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ALTERNATIVE PRINT DRUMS FOR APPLYING
INDICIA TO MOVING SHEET
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ALTERNATIVE PRINT DRUMS FOR APPLYING INDICA TO MOVING SHEET

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This invention relates to an indicia applying apparatus and more particularly to a new and improved apparatus for automatically applying indicia to one surface of a moving sheet or web.

A primary object of the present invention is the provision of an apparatus of the type described which includes a pair of indicia applying drums and unique means supporting one drum in an operative position and the other drum in a stand-by position and permitting each drum to be rapidly moved to the position formerly occupied by the other drum.

Another object of the present invention is the provision of an apparatus of the type described which includes a pair of indicia applying drums and locking means for supporting either drum in an operative position and the other drum in a stand-by position, which locking means carries a roller for peripheral engagement with the drum occupying the operative position.

These and other objects and advantages of the invention will become apparent from the following specification disclosing a preferred embodiment which is illustrated in the accompanying drawings, wherein:

FIG. 1 is a fragmentary perspective view showing the indicia applying apparatus of this invention associated with a continuous package forming machine;

FIG. 2 is a perspective view (similar to FIG. 1) showing the sheet material bent away for better illustration of the indicia applying apparatus and showing the indicia applying drums occupying positions intermediate their operative and stand-by positions;

FIG. 3 is an enlarged side elevational view of the indicia applying apparatus;

FIG. 4 is a top plan view of the indicia applying apparatus with certain parts being partially broken away and shown in section; and

FIG. 5 is a vertical section taken generally along the line 5—5 of FIG. 3 with certain parts being broken away and shown in section.

The indicia applying apparatus of this invention is illustrated and described in association with the continuous package forming machine shown and claimed in Jensen et al. application, Serial No. 408,842, filed November 4, 1964. However, it is to be understood that the apparatus of this invention is not to be limited for use in such a machine as the apparatus has equal utility in other machines or devices wherein indicia is to be applied to a moving sheet or web.

The continuous package forming machine in the aforementioned Jensen et al. application includes supporting structure having a pair of parallel, spaced vertically disposed plates 10 and 11. The supporting structure of the machine also includes suitable guide means 12 for supporting and guiding a web or sheet of packaging material, such as polyvinyl chloride. A pressure plate 14 is provided for holding the sheet material 13 in the guideway. Pressure plate 14 is pivotally mounted from a bracket 15 (FIG. 5), which bracket is mounted on a rod 16. Rod 16 has an integral arm 17, which arm in turn is integral with rod 18 journaled in a hub 19 secured to plate 10. Suitable means, such as a weight 20, is secured to rod 16 for establishing the proper amount of pressure on sheet 13 as it passes along the guideway 12. Plate 10 also supports a pair of rollers 21 and 22 for guiding the sheet material.

The indicia applying apparatus of this invention will be seen to include a shaft 25 which carries a sprocket wheel 26 (FIGS. 1 and 2). A chain 27 engages sprocket wheel 26; chain 27 is associated with the drive mechanism of the Jensen et al. continuous package forming machine for rotating shaft 25 in timed relation with the advancing sheet of package forming material.

As noted in FIG. 5, shaft 25 has one end thereof secured in a sleeve 28 by means of a set screw 28a carried by the sleeve and received in a slot 25a in the shaft. Sleeve 28 is rotatably mounted in the bore of a hub 29 by a plurality of ball bearings 30. Hub 29 has a reduced-in-diameter portion 32 fitted within an opening 33 formed in plate 10. Shaft 25 has a coaxial, reduced-in-diameter portion 25b.

A housing 35, having a "race track" shape as indicated in FIG. 3, includes a central through bore 36 (FIG. 5) having a bearing sleeve 37 fitted therein, which bearing sleeve rotatably engages shaft portion 25b. A washer 38 is secured to the free end of shaft portion 25b by a fastener 39; washer 38 engages bearing 37 thereby to prevent separation of housing 35 from shaft 25. As noted in FIG. 5, bearing 37 includes an integral outwardly extending flange which engages an annular shoulder formed in the bore 36. It will be understood that housing 35 is mounted on shaft 25 for rotation relative to the latter about the longitudinal central axis of the shaft.

Housing 35 includes a cavity 41 receiving a gear 42, which gear is suitably fixed on shaft portion 25b for rotation with the latter. Housing 35 supports a pair of indicia applying drums generally designated 43 and 44. As drums 43 and 44 are of identical construction and are supported from housing 35 by identical construction, only one drum, namely drum 44, and its associated supporting structure will be described in detail.

As noted in FIG. 5, housing 35 includes a bore 46 opening at one end thereof into cavity 41. A bearing sleeve 47 is fitted in bore 46, which bearing rotatably mounts an axle 48. Axle 48 has a reduced-in-diameter portion 48a on which a pinion 49 is fixed. Pinion 49 meshes with the teeth on gear 42 for being driven by the latter.

A type carrying hub is supported on axle 48 in adjacent relation with housing 35. Hub 50 includes a central bore 51 receiving shaft 48. Hub 50 also includes an axially extending groove 52 communicating with bore 51. Axle 48 mounts a radially extending pin 54 having an end thereof received in groove 52; pin 54 causes hub 50 to be rotated by shaft 48. Pin 54 is slidable in groove 52 thereby to permit removal of hub 50 by sliding the same along axle 48 from housing 35. It will be understood that hub 50 includes one or more annular grooves suitably configured for receiving type or other indicia applying elements.

Hub 50 is detachably secured on axle 48 by a removable cap 56, which cap has a central bore 57 in which the outer portion of the axle is received. Cap 56 includes a radially extending bore 58 closed at the outer end thereof and opening at the other end thereof into bore 57. Bore 58 houses a coil spring 59, which acts as a small ball 60 and urges the latter into an annular groove 61 formed in axle 48. Spring 59 is secured within bore 58 and ball 60 is in turn secured to spring 59 to prevent separation of these parts upon removal of cap 56 from axle 48. It will be apparent that the engagement of ball 60 within groove 61 detachably secures hub 56 in place; cap 56 abuts hub 50 for detachably securing the latter on axle 48.
3. From the foregoing, it will be apparent that upon rotation of shaft 25 (with housing 35 held stationary), gear 42 will be rotated for simultaneously rotating both indicia applying drums 43 and 44. The means for holding housing 35 stationary will be described hereinafter.

At this time it should be mentioned that the axes supporting drums 43 and 44 are parallel with and equidistant from shaft 25. Also, the axes of rotation of drums 43 and 44, defined by the longitudinal central axes of the axes, are coplanar with the longitudinal central axis of shaft 25. Furthermore, housing 35 is symmetrical with respect to the plane containing all of these axes.

Plate 10 mounts a pair of members 64 and 65 in parallel inclined relation. These members have right angled cross-sections and are arranged for defining a guideway with plate 10, which guideway slidably supports a rectangular cross-section bar 66. Bar 66 has an integral extension 66a at its upper end, which extension includes a generally planar surface 66b. When bar 66 is slid upwardly to the position illustrated in FIG. 3, surface 66b abuts either planar surface 35a or 35b, which last mentioned surfaces constitute portions of the outside surface of housing 35.

Bar extension 66a includes a bore 68 (FIG. 4), receiving one end of a bolt 69; bore 68 has an enlarged portion for receiving the head of bolt 69, which head is flush with the inner surface of bar 66 so as not to interfere with sliding movement of the latter. The threaded end of bolt 69 is threadingly received in a bore 70 extending through the center of a cylindrical member 72.

A cylindrical handle member 74 has a reduced-in-diameter portion 74a one end of which is threaded and threadingly received in an enlarged bore 70b communicating with bore 70. Reduced-in-diameter portion 74a of the handle 74 rotatably mounts an ink jet roller 75. This roller includes a continuous peripheral ink carrying member 75a of suitable construction, which member is adapted to engage the type on either of drums 43 or 44 for applying ink to the type thereby to prepare the latter for applying indicia to the moving sheet of material 13.

Means are provided for releasably securing bar 66 along the guideway defined by members 64 and 65. These means include a pin 78 having a reduced-in-diameter end portion 78a suitably fixed in a bore 79 formed in bar 66. The inner end of portion 78a is flush with the inside surface of bar 66 and therefore does not interfere with sliding movement of the latter. Pin 78 projects outwardly between members 64 and 65 and is threadingly received in a threaded blind bore 79c formed centrally in a knob 82. The inner end of knob 82 abuts a washer 83 which is also carried by pin 78 and slidably engages both members 64 and 65. It will be apparent that bar 66 may be frictionally secured in any desired location along the guideway by threading knob 82 on pin 78. Release of the bar 66 for sliding movement is obtained by unscrewing knob 82.

As mentioned above, the axes of rotation of drums 43 and 44, these axes being defined by the longitudinal central axes of the supporting axes, are parallel with and equidistant from the axis of rotation of housing 35, which axis is defined by the longitudinal central axis of shaft 25. All of these axes are coplanar, and housing surfaces 35a and 35b are parallel with and equidistant from the plane containing the axes of rotation of the housing and both drums. Roller 75 is mounted on bar 66 such that when surface 66a of the latter is in abutting engagement with housing surface 35a, the periphery of roller 75, and continuous ink member 75, engages the housing on the upper or operative drum 43. Inking member 75 prepares or inks the type on drum 43 there by to apply indicia to the undersurface of sheet 13 which is engaged by the type on drum 43. The engagement between surfaces 35a and 66a of course prevents rotation of housing 35 and thereby mounts or locks drum 43 in the operative position illustrated in FIG. 3. When 75 the housing is in this position, drum 44 is in a stand-by position. The type carrying hub 50 may be readily removed by un snapping cap 56 thereby to allow the type to be readily changed on hub 50.

When it is desired to change the indicia being applied to the advancing sheet without substantially interrupting either movement of the sheet or the application of indicia, the new type is applied to hub 50 of the stand-by drum, and the hub is mounted on axle 48 and held thereon by snapping cap 56 in place adjacent the hub. Of course, the axis of the stand-by drum will be rotating. However, the angular velocity of this rotation is not so great that the hub 50 cannot be completely on the axle with pin 54 received in groove 52 of the type carrying hub. Friction knob 82 is released and bar 66 is slid downwardly and to the left by grasping handle 74. Housing 35 is then rotated by hand until the positions of the drums are reversed, i.e., until drum 44 occupies the upper operative position and drum 43 occupies the lower or stand-by position. After this is done, bar 66 is slid upwardly and to the right by grasping handle 74. The bar is moved upwardly and to the right until surface 66b thereof abuts housing surface 35b. When these two surfaces are in abutting relation, the housing will again be locked and the continuous ink applying member 75 will engage the type on the upper operative roller 44 thereby to ink and prepare the type on the same for applying indicia to the advancing sheet.

It will be apparent that the invention provides means for readily changing the indicia being applied to the advancing sheet. The change over of the drums can be made quite rapidly during movement of the sheet and with only a very short portion of the latter passing without having indicia applied thereto. It will be understood that in many cases the type on either of drums 43 or 44 does not extend completely around the drums and that the indicia being applied, a date in code for example, is applied to the undersurface of the sheet at intervals so that a date will be located on each package formed. It may be possible to interchange the positions of drums 43 and 44 without interrupting the application of indicia to the undersurface of web 13 depending on the speed of the web and the arrangement of the type on drums 43 and 44.

At this time it should be mentioned that shaft 25 is driven by suitable drive means (not shown) operating in timed relation with the drive means for advancing the sheet, so that the drums have an angular movement which is equal to the velocity of the advancing web. This prevents any slippage between the type and the web which of course could mar or obliterate the indicia being applied thereto.

It is desirable to hold the web rather firmly over the uppermost or operative roller thereby to permit the type on the latter to establish a firm contact with the web. This is accomplished by mounting a backing plate 80 for sliding engagement with the upper surface of the web. Backing plate 80 includes an integral upwardly projecting portion 80c secured to one end of a small plate 81 by one or more fasteners 82. Plate 81 is suitably secured to plate 10 at the upper edge thereof as illustrated in FIGS. 1 and 2. It will be understood that plate 80 slidishly engages the moving sheet directly over the type on the uppermost or operative roller.

While the invention has been shown in but one form, it will be obvious to those skilled in the art that it is not to be so limited. On the contrary, the invention is susceptible of various changes and modifications without departing from the spirit and scope of the appended claims.

We claim:

1. Apparatus for applying indicia to a moving surface comprising, a pair of drums each having peripherally arranged indicia applying means, a first member rotatably mounting said drums with their axes of rotation in parallel.
A pair of drums each having peripherally arranged indicia applying means, a first member rotatably mounting said drums with the axes of rotation in parallel spaced relation, means mounting said first member for pivoting movement about an axis equidistant from and parallel with said axes, all of said axes being coplanar, a second member and means movable mounting the same adjacent said first member, said second member being adapted in one position thereof to engage first member thereby to prevent movement of the latter, a roller carried by said second member for rotation about an axis parallel with said axes, which roller is adapted to prepare said indicia applying means by peripheral engagement of the former with the latter, having said indicia applying means thereon in engagement with said surface of said said, a second member and means movable mounting the same adjacent said first member, said second member being adapted in one location thereof to engage said first member thereby to prevent movement of the latter, said second member being rotatably mounting said drums, a housing mounted on said shaft adjacent said gear for rotation relative to the shaft about an axis of rotation of the latter, a pair of drums each having peripherally arranged indicia applying means, which drums are mounted on respective complementary shaped surfaces, which surfaces are in abutting contact when said locking member is in said one position.

A pair of drums each having peripherally arranged indicia applying means, a first member rotatably mounting said drums with the axes of rotation in parallel spaced relation, means mounting said first member for pivoting movement about an axis equidistant from and parallel with said axes, all of said axes being coplanar, a second member and means movable mounting the same adjacent said first member, said second member being adapted in one position thereof to engage first member thereby to prevent movement of the latter, a roller carried by said second member for rotation about an axis parallel with said axes, which roller is adapted to prepare said indicia applying means by peripheral engagement of the former with the latter, said roller being arranged on said second member so that when the former is in said one position the periphery of the former is engaged with the indicia applying means of one of said drums.

The apparatus according to claim 4 wherein said second member having respective complementary shaped surfaces, which surfaces are in abutting contact when said locking member is in said one position.

The apparatus according to claim 4 wherein said second member having respective complementary shaped surfaces, which surfaces are in abutting contact when said locking member is in said one position.

The apparatus according to claim 5 wherein said housing and said locking member have respective complementary shaped surfaces, which surfaces are in abutting contact when said locking member is in said one position.

The apparatus according to claim 6 wherein the means mounting said locking member include slide means supporting the member for reciprocal movement, and wherein friction means are associated with the slide means for releasably securing the locking means in the slide means.

The apparatus according to claim 6 wherein the indicia applying means includes type and wherein said roller is an inking roller.

In combination with a continuous package forming machine having means for advancing a sheet of package forming material, an apparatus for applying indicia to one surface of said sheet as the latter is advanced, said apparatus comprising, a pair of drums each having peripherally arranged indicia applying means, a first member rotatably mounting said drums with the axes of rotation in parallel spaced relation, means mounting said first member for pivoting movement about an axis equidistant from and parallel with said axes, all of said axes being coplanar, a second member and means movable mounting the same adjacent said first member, said second member being adapted in one location thereof to engage said first member thereby to prevent movement of the latter, a roller carried by said second member for rotation about an axis parallel with said axes, which roller is adapted to prepare said indicia applying means by peripheral engagement of the former with the latter, said roller being arranged on said second member so that when the former is in said one position the periphery of the former is engaged with the indicia applying means of the drum occupying said position.

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