

[54] DATA INDICATING DEVICE FOR
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[58] Field of Search 101/45, 269-274,
101/110, 111, 95

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[57] ABSTRACT

The disclosure relates to a data indicating device for printing machines wherein a plurality of rotatable type wheels adjacently aligned, and respectively inscribed with printing numerals on the peripheries thereof are each furnished with a gear at one side thereof, and the same number of rack bars are arranged each to engage the gear of the type wheel, and manual operating end portions of the rack bars project out of the machine housing in spaced relation. To these operating portions are connected flexible data indicating bands bearing on one face thereof numerals corresponding to the printing numerals on the peripheries of the type wheels, and these bands are guided on a concave curved inner surface to windows formed in the machine housing, thereby to indicate at the windows the selected printing numerals corresponding to those on the type wheels which are rotated by manipulation of the operating and portions of the rack bars.

8 Claims, 6 Drawing Figures

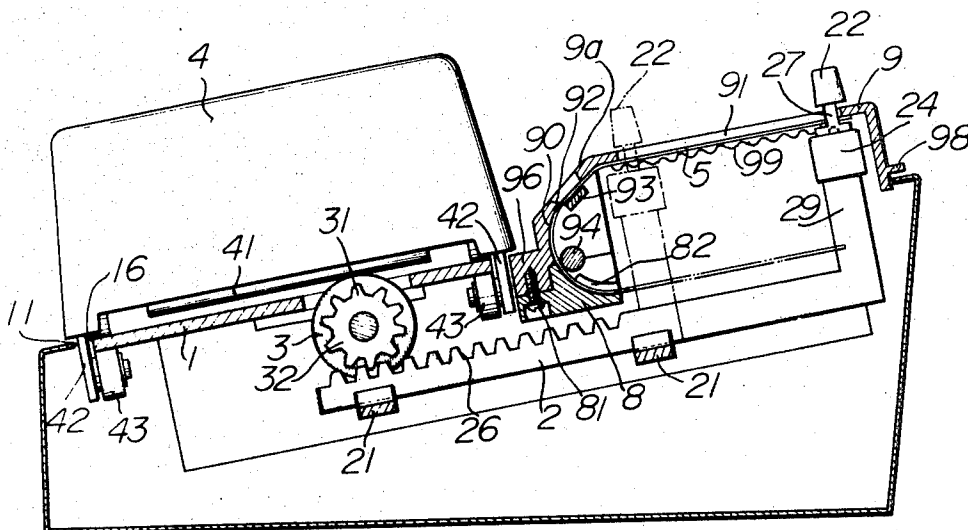


FIG. 1

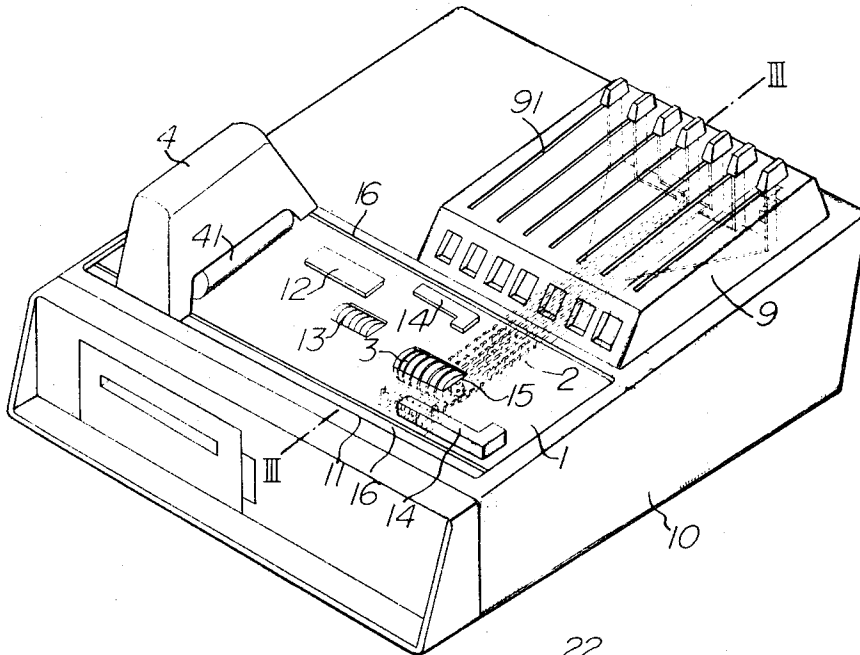


FIG. 2

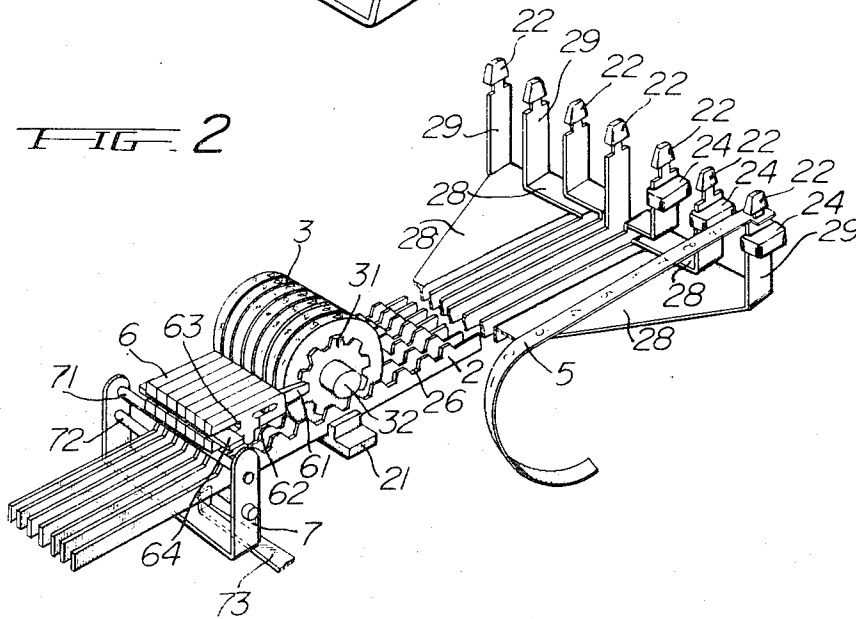


FIG. 3

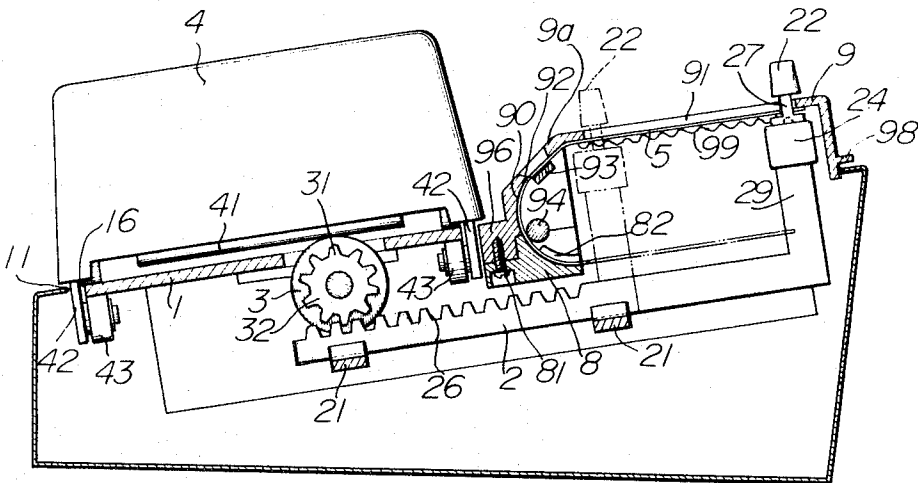


FIG. 5

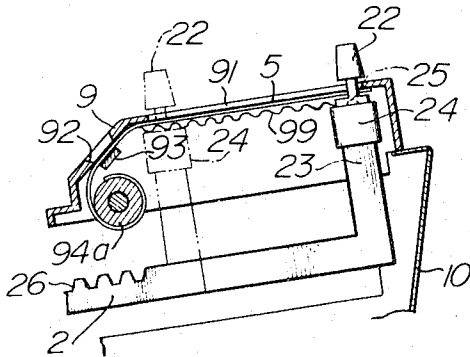


FIG. 6

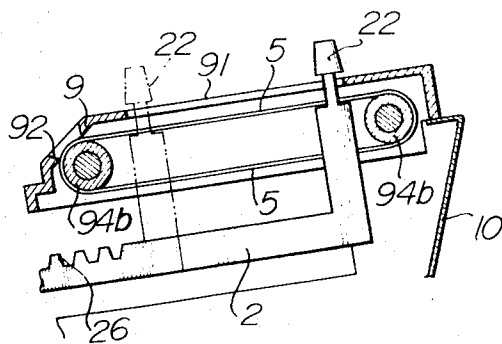
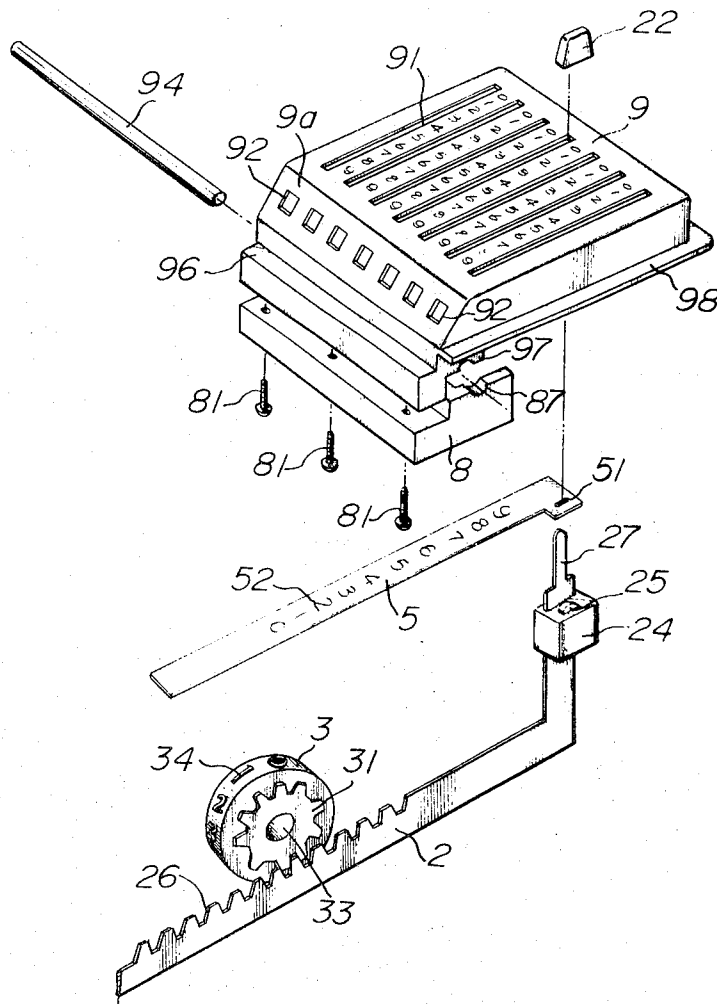


FIG. 4



DATA INDICATING DEVICE FOR PRINTING MACHINES

BACKGROUND OF THE INVENTION

The invention relates to a data indicating device for printing machines for visually indicating the numerals for printing.

As well known, registration has to be effected on slips or sales records in various sales transactions, and such registration has been made by the penmanship of dealers. Recently in order to avoid many troubles and inconveniences accompanied by such a manner of registration, simplified printing machines are employed by dealers. However, these printing machines still remain to be improved. According to the conventional printing machines, the selection of numerals is not always well effected since the operator has to watch the selected numerals while he is selecting these numerals to be printed. Besides the dealers who treat such printing machines are usually not well accustomed to the printing types, and it is not easy for them to read the type numerals while they are manually turning the type wheels, since the printing types are small and made of a metallic substance.

The invention has been devised to eliminate the shortcomings and disadvantages of the prior arts. The fundamental object of the present invention is to provide a device in which the printing numerals are indicated in a series of windows on the machine housing by means of flexible data indicating bands, instead of watching the printing types as in the prior art. Due to the indication by means of the flexible numeral indicating bands, it is possible to avoid trouble in reading the printing types. According to the invention, even those who are not accustomed to printing machines may easily handle the printing machine and confirm the selected numerals as they are indicated.

Another object of the invention is to provide on the band enlarged printing numerals for indication. As above stated, the printing types on the type wheels are comparatively small and it is not easy to read them for confirmation. According to the invention, enlarged selected numerals are indicated in the windows in the machine housing by means of the flexible data indicating bands. For this purpose, the manually operated end portions of rack bars are arranged parallel spaced from each other to rotate a series of type wheels, and to the operating end portions of rack bars are respectively connected the data or numeral indicating bands so that these bands may be moved to the respective windows by manipulation of the end portions of rack bars, thereby to indicate at the windows the enlarged numerals on the bands which correspond to the printing types on the type wheels.

Another object of the present invention is to provide a data indicating device for printing machines which may be accommodated in a small machine housing and easily operated. For this purpose, the data or numeral indicating bands are made of a flexible material so that it may be suitably guided along a concave curved inner face inside of the machine housing. Since the bands at the curved face within the machine housing are pressed against the windows at the inside thereof, indication of the numerals will be obtained. Because the indicating bands are flexible, they can be appropriately arranged within the comparatively small space in the printing

machines which are generally for use in shops and department stores.

Many other features and advantages of the invention will be apparent from the following description of the preferable embodiments in reference to the attached drawing, in which:

FIG. 1 is a perspective view of a printing machine embodying the data indicating device of the present invention.

FIG. 2 is a fragmentary perspective view of the data indicating device of the present invention.

FIG. 3 is a cross section taken along line III — III of the printing machine shown in FIG. 1.

FIG. 4 is an exploded perspective view of the data indicating device of the present invention.

FIG. 5 is a cross section showing another embodiment of data indicating device according to the present invention.

FIG. 6 is a cross section showing still another embodiment of data indicating device according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In reference to FIGS. 1 — 3, a printing bed 1 is mounted on a machine housing 10 in the opening 11 on the front part. The top surface of the housing is downwardly sloping from the rear part to the front part, and accordingly the printing bed 1 is sloping on the housing. A panel 9 is provided on the housing rearwardly of the printing bed. On the printing bed 1 there are provided a printing plate 12, date printing wheels 13, positioning pieces 14 for positioning a copy sheet on the printing bed, and an opening 15 through which a plurality of type wheels 3 bearing printing types forming numerals are partly exposed. On both sides of the printing bed 1 slots 16 between the printing bed and the opening 11 on the top surface of the housing are left free. Into the slots 16 dependent pieces 42 on both sides of a carriage 4 are inserted, and the carriage 4 is movably held on the printing bed by means of rollers 43 attached to the depending pieces 42 and engaging both marginal side surfaces of the printing bed 1. A platen roller 41 is rotatably supported on the carriage 4, so that it effects printing on the copy sheets such as sales slips placed on a predetermined place on the printing bed 1, from the printing plate 12, the date printing wheels 13, and the type wheels 3 on which the copy sheet is placed, before the carriage is moved transversely of the printing bed 1.

For manually rotating the type wheels 3 to select any of the types forming numerals on the peripheries thereof for printing, gears 31 are provided. These gears are fixedly attached to one side of the respective type wheels 3, and rotatably arranged on a shaft 32 coaxial with the type wheels 3. The gears 31 are respectively engaged by rack bars 2 which have racks 26 formed thereon. The rack bars 2 are as shown in FIG. 2 parallel and in a spaced relation to each other, and slidably guided on fixed comb shaped guide 21 which is located under the rack bars 2. The rack bars are, except the central one, bent at the end horizontally as designated by reference numeral 28, and then bent upwardly to form vertical portions 29. Thus the portions 29 of the rack bars 2 are arranged properly and equally spaced from each other a greater distance than rack portions 2, 26. The panel 9 is formed with parallel slots 91 ex-

tending in equally spaced from each other, and from these slots the upper neck portions 27 of the vertical portions 29 of the rack bars 2 project outside of the panel 9 as shown in FIGS. 3 and 4. Knobs 22 are attached to the upper ends of the rack bars 2, 29. Just below the neck portions 27, projections 24 are provided on portions 29 of the rack bars 2, which are provided with catch engaging elements 25 formed on the upper faces thereof as shown especially in FIGS. 4 and 5. The engaging catch elements 25 are respectively adapted to engage serrated plates 99 which are each provided inside of the panel 9 along the slots 91.

The rack bars 2 are selectively moved by the operator holding the manually operated knobs 22 in the longitudinal direction of the slots 91, that is, from the position at which the vertical portion 29 of the rack bar 2 is illustrated in a solid line to the position at which the portion 29 is illustrated in an imaginary line as shown in FIGS. 3, 5 and 6. The rack bars 2 are detained in any desirable position within the slots 91 of the panel 9 by engagement between any one of the recesses of the serrated plate 99 with the engaging elements 25 on the projections 24. Thus the type wheels 3 are rotated by longitudinal movement of the rack bars 2 to bring selected numerals on the type wheels to the printing positions.

As particularly shown in FIGS. 2 and 4, flexible numeral or data indicating bands 5 are at one end thereof connected to the neck portions 27 of the rack bars 2 by means of a slot 51 formed in one end of each band 5 through which each neck portion 27 is inserted. The bands 5 are each provided on one face thereof with indicating numerals 52 corresponding to the numerals 34 of the types on the periphery of the type wheels 3. For guiding the indicating bands 5, the panel 9 is at its forward end portion an inclined wall portion 9a and further has a projecting portion 96. To the underside of the portion 96 of the panel 9, a block 8 is attached by means of fastening screws 81. The slanted wall portion 9a and the portion 96 of the panel 9 and the block 8 provide at their inner surfaces a continuous curved concave inner guide faces 90 as shown in FIG. 3. A portion of the flexible indicating band 5 having a row of indicia numerals slidingly abuts the curved faces 90. The inclined portion 9a of the panel 9 is formed with a series of windows transversely of the panel 9 under which each indicia numeral on the numeral indicating bands 5 can be placed so that it may be observed from outside of the printing machine, since the bands 5 are guided along the paths in which the windows are located. Inside of the inclined portion 9a of the panel 9, an elongated holding plate 93 is provided transversely of the panel 9 and closely opposite to the series of windows 92 forming a gap to hold a portion of the numeral indicating bands 5 against the respective windows. Another holding rod 94 is provided in parallel with the holding plate 93 just below the same and closely opposite the curved faces 90 of the panel 9 to hold part of each band 5 against the curved faces 90. The holding rod 94 is, as shown in FIG. 4, arranged in a recess 97 on the portion 96 of the panel 9 and in a confronting recess 87 on the block 8. Further a guiding plate 82 parallel with the holding rod 94 is located just below the same and closely opposite the curved faces 90 to hold a portion of each numeral indicating band 5 in a gap against the lower curved face 90 as shown in FIG. 3. Thus the numeral indicating bands 5 are guided in the correct di-

rection. The panel 9 is supported on the machine housing 10 with the flange 98 around the panel being overlaid on the edge around the opening 11 in which the panel 10 is fitted as shown in FIG. 3.

For accurately angularly positioning the type wheels 3 which are respectively rotated by the rack bars 2 through the gears 31, detent elements 6 are arranged perpendicular to the rotation axis of the gears 31 as shown in FIG. 2. The detent elements 6 are spring biased toward the rotation axis of the gears 31 so that the protruded ends 61 of the detent elements may engage respective recesses of the gears at all times. The detent elements 6 can be guided in the longitudinal direction by a guide bar 64 which engages aligned recesses 63 formed on the rear ends of the detent elements 6, and can be resiliently displaced for a distance limited by a rod in slots 62 respectively formed on the detent elements 6, when the type wheels 3 and gears 31 are rotated for data selection. A U-shaped frame 7 is provided for holding the detent elements 6 and the type wheels 3 fixed in the respective selected positions. The frame 7 is turned around a cross shaft 72 in response to transverse printing movement of the carriage 4 on the printing bed 1 thereby to hold with its cross bar 71 the rear portions of the detent elements 6 to prevent the same from moving in the longitudinal direction during the printing operation. Accordingly the type wheels 3 are fixedly held by the respective detent elements 6 and prevented from being angularly displaced during the printing operation. The turning movement of the U-shaped frame 7 is effected by the carriage 4 moving transversely across the printing bed 1.

FIG. 5 shows another embodiment of the present invention, in which a roller 94a is provided for each indicating band 5. The roller is arranged in the forward part of the panel 9 and has a power spring mounted therein, so that it may wind up and let off the indicating band 5 depending upon operation of the corresponding rack bar 2, since the end of the band 5 is fixedly connected to the roller (94a).

FIG. 6 shows still another embodiment according to the present invention, in which a pair of rollers 94b is provided within the panel for each data indicating band 5 which is made endless. The two rollers 94b are oppositely arranged in the rear and front parts respectively of the panel 9 and carry the data indicating band 5 so that the band can be transferred in the manner as a belt conveyor as the corresponding rack bar 2 is operated.

In either construction, it is apparent that the type wheels 3 are rotated by the gears 31 by moving the respective rack bars 2 while the or data indicating bands 5 are correspondingly moved to indicate the selected numerals at the windows of the panel 9 representing the corresponding printing type numerals on the type wheels 3. According to the embodiments of the present invention, it is no more necessary to take trouble in checking the printing type numerals. The selected data or numerals on the type wheels are easily confirmed in reference to the data or numeral indicating bands, the numerals on which are selectively indicated at the windows of the panel on the printing machine. Therefore, the numerals to be printed are selected rapidly and easily. Structure is comparatively simple, compact and convenient for mass production, bringing about industrial advantages.

We claim:

1. Data indicating device for printing machines comprising housing means; at least one type means having angularly spaced types and mounted on said housing means for turning movement; operating means including manual means and being mounted on said housing means for movement, said operating means being connected with said type means for turning the same stepwise between a plurality of angular positions in which different types are in a printing position; a control panel on said housing means having a wall portion with a curved concave inner guide face and at least one window opening on said inner guide face; holding means supported on said panel located inward of said curved concave inner guide face and having at least one guide face confronting said curved concave inner guide face and forming at least one gap with the same; and at least one flexible data indicating band having a portion with a row of indicia spaced corresponding to said types, said band having one end secured to said manual means, and a free end threaded through said gap, said band having a thickness corresponding to the width of said gap so that the outer face of said portion of said band is slidably guided on said curved concave inner guide face, whereby due to simultaneous turning of said type means and movement of said band by said manual means that index is always located directly under said window which corresponds to that type which is in said printing position.

2. Data indicating device as claimed in claim 1 including a guide block secured to said wall portion and having a curved concave inner guide face forming a continuation of said curved concave inner guide face of said wall portion and wherein said curved concave inner guide face of said wall portion and said curved

concave inner guide face of said block together extend over substantially 180° for guiding the free end of said band back toward said manual means.

3. Data indicating device as claimed in claim 1 wherein said holding means include a plurality of angularly spaced holding members forming a plurality of angularly spaced gaps along said curved concave inner guide face for guiding said band along angularly spaced portions of said curved concave guide face.

4. Data indicating device as claimed in claim 3 wherein one of said holding members includes a holding bar mounted in confronting recesses of said panel and said block.

5. Data indicating device as claimed in claim 1, wherein said wall portion is slanted for observation of said indicia through said window.

6. Data indicating device as claimed in claim 1, wherein said operating means include a gear secured to said type wheel, and a rack bar meshing with said gear and having a manually operated part constituting said manual means.

7. Data indicating device as claimed in claim 6, wherein said part includes horizontal and vertical portions, said manually operated vertical portion having a manually operated end portion and being aligned with said window; and wherein said one end of said band is secured to said end portion of said vertical portion.

8. Data indicating device as claimed in claim 1, comprising a spring biased roller mounted in said panel and to which said free end of said band is secured so that said band is rolled up on said roller by a spring force when said band is pushed by said manual means along said curved guide face.

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