail design and construction of parts may be made within the contemplation of my invention.

I claim:

A printing plate for application to a printing roll comprising a flat sheet of fiberboard which may be bent to the curvature of the roll on which it is to be used and on which a rubber printing element is secured,

means at the leading edge of said sheet comprising a strip providing two channels with a common separating web therebetween forming an apron of greater length than the outer side walls of the channels,

said sheet having its leading edge confined in and protected by one channel with the end portion of the sheet resting on and being secured to said apron,

the other channel providing a hook to engage in a slit in the printing roll,

and a resilient rubber strip attached to the opposite end of said sheet having means at its free end for engagement in a slit in a printing roll to which the plate is applied and exerting tension on the plate when said leading edge is engaged in the slot in the printing roll.

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