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H. F. JAMES

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PRINTING MAT

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Fig. 1.

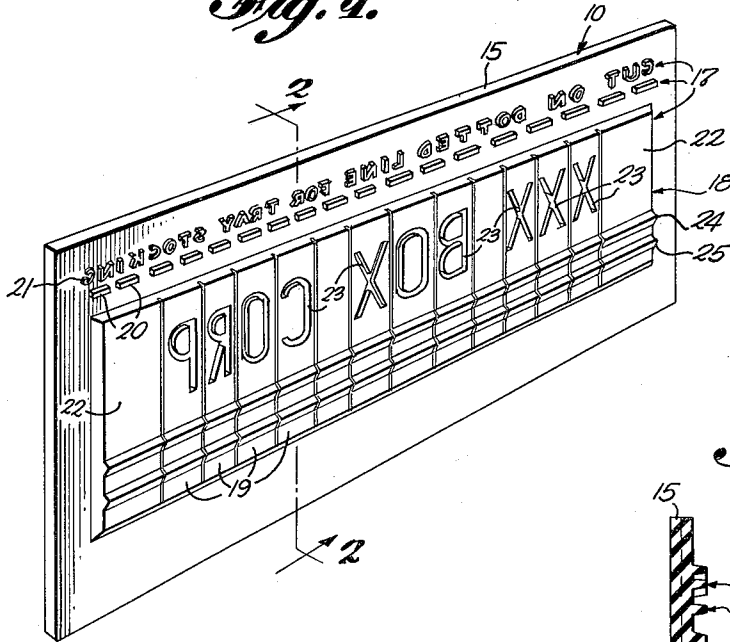


Fig. 2.

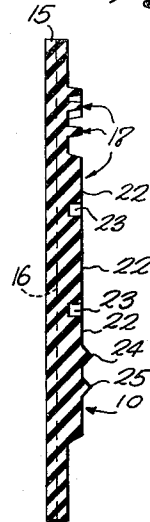
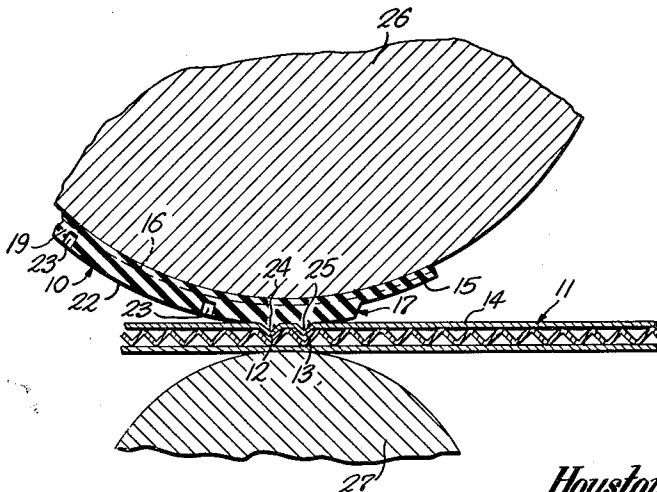


Fig. 3.



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PRINTING MAT

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4 Claims. (Cl. 101—376)

The present invention relates in general to printing mats, and more particularly to roller printing mats formed of flexible material for printing indicia on corrugated shipping container surfaces having scores or indentations extending transversely to the direction of progression of the mats along the printing surface.

It has become a popular practice in recent years in self-service retail establishments, particularly in the supermarket trade, to use corrugated containers in which case quantities of canned goods are shipped as trays for half-case lots of the cans. This is usually practiced by cutting the center portions of the sides and ends of the shipping cartons along a pair of vertically spaced horizontal planes between and parallel to the top and bottom of the carton. The top and bottom may then be used as a tray for half case lots of the cans so that the stacker can readily place trays of such half case lots on the shelf rather than conducting a can-by-can stacking operation. Similarly, bottom trays have been formed for whole case lots of the cans or other individual containers from the shipping cartons by cutting the shipping carton along a single plane paralleling and spaced a short distance upwardly from the bottom. This practice however, has made it desirable to relocate the advertising matter, shipping instructions, or other indicia customarily found on shipping cartons nearer to the bottom and/or top so that the printed matter will not be mutilated when the trays are formed.

Manufacturers of the printing mats for applying such printed matter to shipping carton blanks have experienced considerable difficulty in making mats, even mats which are individually hand cut, which will satisfactorily print down to and over or through the horizontal scores provided on such blanks defining the fold or hinge lines along which the flaps forming the top and bottom of the carton are folded. Such printing mats are customarily formed of rubber or rubber-like material adapted to be stapled or otherwise affixed to a large printing roller, the blanks for the shipping cartons being advanced by a conveyor between the mat-supporting roller and a companion pressure roller to imprint the indicia or other printing matter on the upper surface of the blank. The patterns or indicia to be printed on the blank are formed of raised characters or print type portions projecting from the backing panel portion of the mat. If no special provision is made for printing through the scored zones of the blank, such conventional mats would invariably produce a streaked application of ink in the region of the scores and fail to uniformly apply ink to the depressed surface portions of the blank caused by the scores. Attempts have been made to overcome this difficulty by increasing the pressure on the printing roller sufficiently to bend the printing mat into the indentations caused by the scores or by affixing pieces of wire or other rigid material to the backing of the printing mat to increase the pressure over the score areas. However, both of these expedients cause a stretching of the mat resulting in distortion of the print type itself.

An object of the present invention, therefore, is the provision of a novel printing mat of rubber-like material for roller imprinting of indicia on printing surfaces having indentations such as scores and the like therein, wherein means are provided for imprinting over or through the indentations with a uniform application of ink.

Another object of the present invention is the provision of a novel rubber printing mat for printing roller adapted to imprint indicia on a surface of corrugated shipping

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carton blanks and the like having indentations caused by scores extending generally transversely to the direction of feed of the blanks, wherein raised ridges are provided on print type on the mat corresponding to the position of the indentations on the blanks to effect uniform application of ink on the indented surface portions as well as the undistorted surfaces of the blanks and avoid streaking of the scored zones of the blanks.

Another object of the present invention is the provision of a novel rubber printing mat for printing rollers adapted to imprint indicia on a surface of corrugated shipping carton blanks and the like having indentations caused by scores extending generally transversely to the direction of feed of the blanks, wherein raised means are provided on the print type portions of the mat at positions to extend into the indentations on the blanks and effect uniform inking of both the undistorted and indented surface portions of the blank without stretching of the mat in the region of the scores.

Other objects, advantages and capabilities of the present invention will become apparent from the following detail description taken in conjunction with the accompanying drawing illustrating a preferred embodiment of the invention.

In the drawing:

FIGURE 1 is a perspective view of a rubber printing mat embodying the present invention;

FIGURE 2 is a vertical transverse section view of the printing mat taken along the line 2—2 of FIGURE 1; and

FIGURE 3 is a vertical transverse section view of the printing mat embodying the present invention assembled on a fragmentary portion of a printing roller and shown in printing engagement with a scored corrugated blank.

Referring to the drawing wherein like reference characters designate corresponding parts throughout the several figures, a rubber printing mat constructed in accordance with the present invention is indicated generally by the reference character 10, which in the specific example herein described is designed to imprint on a corrugated blank 11 shown in FIGURE 3 certain advertising matter, shipping instructions or other desired information. In this example, the corrugated blank 11 is a blank for shipping cartons for case lots of canned goods, and in accordance with conventional practices is provided with scores 12 and 13 which extend transversely of the direction of feed of the cartons along a conventional conveyor at a suitable location to define a fold line along which the bottom and/or top flaps of the corrugated case are to be folded in erecting the case. In this example, the printed information is designed to be imprinted on the portion of the upwardly facing surface 14 of the blank 11 immediately adjacent and extending into or partially through the scores 12, 13 so that the printed information, or at least the identification of the manufacturer or brand names, will be visible and unmutated on the sides of the tray when the shipping carton is cut parallel to the bottom to form a tray for a case lot or a half case lot of the canned goods.

The printing mat, in accordance with conventional practice, has a generally rectangular backing panel portion or base 15 which may be suitably reinforced, if desired, by reinforcing fabric or the like indicated at 16, and is provided with integral raised printing formations 17 projecting from the backing panel portion to be coated with ink or other suitable printing medium by a conventional inking roller and transfer the ink to the surface 14 of the corrugated blank 11 by contact with the latter during advancement of the blank along a conveyor. The raised printing formations 17 of the exemplary printing mat illustrated in the drawing, has several different kinds of print type members including a row 18 of intaglio print type members 19, a line of

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raised dash-forming print type members 20, and a line of raised character type members 21 to provide imprinted instructions that the carton is to be cut along the line of dashes formed by the members 20 to form a stocking tray. The intaglio type members 19 in this example have raised printing surfaces 22 of rectangular outline into which countersunk recesses or depressions 23 are formed for producing characters or figures in relief on a uniformly printed background. If it were desired to extend imprints to be formed on the carton sides, such for example as the intaglio background imprints, down into or through the scored areas of the carton surface 14, a flat surface on the printing mat would not produce a uniform transfer of ink to the carton surface, as the surface of the print type members would skip over parts of the depressed surface of the blank at the scores and produce streaks in the scored zones.

To avoid streaking or disfiguring of the imprint over the scored area of the carton blank, the printing mat of the present invention includes raised ridges 24, 25 on the print members 19 conforming in position and thickness to the locations and depth of the scores 12, 13 to extend into the depressions formed by the scores and engage the blank surface in the scores with the same pressure as that applied by the rest of the type member printing surfaces to the unscored portion of the blank surface 14. In this example, since the scores 12 and 13 are arranged as a parallel pair of closely spaced scores extending transversely of the direction of feed of the blanks on the conveyor, the ridges 24, 25 are similarly spaced parallel raised ridges on the lower portions of the intaglio type members 19 and extend the full width of the row of intaglio type members. By this arrangement, uniform ink transfer pressure is maintained over all parts of the mat which come into contact with the surface of the blank to effect a consistent transfer of ink to both the depressed surfaces of the scores and the undistorted surface portions of the blank, and stretching of the mat upon contact with the scored regions of the blank which would produce streaks adjacent the scores is avoided. It will be apparent that use of such raised ridges for the purposes described on the print type members is not limited to use with intaglio raised type formations as herein shown, but that similar raised ridges may be formed on the raised printing surfaces of raised characters or designs of any kind which are to produce ink or color imprints which extend into or through scored zones of blanks to avoid streaking or disfiguring of the imprint.

In the use of the printing mat of the present invention, the printing mat 10 is stapled or otherwise affixed to the surface of a large printing roller, indicated at 26 in FIGURE 3, which is rotated in synchronized relation to advancement of the carton blanks 11 along a suitable conveyor (not shown) so that the raised print type members 17 on the mat 11 are brought into contact with the upwardly facing surface 14 of each carton 11 in a well-known manner to transfer ink to the surface 14. A conventional adjustable roller 27 is also provided below the feed path for the blanks to maintain a uniform contact pressure between the blank surface 14 and the printing surfaces of the mat 11. When the blank 11 had scores such as the transverse scores 12 and 13 in the surface to be printed and the ink or color to be imprinted on the blank is to extend into or through the scored area, it was necessary, prior to the present invention, to increase the pressure exerted by the printing roller 26 on the blank 11 sufficiently to bend the mat into the indentations caused by the scores, or to affix wires or other rigid backing elements to the back of the mat to increase the pressure over the scored areas. Each of these expedients would cause a stretching of the mat resulting in a distortion of the print type members, which could produce streaking or other distortion of the imprints formed on the surface of the blank. However, with the present invention, the raised ridges 24, 25 conform to the spacing of the scores 12 and

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13 and to the profile of the indentations produced by such scores so that the ink or printing medium on the printing surfaces of the type members 17 is transferred by uniform pressure to all parts of the blank surface 14 engaged by the type members including the indented surfaces produced by the scores without any stretching of the mat, thereby preserving the clarity, straight form and uniformity of color of the imprinted characters or designs on the blank.

While but one preferred example of the present invention has been particularly shown and described, it is apparent that various modifications may be made therein within the spirit and scope of the invention, and it is desired, therefore, that only such limitations be placed on the invention as are imposed by the prior art and set forth in the appended claims.

What is claimed is:

1. A carton blank printing mat of rubber material and the like for applying designs to a scored print-receiving surface of a carton blank during movement of the blank adjacent a printing roll wherein the imprinted design extends into indentations in the print-receiving surface caused by scores therein, said mat including a rubber backing panel portion adapted to be secured against a surface of a printing roll, a plurality of raised printing type elements integrally formed with said backing panel portion and projecting therefrom to be rotated into contact with the blank having working faces to be pressed into contact with said print-receiving surface and apply a uniform density of printing medium over all flat print-receiving surfaces of the blank contacted thereby, and said raised type elements having raised ridges projecting outwardly therefrom conforming to the profile of the indentations in said print-receiving surface produced by said scores and coordinated with the location of said scores to project into said scores and apply a uniform density of the printing medium to the scored surface contacted thereby corresponding to the density applied to the flat portion of said print-receiving surface.

2. A carton blank printing mat of rubber material and the like for applying designs to a scored print-receiving surface of a carton blank during movement of the blank adjacent a printing roll wherein the imprinted design extends into indentations in the print-receiving surface caused by scores therein, said mat including a rubber backing panel portion having a rear surface adapted to be secured against a surface of a printing roll, a plurality of raised printing type elements integrally formed with said backing panel portion and projecting therefrom to be rotated into contact with the blank having working faces spaced equidistant from said rear surface of said backing panel portion to be coated with a printing medium and pressed into contact with said print-receiving surface to apply a uniform density of the printing medium over all flat print-receiving surfaces of the blank contacted thereby, and said raised type elements having raised ridges projecting greater distances from said rear surface than said working faces conforming to the profile of the indentations in said print-receiving surface produced by said scores and coordinated with the location of said scores to project into said scores and apply a uniform density of printing medium to the scored surfaces contacted thereby corresponding to the density applied to the flat portions of the blank surface whereby the resultant print exhibits a uniform density of printing medium over all portions of the print-receiving surface contacted by said printing mat.

3. A carton blank printing mat of rubber material and the like for applying designs to a scored print-receiving surface of a carton blank during movement of the blank adjacent a printing roll wherein the imprinted design extends into indentations in the print-receiving surface caused by scores therein extending transversely of the direction of feed of the blank and substantially spanning the width of the blanks, said mat including a rubber backing panel portion having a rear surface adapted to be se-

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cured against a surface of a printing roll, a row of raised printing type elements integrally formed with said backing panel portion and projecting therefrom to be rotated into contact with the blank over a zone adjacent and extending into the scores of the blank, said type elements having working faces spaced equidistant from said rear surface of said backing panel portion over substantially their entire extent to be coated with a printing medium and pressed into contact with said print-receiving surface to apply a uniform density of the printing medium over all flat print-receiving surfaces of the blank contacted thereby, and said raised type elements having integral raised ridges projecting greater distances from said rear surface than said working faces extending in transverse aligned relation along the row of type elements parallel to the scores to register with all score portions intercepted by the working faces, said ridges being contoured to conform to the profile of the indentations in said print-receiving surface produced by said scores and coordinated with the location of said scores to project into said scores and apply a uniform density of printing medium to the scored surfaces contacted thereby corresponding to the density applied to the flat portions of the blank surface whereby the resultant print exhibits a uniform density of the printing medium over all portions of the print-receiving surface contacted by said printing mat.

4. A carton blank printing mat of rubber material and the like for applying designs to a scored print-receiving surface of a carton blank during movement of the blank

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adjacent a printing roll wherein the imprinted design extends into indentations in the print-receiving surface caused by scores therein, said mat including a rubber backing portion having a rear surface adapted to be secured against a surface of a printing roll, a raised panel of intaglio print type elements extending transversely of the direction of feed of the blank integrally formed with said backing portion and projecting therefrom away from said rear surface, said intaglio printing elements having working faces spaced equal distances from said rear surface to be pressed into contact with said print-receiving surface and imprint uniform density intaglio designs over all flat print-receiving surfaces of the blank contacted thereby to produce imprinted designs in relief, said intaglio type elements having raised ridges transversely spanning said panel of intaglio printing type elements projecting to greater distances from said rear surface than said working faces to conform to the profile of the indentations of said print-receiving surface produced by said scores and positioned in coordinated relation with the location of said scores to project into said scores throughout all score portions traversed by said type elements and apply a uniform density of printing medium to the scored surfaces contacted thereby corresponding to the density of printing medium applied to the flat portions of said print-receiving surface by said working faces.

No references cited.