

[54] **DATING DEVICE FOR PRINTERS**

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[58] **Field of Search** 101/110, 95, 99, 90, 45

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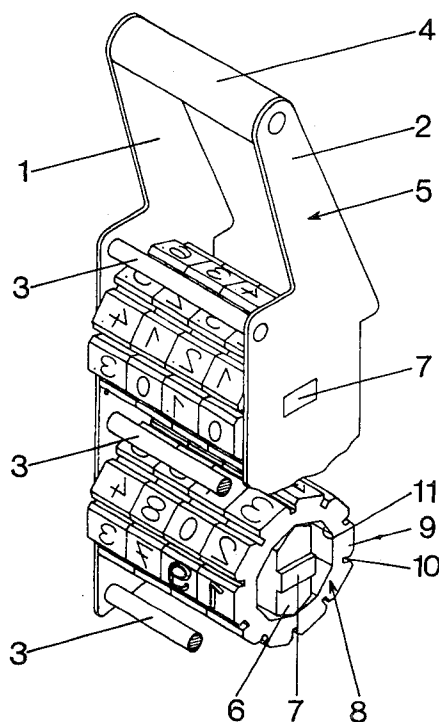
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[57]

ABSTRACT

A printer including a printing plate, a dating device having a detachable unit which is detachably connected to the printing plate, and a movable hammer for applying a force to the dating device. The dating device has an axle of polygonal cross-section, type wheels including a rim of elastically deformable material with a polygonal inner-section movably mounted on the axle and connected to the printing plate to be movable in the direction of movement of the hammer, and types on the type wheels. The types on the type wheels opposite those types which are in the printing position are located at a distance from the printing plate.

2 Claims, 2 Drawing Figures



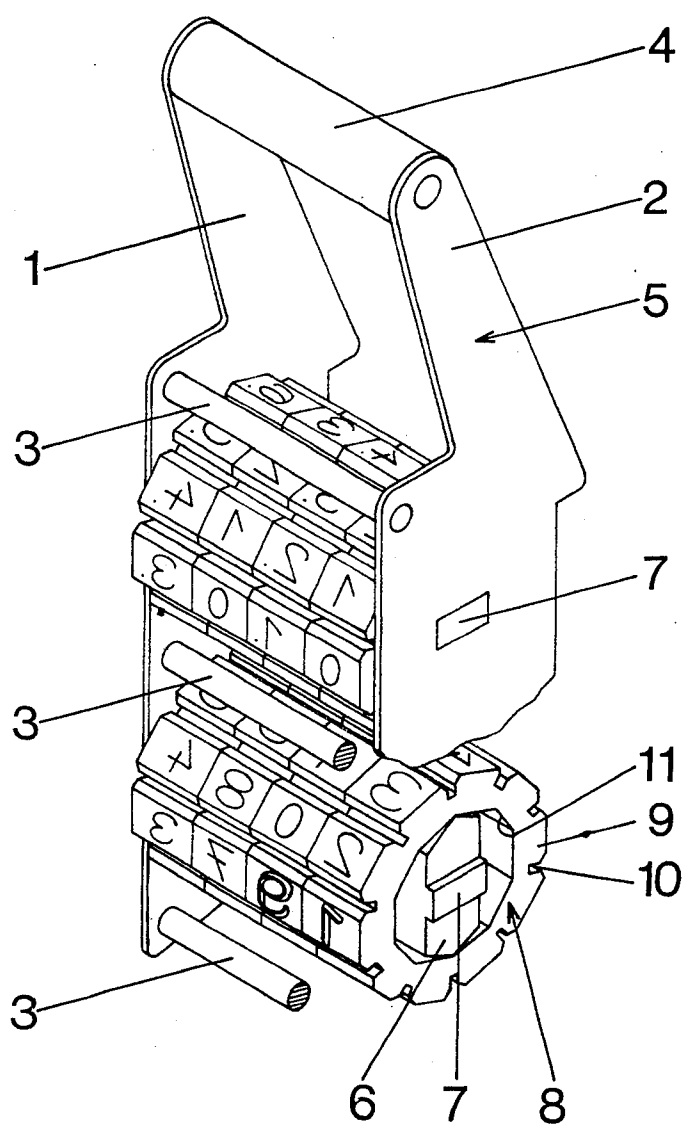


FIG. 1

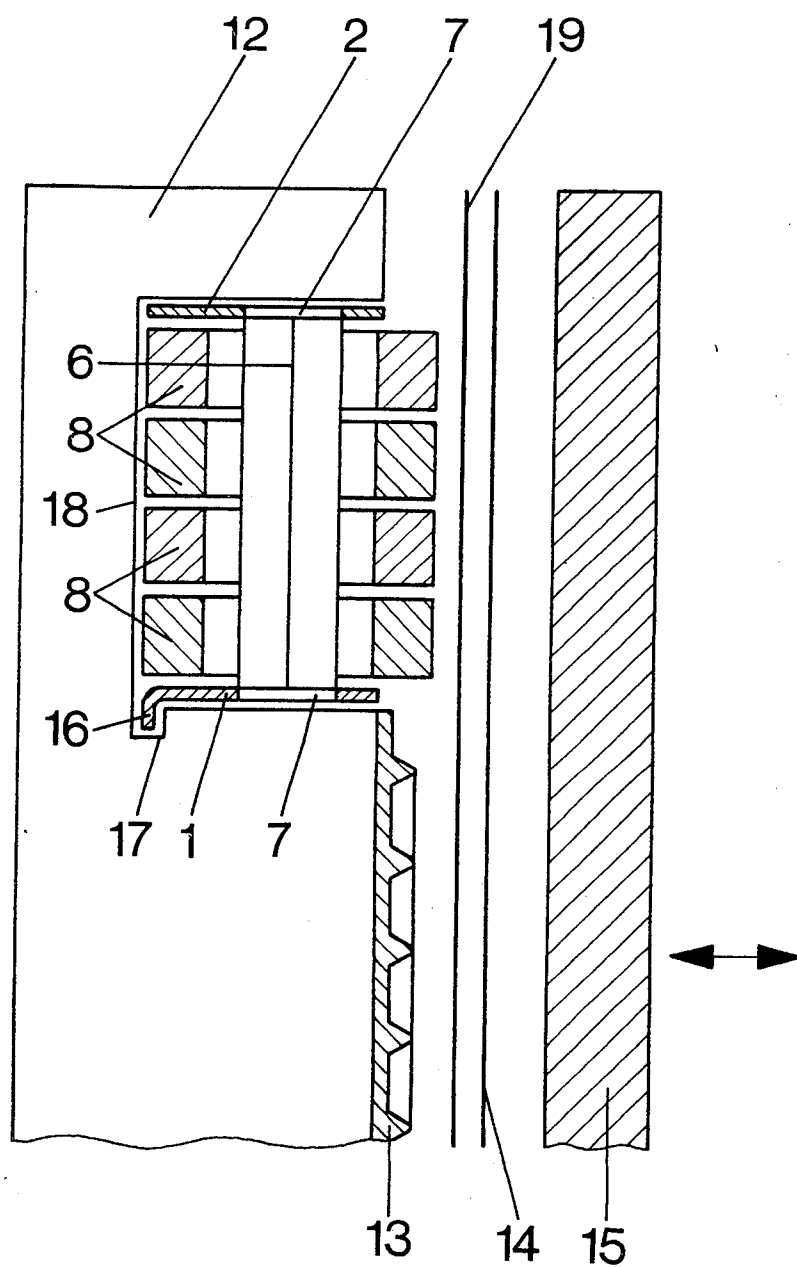


FIG. 2

DATING DEVICE FOR PRINTERS

The present invention relates to a dating device for a printer with a printing plate and a printing hammer, e.g., for cash-registers, scales with tag printers for retail or packaging chains, as well as for other apparatuses with similar printing tasks, in which, besides an optional text like company or product name, at every printing process various data like price and/or weight, or occasionally changing data like actual date of sale and/or last allowed date of sale, have to be printed.

In printers incorporated, for example, in commercial cash-registers or packaging machines, the date of sale or the last allowed date of sale of a product is generally adjusted by means of type wheels rotating on one or several axles fixed in the apparatus. The date is adjusted on or in the apparatus itself, either by directly adjusting the type wheels by means of a suitable instrument or by turning adjusting disks connected with the type wheels for example by means of concentric tubular shafts.

The forces exercised by the printing hammer on the type wheels during the printing process have to be absorbed by the axle or the axles of the type wheels. In order to obtain a clear printed image, tolerances and resistance to plastic deformation must be very tight.

If the type wheels are connected with the external adjusting disks by means of tubular shafts, the number of type wheels thus being operated is limited by the strength of the material employed for the tubular shafts. Furthermore, the choice of the position or the location of the date on the printed tag is limited by the other mechanical characteristics of the printer, because generally such a construction with tubular shafts is chosen in order to have free access to the adjustment disk. If the construction, because of the mechanical design of the apparatus or the small dimensions of the digits to be printed, does not provide tubular shafts, the adjustment of the date has to be made directly with a suitable instrument. This implies free access to the type wheels, which fact influences the construction of the printer itself. Furthermore this type of adjustment of the date is bound to a certain minimum size of the characters, which permits good readability at normal working distance from the apparatus. The fixed mounting of the dating device in the printer causes the absorption of all the forces exercised on the types during the printing process by the axles or the shafts of the type wheels, which are connected firmly to the frame. This, together with the small tolerances of the constructive parts of the dating device demanded to obtain a clear printed image, requires considerable constructive and economic expense for a dating device.

It is the object of the present invention to create a simply constructed dating device for a printer of the kind mentioned above, which is adjusted externally and independently from the apparatus itself, thus to simplify not only the construction of the dating device, but also the construction of the printer, and besides, to be able to print the date or the dates on the tag in a convenient position, which is independent from the printer's construction; a further object of the invention is to be able to build the constructive parts of the printer with larger tolerances than those usually used for printing devices, thus to reduce not only the constructive, but also the economic expense.

According to the invention this is achieved by designing the dating device as a detachable unit. This unit is

preferably provided with type wheels movably assembled in the direction of motion of the printing hammer. According to a further development of the invention the dating device is provided with at least one fixed polygonal axle on which elastically deformable type wheels with a polygonal inner section are assembled, the characters opposite to those adjusted for printing being at a distance from the printing plate and touching it only during the printing process. Furthermore, it can be provided with two parallel polygonal axles disposed one upon the other, each one carrying a series of type wheels. If the dating device is used on a printer with a printing block placed on its printing plate, the surface of the characters adjusted for printing conveniently projects over the surface of the printing block in the direction of the hammer. The type wheels may present digits and other symbols.

An embodiment of the object of the invention is schematically represented in the accompanying drawing, wherein:

FIG. 1 shows a schematical view of the dating device, with partial section, and

FIG. 2 shows, in a larger scale, a cross section of the dating device assembled on a printer.

The dating device shown in FIG. 1 comprises a frame 5 consisting of two side plates 1, 2, cross bars 3 and a handle 4. Two two-edged axles 6 are mounted in this frame 5. Their ends are provided with projecting parts 7 which engage into corresponding slits of the side plates 1, 2. Four type wheels 8 are assembled on each of these axles 6. In the embodiment shown the upper series serves for printing the day and the month, the lower one for printing the year.

Each type wheel 8 is provided with ten characters 9, the digits from 0 to 9. Each character 9 is separated from the others by a groove 10. Each type wheel 8 has an internal and external decagonal section.

In FIG. 2 the dating device is mounted in the schematically represented printer. The sole parts of the printer shown are the printing plate 12 with fixed printing block 13, the inking ribbon 14 and the printing hammer 15. The dating device is retained by the bent edge 16 of the side plate 1, which engages in a groove 17 of the printing plate 12, as seen in FIG. 2, and by the cooperation of the two side plates 1 and 2 with the side walls of an aperture formed in the printing plate 12, the aperture being formed by the two side walls and a back plate 18 perpendicular to the two side walls. The whole is constructed in such a manner that the surface of the types of the type wheels 8 being in printing position project a little over the surface of the printing block 13. The surface of the opposite types does not touch the back plate 18 of the printing plate 12, but is at a distance from it. As is apparent from FIG. 2, the groove 17 has a sufficient width to allow the bent edge 16 and along with it the entire dating device to slide towards the back plate 18 to enable the types on type wheels 8 facing the back plate 18 to contact the plate 18 during the printing process.

The operating principle of the device described is the following: during the printing of the date the printing hammer 15 exercises, across the paper 19 and the inking ribbon 14 placed between the hammer itself and the dating device, a force on the latter, which deforms elastically the type wheels 8. The two-edged axles 6 do not absorb considerable forces, because these forces are transmitted to the printing plate 12 over the types op-

posite to those in printing position. The type wheels 8 are in contact with the support only when they have to transmit forces.

In order to adjust the type wheels 8, the dating device is withdrawn from the printer and the type wheels 8 are rotated e.g., by means of a pin engaging in the groove 10. By this they are also elastically deformed, because, as they are gliding over the edges of the axle 6, the distance of two opposite surfaces of the internal decagon is enlarged.

The device described has numerous advantages. The dating device forms an independent unit which can be adjusted outside the printer and then inserted in it; if the requirements for the printer change, with subsequent changes in paper size or format of the adjusted date, another dating device may be used, without redesigning the printer. Furthermore, the larger tolerances for the type wheels are advantageous: if the printing force is absorbed by the axle or axles of the type wheels, both the type wheels and the axles have to be manufactured with very small tolerances, because the types are in contact with the support from the beginning. In the device described, the contact with the support is generated by the printing process itself, and the type wheels being elastic, relatively large tolerances for the diameters of the type wheels are admissible. For this reason it is easy to insert the dating device.

For the sake of simplicity, the embodiment has been represented as a dating device with type wheels which are provided with only ten digits. Practically the type wheels can be provided with more than ten characters. In some cases this is even necessary. There exist for instance legal instructions which require, that in the case one number — date or weight — is not printed, a filler symbol, e.g., of an asterisk or a dash, is printed. In other cases, e.g., for perishable goods, besides the date, the indication "morning" or "afternoon" should be made. For this the letters "am" and "pm" can be used. Thus, in other embodiments, further type wheels with alphanumeric or graphic symbols might be used. Type wheels with the ten digits 0 to 9 and other symbols could also be provided.

I claim:

1. A printer, comprising: a printing plate having a plurality of sides forming an aperture extending from a front face of said plate a predetermined distance into said plate to one of said sides which substantially parallel to said front face, and a groove extending along another of said sides; a dating device, detachably connected inside said aperture to said printing plate, including a frame having means which is slidably engaged in said groove to slide backward and forward between said front face and said one side, an axle connected to said frame having a polygonal cross-section with two opposite first edges, type wheels, of an elastically deformable material, each having a polygonal inner cross-section with a plurality of second edges spaced apart by a plurality of sides, said wheels being rotatably mounted on said axle and in which two of said second edges of said wheels rest on said two opposite first edges of said axle, the distance between said two opposite first edges being greater than the distance between any two opposite sides of said polygonal inner cross-section, wherein when said wheels are rotated on said axle said inner cross-section is deformed by one of said two opposite first edges; and a movable hammer, located opposite said front face of said printing plate, for applying a force to said dating device; said dating device further including types on the periphery of said type wheels, some of said types being in a printing position facing said hammer and projecting ahead of said front face in a direction towards said hammer, and types on said type wheels opposite said types in the printing position being at a predetermined distance from said one side of said printing plate forming said aperture, wherein when said hammer applies a force to said types in the printing position said frame slides in said groove to enable said types opposite those in the printing position to contact said one side of said printing plate.

2. A printer according to claim 1 further comprising a printing block connected to said front face of said printing plate, and wherein said types in the printing position project ahead of said printing block in the direction towards said hammer.

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