April 14, 1953 J. G. McKAY 2,634,676

DEVICE FOR PRINTING CHARACTERS ON MOVING PACKAGES

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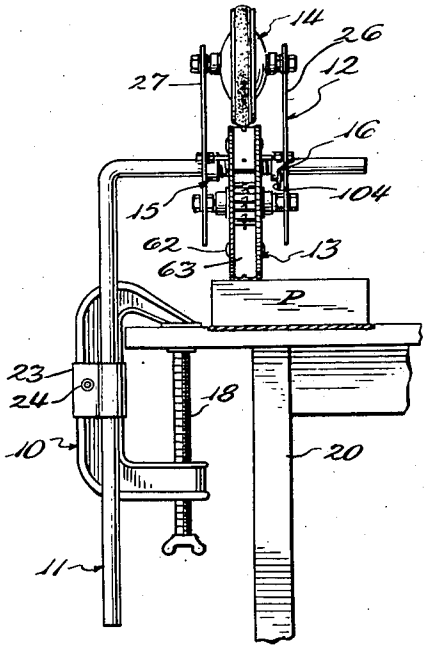


Fig. 1.

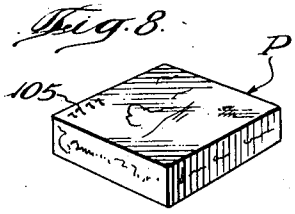


Fig. 8.

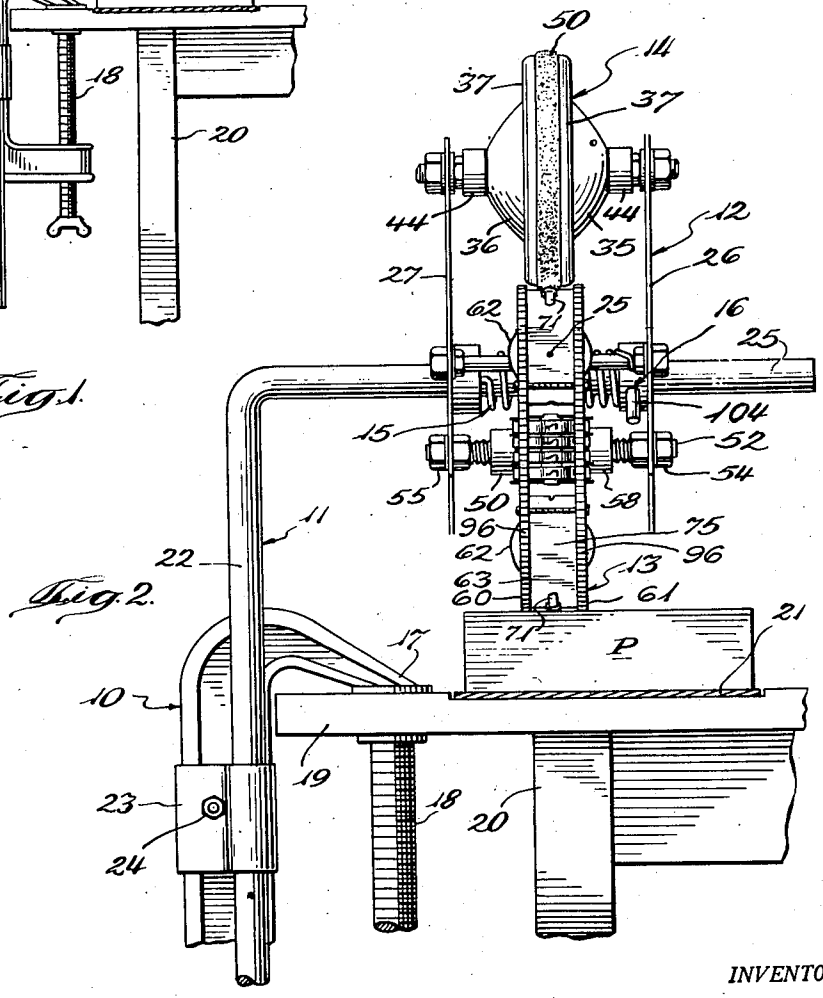


Fig. 2.

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Fig. 3

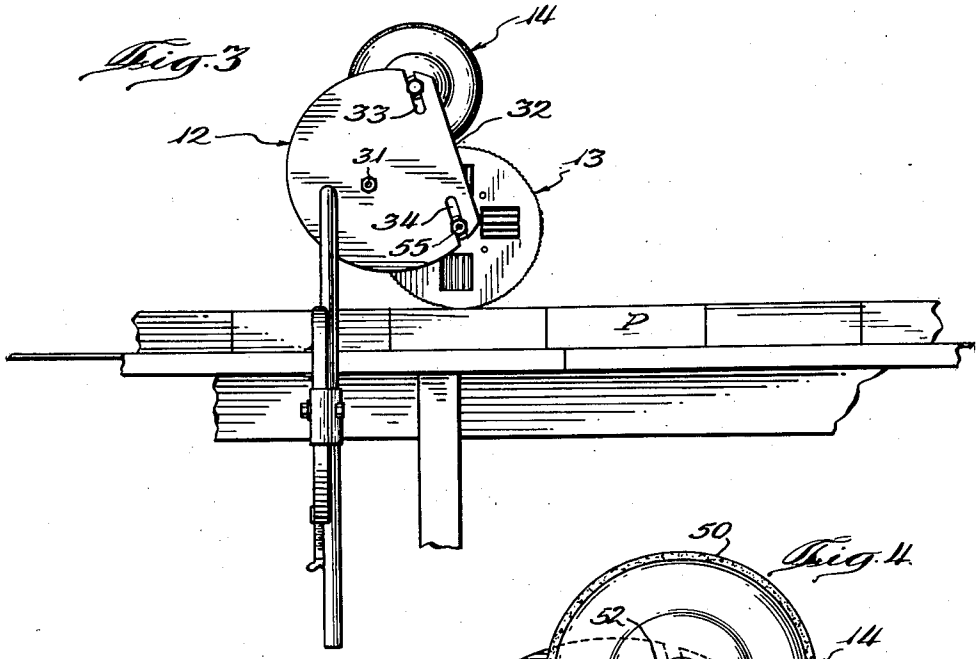


Fig. 4

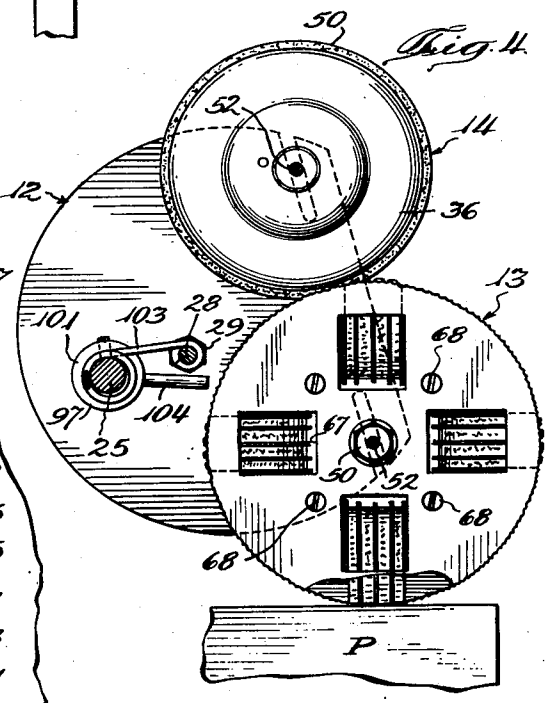
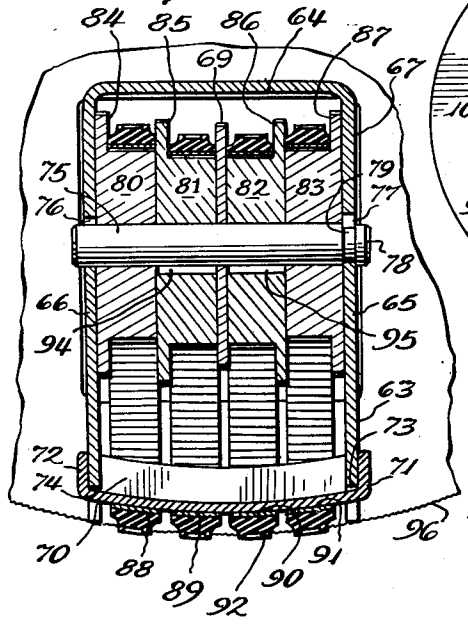


Fig. 7



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DEVICE FOR PRINTING CHARACTERS ON MOVING PACKAGES

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Fig. 6.

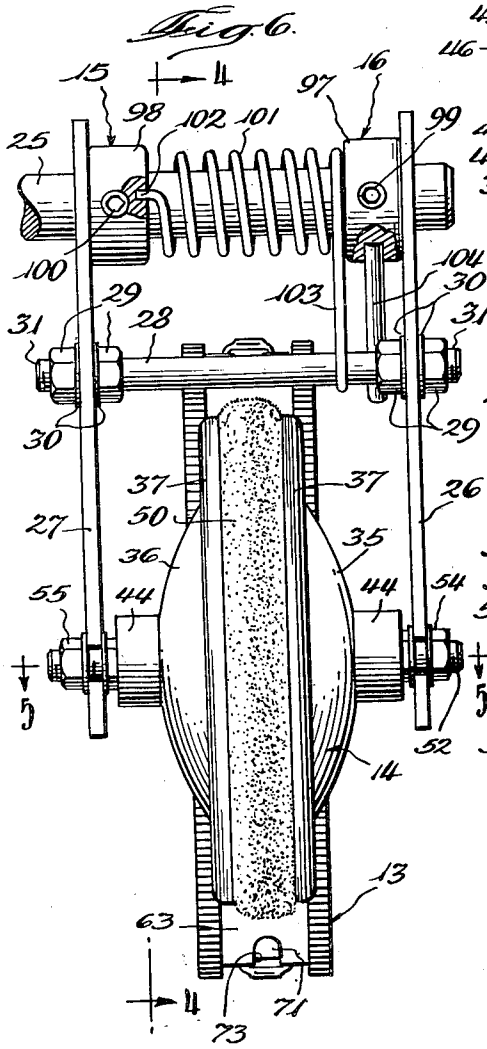
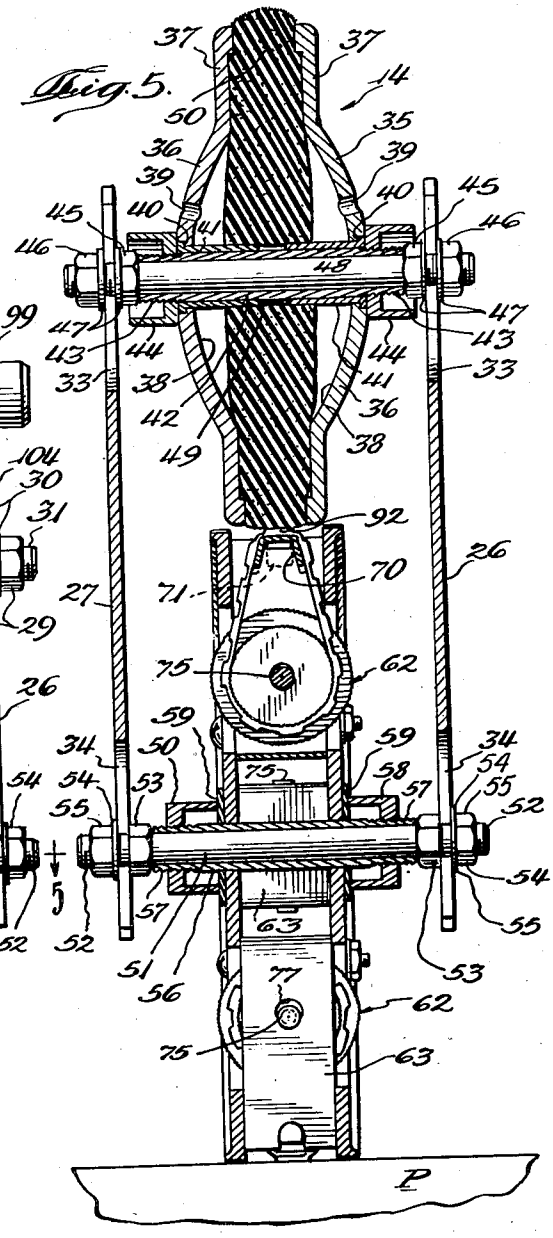


Fig. 5.



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UNITED STATES PATENT OFFICE

2,634,676

DEVICE FOR PRINTING CHARACTERS ON MOVING PACKAGES

James G. McKay, Chicago, Ill.

Original application December 2, 1947, Serial No. 789,239. Divided and this application July 3, 1951, Serial No. 235,016

7 Claims. (Cl. 101—111)

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This invention relates to the construction of a device for automatically applying numbers to a moving line of packages by printing same upon the packages. This application is a division of my co-pending application Serial No. 789,239, filed December 2, 1947, now Patent No. 2,562,627.

In the sale of perishable or semi-perishable products such as cookies, cakes, candies, and the like, it is customary in many cases for the distributor to set a limit to the age of the products sold by the retailer. The stale packages are taken back for credit in most cases. In addition, it is essential that the oldest stock be sold first. It is necessary in all such cases that each package be dated in some manner, but to place the date so that same can be read by the ultimate purchaser is undesirable since the fresh stock will be sold first while the older stock will be sold last, if at all. Dates are therefore placed upon the packages in the form of a code which uses a group of numbers. These numbers are meaningless to the purchaser but clearly identify the freshness of the package upon which they appear to the retailer and the distributor, thereby permitting proper arrangement of stock, etc.

Where the margin of profit is small and large volumes are relied upon to bring the necessary return, the dating of packages becomes a major problem. Handling a package is expensive, and hence a code dater must be such that it can be installed upon a conveyor of packages so that the speed with which the packages are produced by the plant is not impaired. Obviously this can be done with costly equipment and paraphernalia, but the most desirable method would have to be quite cheap. In addition, the code dater must be flexible in use so that it can be used almost anywhere. It is not intended that the code dater be changed from its position at a given plant once installed, but in order to evolve such a device which can be installed upon any assembly line or conveyor, each would have to be custom-made, thereby increasing the price to a large extent.

The primary object of my invention is to solve all of the problems set forth above and to provide a new and improved device which is simple in construction and operation, economical, and highly flexible.

Another object of the invention is to provide a device of the character described which will include a revolving dating wheel carrying all the possible combinations of numbers which can be used and same being adjustable in a simple and expeditious manner.

Still a further object of the invention is to provide a new and improved dating device in which same may be removably attached in a sturdy manner to any conveyor, wrapping machine, carton forming machine, or any other place where cartons, labels, boxes, or cases pass on a conveyor.

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Still a further object of the invention is to provide a dating device of the character described having a printing wheel which has a plurality of adjustable printing units mounted thereon at intervals adjacent the periphery thereof in a novel and improved manner.

Many other objects of the invention lie in the various constructional details of the invention, such as in the manner in which the pressure of the print upon the boxes is controlled; the manner in which the dating wheel and the individual changeable date devices are constructed and arranged; and the manner in which the wheels are mounted and arranged.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangement and a combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of this invention, there is illustrated in the accompanying drawings a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, this invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

Referring to the drawings in which the same characters of reference are employed to indicate corresponding or similar parts throughout the several figures of the drawings:

Fig. 1 is a front elevational view of my printing device showing same attached to a conveyor carrying a line of cartons which are to be imprinted with code dates.

Fig. 2 is a similar view on an enlarged scale.

Fig. 3 is a side elevational view of the printing device shown in Fig. 1.

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 6 in the direction indicated.

Fig. 5 is a sectional view through the entire device taken on a vertical plane along the line 5—5 of Fig. 6 and in the indicated direction.

Fig. 6 is a top plan view of the device.

Fig. 7 is a sectional view taken through one of the individual dating devices to show the construction thereof.

Fig. 8 is a perspective view of a carton showing the manner in which the matter is printed thereon.

At the outset it should be understood that although the device has been described as primarily for use in the code dating of perishable and semi-perishable food stuffs, it is not so limited in

its use. My new device can be used to apply any manner of numbers, printing, symbols, dates, or insignia on any line of moving objects.

Referring now to the drawings, it will be seen that one of the great advantages of my device is that it is capable of being made from standard or easily formed parts. The general elements of the device are the clamp 10, which may be a simple large C-clamp, the bracket 11, the frame 12, the printing wheel 13, the inking wheel 14, the pressure device 15 and the stop device 16. All of these are designated generally and will hereinafter be described in more detail.

The clamp 10 is of the conventional type and includes an anvil 17, and a screw 18. In the illustrations the screw 18 engages the bottom of the platform 19 of the conveyor 20 while the anvil 17 engages the top thereof. The conveyor 20 includes a belt 21 which carries the packages P past the device. The bracket 11 has an upright portion 22 which is attached to the clamp body by a metal strap 23 held in position by the nut and bolt 24. Loosening the nut and bolt 24 permits rotation of the bracket 11 about the axis of the upright 22, or axial movement of said upright. In the preferred embodiment, the bracket 11 is formed from shafting to permit this rotation. There is a portion which actually serves as a shaft at the end of the upright 22 and bent at right angles thereto. This shaft portion of the bracket 11 is designated 25. In installing the device upon the conveyor 20, it is essential that the shaft portion 25 be spaced above the surface that is to be imprinted, and that the axis of the shaft 25 be perpendicular to the line of motion of the packages P. This will be brought out presently.

The frame 12 is rotatably mounted on the shaft portion 25. Said frame 12 consists of two identical plate members 26 and 27 held in spaced relationship by a spacer rod 28, the ends of which are respectively attached to the plate members 26 and 27 by appropriate nuts 29 and washers 30. For this purpose the ends of said spacer may be threaded as shown at 31 and extend through appropriately positioned holes in said plates. Obviously any means of spacing the plates 26 and 27 one from the other will suffice. In the embodiment shown the plates 26 and 27 are formed as substantially circular members having a portion removed along a chord forming the straight edge 32 on each plate member.

Each of the plate members 26 and 27 has open-ended slots 33 and 34 formed therein at opposite sides thereof, spaced from and parallel with the straight edge 32. The upper slots 33 accommodate the inking device 14, while the lower slots 34 accommodate the printing wheel 13. The mountings for these devices are adjustable along the lengths of the slots 33 and 34 so that positions and pressures may be varied within the limit of the extent of said slots.

The printing wheel 13 is mounted in a manner similar to the inking wheel 14. A shaft 51 which acts as a spacer is attached between the plates 26 and 27 with its threaded ends 52 protruding through the slots 34. Nuts 53 are fastened upon the threaded ends 52 inside the plates 26 and 27, while the nuts 54 and washers 55 are fastened outside of said plates. A sleeve 56 having threaded ends 57 is mounted upon the shaft 51 for free rotation thereon. Said sleeve carries the wheel 13 by means of the nuts 58 and washers 59.

The wheel 13 comprises a pair of discs 60 and 61 which carry numberers therebetween. Each of said numberers is constructed identically and

hence the description of any one will include the rest. Said numberers are indicated generally at 62, and are mounted in a manner to be described. Each numberer includes a substantially U-shaped frame 63 as best shown in Fig. 7. Said frame comprises a base portion 64 and right and left leg portions 65 and 66. Each numberer 62 is mounted so that the frame 63 borders three sides of a rectangular opening 67 provided therefor in each of the discs 60 and 61. There are provided as many openings 67 as numberers 62 about the circumference of the discs 60 and 61, said rectangular openings 67 being spaced inwardly of the periphery of the discs 60 and 61, and the U-shaped frames facing radially outwards of said wheel. The frames 63 have their thicknesses extending between the inner faces of the discs 60 and 61, and hence space same apart. The bolts and nuts 68 clamp the frames 63 in position.

Across the free ends of the leg portions 65 and 66 there extends a bridge member 70 of generally channel shaped cross section and having the channel ends abutting against the inside faces of the leg portions 65 and 66 for spacing same apart. The ends of the bridge member 70 are provided with ears 71 and 72 which are adapted to engage within the slots 73 and 74 provided on said leg portions 65 and 66 and be bent over thereupon. The frame member 65 is thereby fixed as to its conformation. A feature which is highly important to this invention is the formation of the bridge member 70 in arcuate form and of a curvature corresponding to that of the discs 60 and 61. The reasons for this shortly will be apparent.

The frame 65 is provided with a group of friction wheels and printing strips, the construction of which is generally well known and used in commercially available numberers of this type. Thus, there is provided a shaft 75 carried in the bearing openings 76 and 77. The end 78 of the shaft which engages the opening 77 is provided with a groove 79 for engaging the edge of the opening 77 to permit disassembly in a manner well known. The shaft 75 carries friction wheels 80, 81, 82, and 83, each having the usual knurled flange 84, 85, 86, and 87 respectively. A spacing washer is shown at 69. Flexible printing tapes or bands 88, 89, 90, and 91 are carried by the respective wheels, each tape being endless and extending around the respective wheel and the bridge 70. The tapes all carry rubber printing numbers or letters in the usual manner as indicated at 92. The diameter of the knurled flanges 84 to 87 is greater than the width of the frame 65 and hence the wheel flanges extend outside of the openings 67 so that same may be manipulated from outside of the wheel 13 for changing the face of the characters 92 positioned upon the bridge 70 in the well known manner of operating such numberers.

As stated above, the general construction of the numberers 62 is well known, but attention is now directed to a constructional detail thereof which is one of the features of the invention. The wheels 80 to 83 are mounted upon the shaft 75 for free rotation thereof when the knurled flanges 84 to 87 are moved. The distance from the shaft to the bridge 70 is substantially different at the ends of the shaft than at the center of the shaft by reason of the curvature of the bridge 70. In order that the tapes 88 to 91 all be under substantially uniform tension, it is necessary to compensate for this variation of distance. The preferred expedient, and one which is highly economical is to provide the wheels 81 and 82 with

bearings larger than those of wheels 80 and 83. Such bearings are openings 94 and 95 and they permit the wheels 81 and 82 to be rotated as desired in the same manner as wheels 80 and 83, while the tapes 89 and 90 move eccentrically of the movement of tapes 88 and 91, thereby compensating for the differences in distance above referred to.

By my construction, the necessity of providing special wheels, shafts or tapes is eliminated without loss of operating efficiency.

Having described the printing wheel 13, the manner of operation thereof should be pointed out. The characters 92 are adjusted to protrude from the edge of the wheel 13 a slight amount. Said edges are milled as shown at 96 in order that same will frictionally engage and be moved by the moving line of packages P. Thus the pressure to which said characters P are subjected can be adjusted for optimum conditions of printing and wear. The wheel 14 is adjusted so that the free edge thereof is engaged by the characters 92 as same rotate past. Movement of the wheels 13 and 14 relative to one another is obtained by adjustment of the respective positions of said wheels in the slots 33 and 34.

The position of the frame 12 along the shaft 25 is adjusted by means of a pair of collars 97 and 98 respectively bearing against the inner faces of the plate members 26 and 27. The collar 98 is a part of the pressure device 15 and the collar 97 is a part of the stop device 16. Each collar is capable of being fixed to the shaft 25 by the set screws 99 and 100. A spring 101 is coiled about the shaft 25 and has one end 102 thereof attached to the collar 98, and the opposite end 103 extending perpendicularly from the shaft 25 to slightly beyond the spacer rod 28 whereby said rod is engaged thereby. The spring 101 therefore serves to urge the frame 12 downwardly, or clockwise as viewed in Fig. 3, about the shaft 25, with the pressure controlled by the amount with which the collar 98 has been rotated about the shaft 25 prior to affixing same thereon. If desired additional openings (not shown) to accommodate the end 102 may be provided about the face of collar 98.

The downward movement above described is limited by a stop member 104 which is attached to the collar 97, and the free end of which extends beneath the spacer rod 28.

The manner of operation of the device is generally as follows: The characters 92 are adjusted in each of the numberers by manipulation of the appropriate wheels 80 to 83, and the stop member 104 is adjusted so that the distance which the periphery of the wheel 13 is spaced above the conveyor belt is slightly less than the thickness of the packages P. The tension of the spring 101 is adjusted so that the packages will engage beneath the wheel 13 and lift same together with the frame 12, rotating said frame a slight amount about the shaft 25 without injuring the covering of said package. As the package P moves past the wheel 13, the milled edges engage the surface of the package causing the characters to be impressed against said package. While the wheel is rotating, ink from the inking wheel 14 is being applied to the characters of the numberer 82 opposite to the one engaging the package.

The position of the impression relative to the package P can be adjusted by changing the position of the frame 12 along the shaft 25. In Fig. 8 the impression 106 is shown placed along an edge of the package P.

It is believed that my invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing without further description, and it should also be manifest that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are nevertheless capable of wide variation within the purview of my invention as defined in the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

1. In a device of the character described, a printing wheel comprising a pair of discs having adjustable numberers positioned therebetween and circumferentially thereof with the printing edges of said numberers having their printing edges lying substantially upon the edge of said wheel and protruding slightly therebeyond whereby to print characters upon a surface against which said wheel is rolled, each numberer including a frame having a plurality of friction wheels and a bridge member at opposite edges thereof and having continuous bands of printing characters extending over respective wheels and the bridge whereby by rotating the wheels a line of different characters may be positioned upon said bridge member, said bridge being curved to enable the line of characters substantially to follow the curvature of said wheel, and said friction wheels having means whereby certain of the bands may be revolved eccentrically with respect to the other to compensate for the curvature of said bridge.

2. In a device of the character described, a printing wheel comprising a pair of discs having adjustable numberers positioned therebetween and circumferentially thereof with the printing edges of said numberers having their printing edges lying substantially upon the edge of said wheel and protruding slightly therebeyond whereby to print characters upon a surface against which said wheel is rolled, each numberer including a frame having a plurality of friction wheels and a bridge member at opposite edges thereof and having continuous bands of printing characters extending over respective wheels and the bridge whereby by rotating the wheels a line of different characters may be positioned upon said bridge member, said bridge being curved to enable the line of characters substantially to follow the curvature of said wheel, and said friction wheels having means whereby certain of the bands may be revolved eccentrically with respect to the other to compensate for the curvature of said bridge, the friction wheels of each numberer being mounted on a single shaft and said means comprising providing larger bearing openings in the center wheels of said numberers.

3. In a device of the character described, a printing wheel comprising a pair of discs having adjustable numberers positioned therebetween and circumferentially thereof with the printing edges of said numberers having their printing edges lying substantially upon the edge of said wheel and protruding slightly therebeyond whereby to print characters upon a surface against which said wheel is rolled, each numberer including a frame having a plurality of friction wheels and a bridge member at opposite edges thereof and having continuous bands of printing characters extending over respective wheels and the bridge whereby by rotating the wheels a line of different characters may be positioned upon said bridge member, said bridge being

curved to enable the line of characters substantially to follow the curvature of said wheel, and said numberers having means whereby certain of the bands may be revolved eccentrically with respect to the other to compensate for the curvature of said bridge.

4. In a device of the character described, a printing wheel comprising a pair of discs having adjustable numberers positioned therebetween and circumferentially thereof with the printing edges of said numberers having their printing edges lying substantially upon the edge of said wheel and protruding slightly therebeyond whereby to print characters upon a surface against which said wheel is rolled, each numberer including a frame having a plurality of friction wheels and a bridge member at opposite edges thereof and having continuous bands of printing characters extending over respective wheels and the bridge whereby by rotating the wheels a line of different characters may be positioned upon said bridge member, said bridge being curved to enable the line of characters substantially to follow the curvature of said printing wheel, and said friction wheels of each frame being independently rotatably mounted on the respective frame with the axes of rotation of the friction wheels arranged along a curved line substantially parallel with the bridge of the associated frame to compensate for the curvature of the said bridge.

5. In a device of the character described, a printing wheel comprising a pair of discs having adjustable numberers positioned therebetween and circumferentially thereof with the printing edges of said numberers having their printing edges lying substantially upon the edge of said wheel and protruding slightly therebeyond whereby to print characters upon a surface against which said wheel is rolled, each numberer including a frame having a plurality of friction wheels and a bridge member at opposite edges thereof and having continuous bands of printing characters extending over respective wheels and the bridge whereby by rotating the wheels a line of different characters may be positioned upon said bridge member, said bridge being curved to enable the line of characters substantially to follow the curvature of said printing wheel, and said friction wheels of each frame being independently rotatably mounted on the respective frame with the axes of rotation of the friction wheels arranged along a curved line substantially parallel with the bridge of the associated frame to compensate for the curvature of the said bridge, there being a single shaft extending between sides of each frame and having all of the friction wheels of that frame journalled thereon.

6. In a device of the character described, a printing wheel comprising a pair of discs adapted to be mounted for free rotation, each disc having a plurality of rectangular openings spaced inwardly from the periphery of the discs, said openings being opposed when the discs are mounted, an adjustable numberer positioned between each pair of opposed openings between said discs and circumferentially thereof with the printing edges of said numberers having their printing edges lying substantially upon the edge of said wheel and protruding slightly therebeyond whereby to print characters upon a surface against which said wheel is rolled, each numberer including a frame having a plurality of friction wheels and a bridge member at opposite edges thereof and having continuous bands of printing characters extending over respective wheels and the bridge, said friction wheels each having an annular flange having a diameter greater than the thickness of said frame extending through the pair of openings with which it is aligned and outside thereof whereby said flanges may be manipulated from outside of the discs to rotate the friction wheels for positioning a line of different characters upon the bridge member, said frame having a base and a pair of upstanding, spaced apart leg portions, said friction wheels being rotatably mounted between said legs with the bridge member opposite the base, said numberer being mounted between said discs with said frame bordering three sides of the opposed openings with which it is aligned, said frame serving to space said discs one from the other, said bridge being curved to enable a line of characters substantially to follow the curvature of the said discs, each numberer having means whereby certain of the bands may be revolved eccentrically with respect to the other to compensate for the curvature of the bridge.

7. In a device of the character described, a printing wheel comprising a pair of discs adapted to be mounted for free rotation, each disc having a plurality of rectangular openings spaced inwardly from the periphery of the discs, said openings being opposed when the discs are mounted, an adjustable numberer positioned between each pair of opposed openings between said discs and circumferentially thereof with the printing edges of said numberers having their printing edges lying substantially upon the edge of said wheel and protruding slightly therebeyond whereby to print characters upon a surface against which said wheel is rolled, each numberer including a frame having a plurality of friction wheels and a bridge member at opposite edges thereof and having continuous bands of printing characters extending over respective wheels and the bridge, said friction wheels each having an annular flange having a diameter greater than the thickness of said frame extending through the pair of openings with which it is aligned and outside thereof whereby said flanges may be manipulated from outside of the discs to rotate the friction wheels for positioning a line of different characters upon the bridge member, said frame comprising a U-shaped member having a pair of spaced leg portions, said friction wheels being rotatably mounted between said legs, said bridge being curved to enable a line of characters substantially to follow the curvature of the said discs, at least one of said wheels being eccentrically mounted with respect to the others whereby its band may be revolved eccentrically with respect to the others to compensate for the curvature of the bridge.

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