Aug. 16, 1960 E. L. BEATTIE 2,949,079

ROTARY CASE PRINTER

Filed Oct. 3, 1958 3 Sheets-Sheet 1

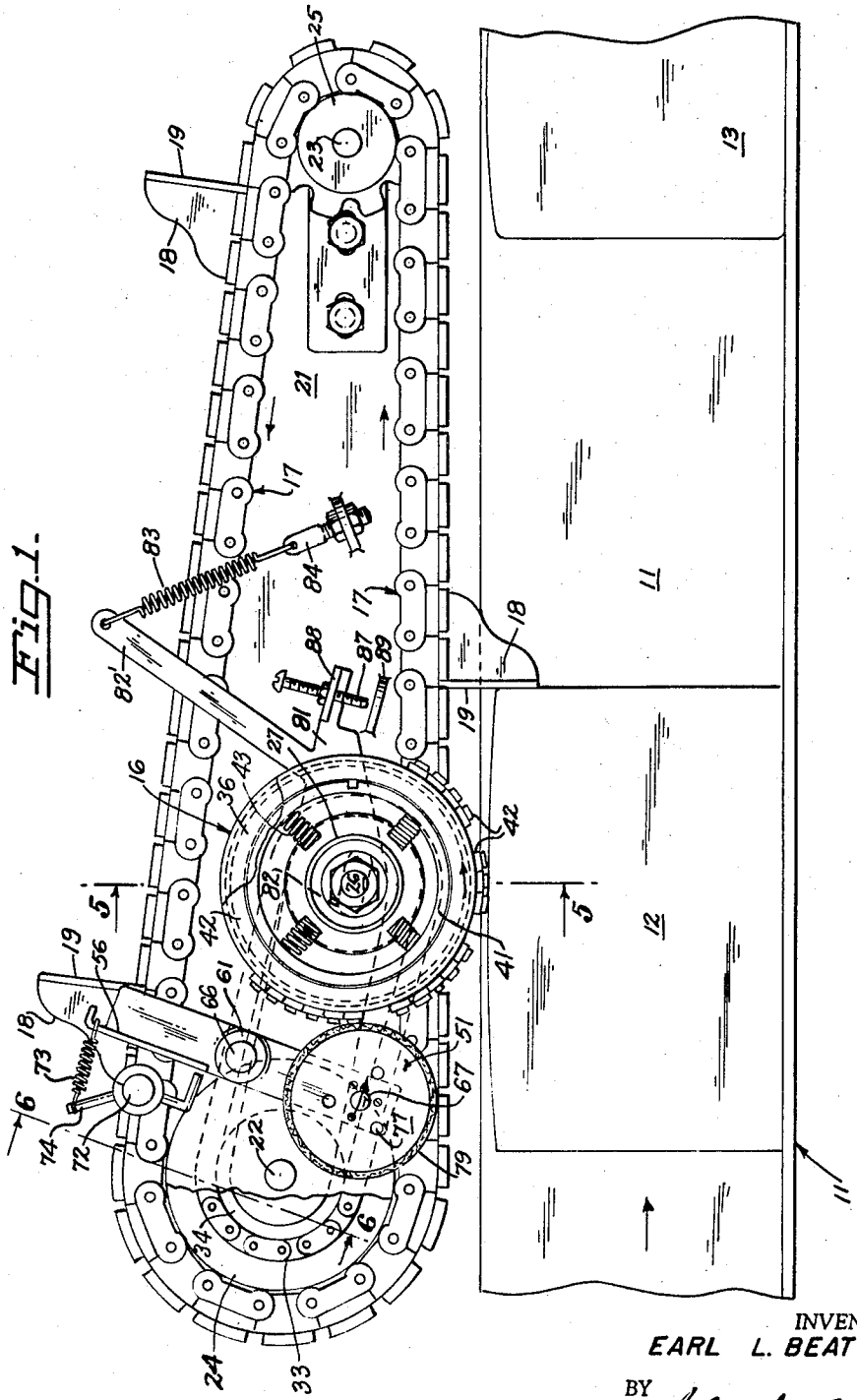


Fig. 1.

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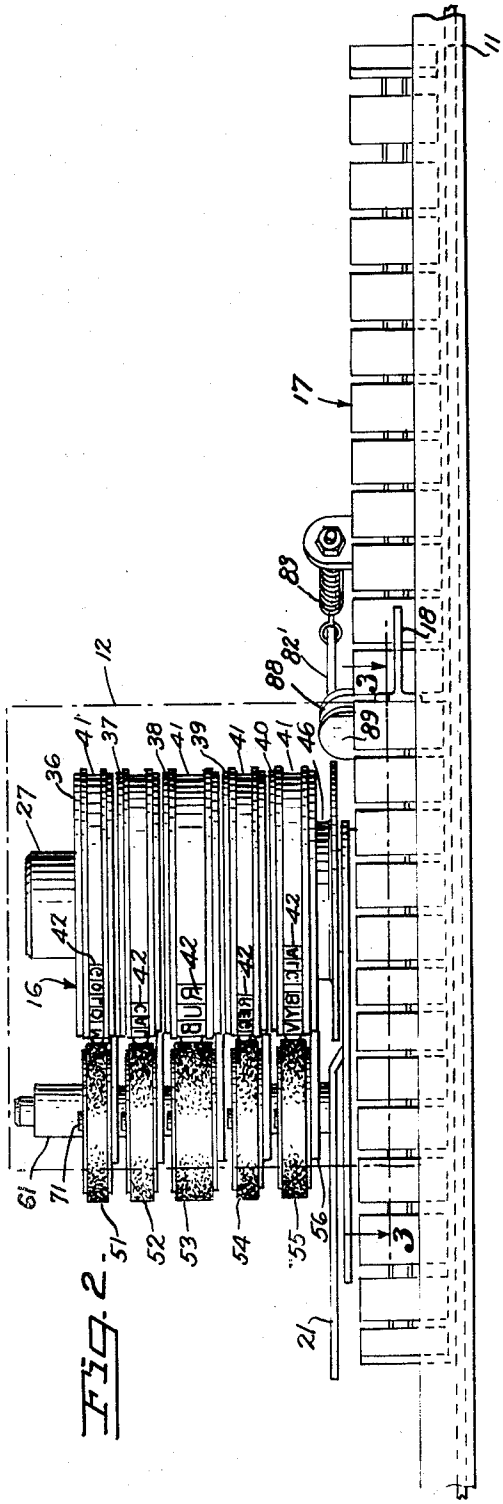


Fig. 2.

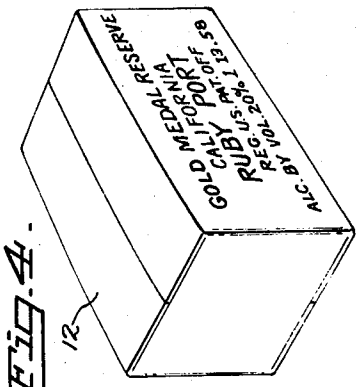


Fig. 4.

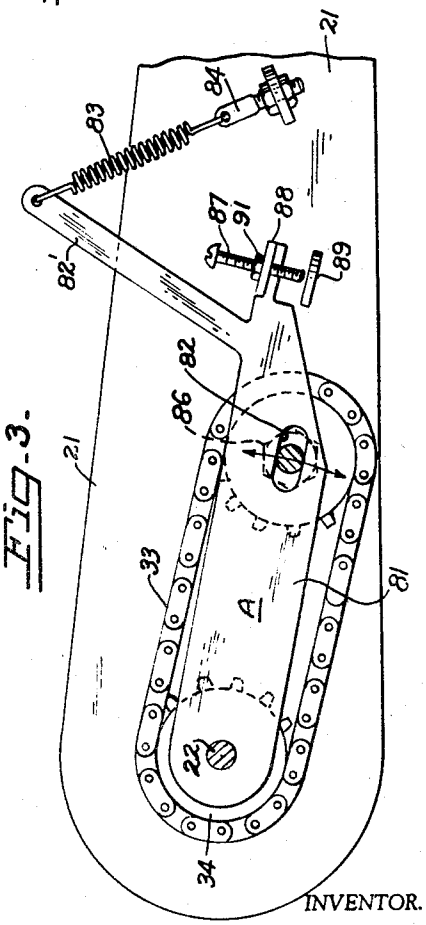


Fig. 3.

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Fig. 5.

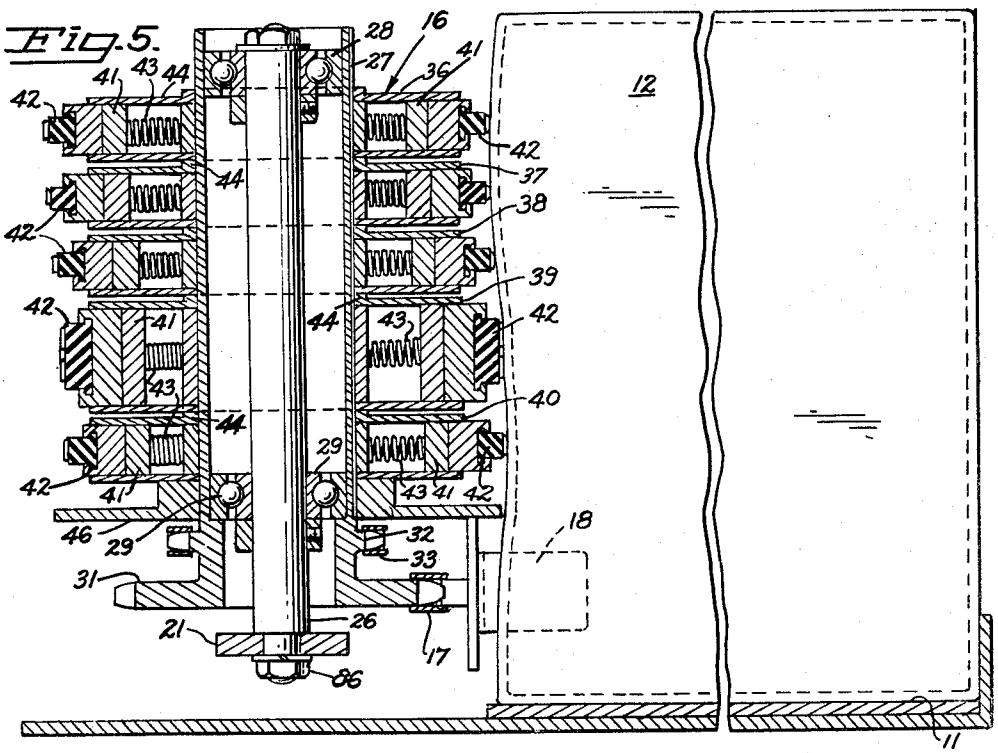


Fig. 6.

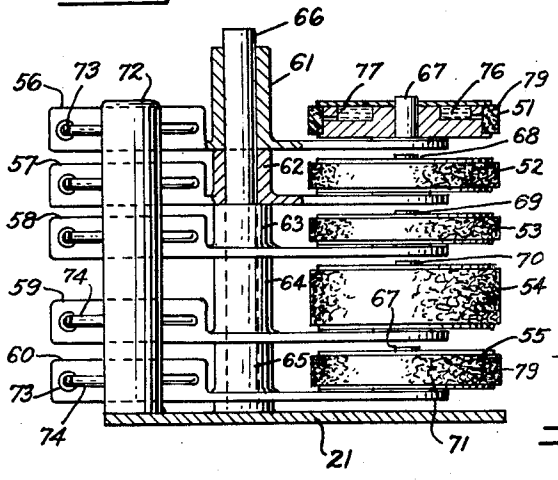


Fig. 7.

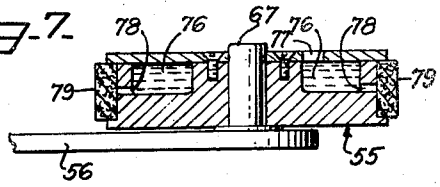
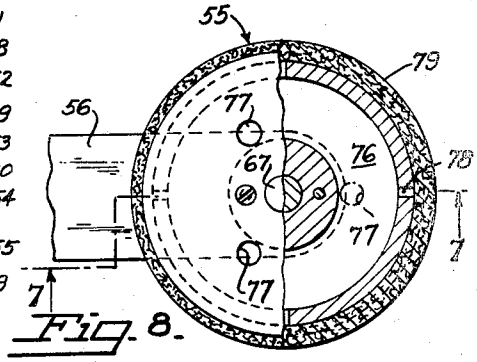


Fig. 8.



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2,949,079

ROTARY CASE PRINTER

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1 Claim. (Cl. 101—35)

The invention, in general, relates to the printing art and more particularly relates to a machine for simultaneously applying a plurality of lines of printing of the same or different color as well as of the same or different size of type to the sides or ends of containers or cases in motion whereby an appreciably increased number of cartons or cases can be print-labeled in a given time interval.

Heretofore in the art, when a number of lines of printing are desired to be applied to a carton, case or the like, it has been the practice to move the cartons past a printing device or several printing devices a number of times in order that the individual lines of printing constituting a complete message can be serially applied. Or, the desired lines of printing have been separately applied manually with printing devices to individual cases or cartons which requires movement of the printing operator or a number of operators, from case to case. In these prior practices, not only are appreciable labor costs involved but also increased case or carton warehousing with attendant handling and added labor costs. In addition, these prior practices involve undue inventory problems. The present invention is directed to the provision of a case printer which is capable of applying the desired number of lines of printing to an increased number of cases with a minimum of labor and in a minimum of time and which obviates all of the disadvantages of prior case printing machines and methods.

A primary object of the invention is to provide an improved case printer which is inherently precise as to location of a plurality of simultaneously printed lines on the sides or ends of cases or cartons and which is inherently flexible as to the size of type as well as the color of the applied printing.

Another important object of my present invention is to provide an improved case printer of the indicated nature which is additionally characterized by its self-contained adjustability so that it applies clear and legible printing not only on smooth but also upon uneven surfaces of a carton, case or the like.

A still further object of the present invention is to provide an improved case printer of the aforementioned character which is inexpensive to manufacture and install and which is relatively inexpensive to maintain.

Another important object of the invention is to provide an improved case printer of the indicated nature which is additionally characterized by the ease in which the multiple lines of type can be varied or changed at the will of the operator.

A still further object of my invention is to provide an improved case printer of the aforementioned character which contains self-inking means for the individual lines of type and wherein color printing combinations can be varied in a matter of seconds.

Other objects of the invention, together with some of the advantageous features thereof, will appear from the following description of a preferred embodiment of the invention which is illustrated in the accompanying drawings. It is to be understood, however, that I am not to be limited to the precise embodiment shown, nor to the precise arrangement of the various parts thereof, as my invention, as defined in the appended claims, can be embodied in a plurality and variety of forms.

Referring to the drawings:

Fig. 1 is a plan view of a preferred embodiment of the invention installed adjacent to a conveyor on which cases are transported and printed during their travel.

Fig. 2 is a side elevational view of the embodiment shown in Fig. 1, this view also showing the belt conveyor on which the cases are transported.

Fig. 3 is a fragmentary sectional view of a preferred embodiment of the invention, this view being taken on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of a case after having been printed by the preferred embodiment of the invention.

Fig. 5 is a vertical cross-sectional view taken on the line 5—5 of Fig. 1, with an exaggerated showing of a warped or uneven end of a case being printed.

Fig. 6 is a front elevational view of the inking rolls of the preferred embodiment of the invention, this view looking in the direction of the arrows designating the line 6—6 of Fig. 1.

Fig. 7 is a cross-sectional detail of one of the inking rolls, this view being taken on the line 7—7 of Fig. 8.

Fig. 8 is a plan view, partly in section, of an inking roll of a preferred embodiment of the invention.

In its preferred form, the case printer of my present invention preferably comprises, in combination with a conveyor upon which cases are moved in spaced relationship, a hub rotatable by each case of a succession of cases on and in response to the movement of said conveyor, a plurality of spring-loaded rings removably disposed on said hub and rotatable in unison therewith; each of said rings carrying a variable line of type, together with a plurality of rotatably mounted ink rollers arranged in alignement with said rings, means for inking said rollers with a desired color of ink, and means for maintaining said ink rollers in engagement with the type carried on said rings.

As particularly illustrated in Fig. 1 of the annexed drawings, my improved case printer is arranged alongside of and is used in combination with an endless conveyor 11, which preferably is a belt conveyor, upon which a plurality of cases or cartons 12 and 13 are removably disposed in spaced relationship for transmission to and past the case printer per se. Conveniently, the arrangement is such that the printer is actuated by each of successive cases as they are moved to and past the printer, thus synchronizing the operation of the printer with the movement of the conveyor which may be rotated in a conventional manner, such as driven by a motor and a belt and pulley drive, all not shown.

In accordance with the present invention, I mount closely adjacent to one side of the belt conveyor 11 a rotatable case printer, designated generally by the reference numeral 16, having means provided therein for applying a plurality of lines of printing simultaneously to either the end or the side of each case or carton as it is moved past the printer by the conveyor 11. Conveniently, the means for rotating the case printer 16 can consist of an endless chain 17 upon which are mounted at spaced intervals throughout its length a series of laterally projecting lugs 18 each having a flat or planar face 19 thereon. The endless chain 17 is mounted for rotation in close proximity to one side of the belt conveyor and at a slightly higher level than the conveyor so that the laterally projecting lugs 18 of the chain overlie a portion of the conveyor, as shown in Fig. 1. As each case or carton 12, 13 etc., etc., of the succession of cases or cartons on belt conveyor 11 is advanced thereby, the leading

end or side thereof, as the case may be, engages the straight face 19 of a lug 18 on chain 17 thereby causing the endless 17 to be rotated which, in turn, effects the rotation of the case printer which is more particularly hereinafter described. The endless chain 17 is conveniently mounted for rotation slightly above a base plate 21 by means of a pair of spaced shafts 22 and 23 upon which are rotatably mounted a pair of sprocket gears 24 and 25, respectively, for meshing engagement with the links of the chain 17. For space requirements, the sprocket wheel 24 is made to a larger diameter than the diameter of sprocket 25, and the resultant path of the endless chain thus affords a relatively wide area at one end for the disposition of other elements.

As particularly illustrated in Figs. 1 and 5 of the annexed drawings, my improved case printer is mounted for rotation on a fixed standard 26 which is firmly bolted to the base plate 21 adjacent to the larger sprocket gear 24. The standard 26 rotatably supports a central hollow hub 27, by means of suitable roller bearings 28 and 29 secured to the standard 26 and confined within the same; the hub 27 carrying a relatively large sprocket 31 at the bottom thereof as well as a smaller sprocket 32 just above the sprocket 31. The hub 27 is driven or rotated by a short endless chain 33 which is trained around the smaller sprocket 32 of hub 27 as well as around a sprocket 34 mounted on the rotatable shaft 22 which is rotated by the endless chain 17; the larger sprocket gear 31 on hub 27 merely engaging in the links of chain 17 as that chain rotates.

In accordance with the present invention, I removably mount upon the main or central hub 27, in superposed spaced relationship and for rotation therewith, a plurality of hollow printing rings 36, 37, 38, 39 and 40; it being understood that any desired number of rings can be mounted upon the central hub 27 as desired and it further being understood that these printings can be interchanged at the will of the operator in a matter of seconds. Each of the printing rings is provided with a central hub having an inner diameter which is slightly larger than the outer diameter of the main or central hub 27 so that a friction fit is effected between the rings and the central hub and the rings will rotate with the rotation of the hub. As shown particularly in Fig. 5 of the annexed drawings, each of the hollow printing rings yieldably carries on its periphery a length of type base 41, which preferably is fabricated of hard rubber and which removably carries individual alphabetical and numeral type 42 also preferably fabricated of hard rubber. Due to the construction of the rings, the type base 41 is fitted within the groove defined by the top and bottom of each of the rings and in order that the type 42 carried by the type base 41 be urged outwardly at all times, I provide in each of the rings a compression spring, or series of compression springs 43 which are confined between the outer surface of the hub of each ring and the inner surface of the type base 41. Whenever the type of a ring engages the side or end of a carton or case being moved along the belt conveyor 41 the pressing engagement of the type on the side or end of the case or carton will compress a spring 43 which immediately reacts to urge the type 42 outwardly against the surface of the case or carton as the case may be. This is particularly advantageous when printing upon a warped or undulating surface of a case or carton, and thus avoids any irregular printing but, to the contrary, maintains bold and effective printing despite the fact that the case or carton surface may not be wholly planar. As indicated in Fig. 5 of the drawings, some of the printing rings of the set of rings mounted upon the hub 27 of the printer 16 are of greater width than others in order that different size type may be used on the different rings with some larger and some smaller size type so as to correspond with the desired message to be printed on the side or end of a case. Conveniently, each of the rings 36–40 inclusive is provided on its bottom with an annular boss 44 which not only serves as a bearing and spacing member but also prevents binding of the individual printing rings one with another during the operation of the printer. As shown, the printer includes a base member 46 on hub 7 which serves as a seat for the first or bottom ring 40.

In addition to the foregoing elements, my improved case printer includes type inking means so that the type 42 on the individual printer rings 36–40 inclusive can be self-inked during the operation of the printer. These inking means preferably comprise a plurality of inking rollers 51, 52, 53, 54 and 55, see Figs. 2 and 6 of the annexed drawings, thus providing an individual inking roller for each of the individual printing rings 36–40 inclusive. While any suitable mounting means may be provided for the inking rollers, I conveniently mount the inking rollers on a plurality of brackets 56, 57, 58, 59 and 60, respectively, which are pivoted by means of integral collars 61, 62, 63, 64 and 65 on a pin 66 secured to base plate 21 and extending normal thereto; each of the brackets carrying an integral stub shaft 67, 68, 69, 70 and 71 extending normal to the brackets and on which the individual inking rollers are freely mounted for rotation when they engage a corresponding printer-ring supported at the level of the particular inking roller.

Means are provided for pivoting all of the brackets 56–60 inclusive about their common pivot pin or shaft 66 thereby to urge the individual inking rollers into engagement with the type 42 of the individual printing rings 36–40 inclusive. Such means conveniently comprise a fixed standard 72, which is mounted adjacent to the brackets 56–60 inclusive on which the inking rollers are mounted, together with a series of tension springs, all designated by the single reference numeral 73, which are anchored at their one ends to arms 74 extending from collars on shafts 72 and anchored at their other ends to the individual brackets 56–60 inclusive. This arrangement of springs 73 effects a constant urging of one end of the brackets 56–60 inclusive about their common pivot pin 66 pin away from the central hub 27 and on which the printing rings are mounted and the bringing of the opposite ends of the brackets carrying the inking rollers 51–55 inclusive into engagement with the type 42 of the individual printing rings.

As particularly illustrated in Figs. 7 and 8 of the annexed drawings, each of the inking rollers 51–55 inclusive includes an inkwell 76, and is formed with a series of passages 77 extending from the top of the roller into engagement with the underlying inkwell so that the well may be filled and emptied readily. Passages 78, which communicate not only with the inkwell 76 but also with the periphery 79 of each inking roller, are provided within each roller, as shown. Preferably, the periphery 79 of each inking roller is fabricated of a spongeous material, such as felt, so that ink constantly supplied thereto from the inkwell 76 is evenly disbursed throughout the entire periphery. Whenever it is desired to provide color printing upon a case or carton contrasting with the conventional printer's ink, the wells of the inking rollers can be supplied with the desired colors of ink and, of course, the inkwells can be constantly changed at the will of the operator so that any desired color of ink can be disposed therein for application to the type 42 of the printing rings and transferred thereby to the end or sides of a case 12, 13, etc., etc., as it is moved along by the conveyor 11 past the case printer 16.

In order that the printing rings may be brought nearer to the side or end of a case or carton being transported along the conveyor 11, I provide means for adjusting the position of endless chain 13 which drives or rotates the printing rings. Such means preferably comprise an intermediate plate 81 which is fitted to the shafts about which chain 33 rotates, see Fig. 3 of the drawings, and which is provided with an elongated slot 82 therein having its walls bearing upon one of such shafts. The plate 81

carries an obliquely disposed arm 82' to which is secured a tension spring 83 which is anchored by means of an adjustable link 84 to the base plate 21. Tensioning of the spring 83, by adjusting link 84, urges the intermediate plate 81 in a direction so as to move the endless chain 33 as well as the printer 16 toward the conveyor 11, while relief of tension on spring 83 by adjustment of link 84 will permit movement of the printer 16 away from the conveyor 11. A lock-nut 86 is mounted on the shaft 26 about which the endless chain 33 rotates so that the intermediate plate 81 may be set in an adjusted position by the tightening of the nut 86 so as to seat upon or bear upon the plate. For minor adjustments of plate 81, I provide a set-screw 87 which pierces a narrow extension 88 of the intermediate plate 81 for bearing upon an abutment or stop 89 secured to the base plate 21 and extending normal thereto. Tightening of set-screw 87 to bear on stop 89 causes a shifting of the printer 16 away from the conveyor belt 11, while loosening of the set-screw 87 causes the movement of the printer 16 toward the belt 11 under the influence of tension spring 83. These adjustments can readily be made whenever the size of the cases or cartons 12, 13, etc., etc., moving along belt 11, vary in size from a given standard.

In order that the printing delineated on each case 12, 13, etc., etc., be in the proper direction for reading, the line of type 42 on the periphery of each of the printing rings 36–40 inclusive is carried backwards or in reverse so that when the printing is rolled upon each of the cartons, by rotation of the printer 16, the transfer of the printing by the type will delineate the letters and numbers in the proper manner.

I have tested my improved case printer upon hundreds of cartons or cases moving along a conveyor belt and have had effective results not only as to saving of time and labor in the printing operation but also with respect to effective legible printing on all cases so printed. The use of contrasting colors in different lines of a printing message on cases or cartons has been eminently effective by simply changing inking rollers, where desired, having the desired colored inks in the wells thereof. Both the printing rings and inking rollers can be rapidly changed, at will, so that different messages or printing indicia for the cases can be readily and speedily set up.

It is to be understood that the appended claim is to be accorded a range of equivalents commensurate in scope with the advance made over the prior art.

I claim:

In apparatus for automatically delineating indicia on each case of a succession of cases carried on a moving conveyer, a base plate, a standard fixedly secured to said base plate in juxtaposition to said moving conveyor, a vertically disposed shaft journaled in said base plate, a main hub of predetermined diameter rotatably mounted on said standard, a first sprocket carried on said shaft, a second sprocket carried on said main hub, an endless chain trained about said first sprocket and said second sprocket to effect rotation of said main hub upon rotation of said shaft, a plurality of printing rings, a central hub on each of said printing rings of slightly greater diameter than the diameter of said main hub for effecting frictional engagement and removable mounting of each of said rings on said main hub and rotation of said rings in unison with the rotation of said main hub, a series of individual type yieldably mounted on and about the periphery of each of said rings; said yieldably mounted individual type on said rings being adapted to yieldably engage an outer surface of each case of a succession of cases on said moving conveyor and to delineate a message of one or more lines thereon, and means for moving said main hub and said endless chain toward and away from said moving conveyor in order to compensate for different sizes of cases carried on said moving conveyor, said means comprising an intermediate plate fitted between said shaft and said standard above said base plate, an arm carried on said intermediate plate, an adjustable link secured to said base plate, and a tension spring anchored to said arm and to said adjustable link; adjustment of said link in one direction effecting the increase of tension of said spring to move said main hub and endless chain toward said conveyor while adjustment of said link in the opposite direction effecting the relief of tension on said spring to move said hub and said endless chain away from said conveyor.

References Cited in the file of this patent

UNITED STATES PATENTS

1,367,066	McDonough	Feb. 1, 1921
1,649,469	Grubman et al.	Nov. 15, 1927
1,845,726	Scott	Feb. 16, 1932
2,085,323	Leash	June 29, 1937
2,172,318	Ferguson	Sept. 5, 1939
2,233,360	Serai	Feb. 25, 1941
2,475,524	Scott et al.	July 5, 1949
2,634,676	McKay	Apr. 14, 1953
2,701,519	McKay	Feb. 8, 1955
2,834,284	Van Buskirk	May 13, 1958