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TAB MARKING MACHINE

Otto B. Meyers, Quakertown, Pa., assignor to Markem Machine Company, Keene, N. H., a corporation of New Hampshire

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This invention relates to marking machines of the type having a printing head movable toward and from a work-supporting platen and equipped with type-carrying members adapted to make the same printed impression at each operation of the type-head; and also equipped with other type-carrying members arranged to make a different printed impression at each operation of the printing head.

One of the uses to which marking machines of this type are put is the marking of tags such as are used in connection with certain manufacturing operations, such, for instance, as the manufacture of shoes or clothing.

In these manufacturing operations, it is customary to use a tag which is associated with each article or group of articles being manufactured and which progresses with the article or group of articles through the various manufacturing operations. These tags are of considerable length and are divided transversely into sections, there being one section for each operation that is performed on the article during its manufacture. Each section of the tag may have printed thereon some data which identifies the article and some other data which relates to the particular manufacturing operation corresponding to said section of the tag.

The printed matter on such a tag will, therefore, comprise one or more columns containing a plurality of identical printed impressions, and another column or columns containing a plurality of printed impressions, each of which is different from the other printed impressions in the column.

The type-carrying members which are used in marking machines of this type are usually in the form of type wheels having type characters engraved or otherwise formed on their peripheries, such type-wheels being independently adjustable in the printing head to permit them to be set for printing any desired data.

To provide for making the different printed impressions in the column on the tag which relates to the separate manufacturing operations, the type members by which these different printed impressions are made are mounted so as to be stepped forward one step at each operation of the printing head.

It frequently happens that it is desirable to make a change in one or more of the printed impressions which relate to the different manufacturing operations, and if the type characters for making these printed impressions are formed on a type-wheel, any change in any one impression involves removing the type wheels from the printing head and replacing them with other type wheels bearing the desired type characters for making the desired printed impression.

One of the objects of my invention is to provide a novel construction whereby the type characters can be readily removed from the type wheel so that any change in any individual type character can be made without the necessity of discarding one type wheel and replacing it by another.

According to this feature of my invention, the type characters for the type wheel or type member which is stepped forward one step at each operation of the printing head are removable from the type wheel or the type character as a group, and any individual type character of the group is also removable from the group and can be readily exchanged for another type character. Thus, any change in any individual type character can be made by removing the group of type characters from the type wheel or type member and then making the necessary change in the individual type members of the group.

Furthermore, since the type characters for any type wheel or type-carrying member are removable therefrom as a group, it is possible to exchange a group of type characters which is in use on the machine for another group having different type characters, thus making it possible to quickly change the machine over from one adapted to print tags of one type to a machine adapted to print tags of a different type.

In order to give an understanding of the invention, I have illustrated in the drawings some selected embodiments thereof which will now be described, after which the novel features will be pointed out in the appended claims.

In the drawings:

Fig. 1 is a side view of a tag-marking machine embodying my invention.
Fig. 2 is a front view of Fig. 1.
Fig. 3 is a view of the belt or ribbon of Fig. 1 on which the type members are mounted.
Fig. 3a is a perspective view illustrating the manner in which the ends of the type-carrying band may be connected and disconnected.
Fig. 3b is a section on the line X—X, Fig. 3.
Fig. 3c is a fragmentary sectional view showing the connected ends of the band in their connected relation.
Fig. 4 is a fragmentary sectional view showing a portion of the connected group of type members and one of the wheels by which it is carried.
Fig. 5 is a section on the line 5—5 Fig. 4.
Fig. 6 is a view of one of the type members detached from the belt or ribbon. Fig. 7 shows a type member having a different construction from that shown in Fig. 6. Figs. 8, 9 and 10 are views showing a different form which the type members may assume. Fig. 10a is a perspective view of one of the type members shown in Figs. 8 and 9.

Fig. 10b is a fragmentary perspective view of the retaining spring for said type members.

Fig. 11 is a fragmentary side view of a portion of a tag-marking machine having a different embodiment of the invention in which the group of connected type members are mounted on a wheel rather than on a band or ribbon.

Fig. 12 is a fragmentary front view, Fig. 11.

Fig. 13 is a side view of a type wheel having a group of movable type members mounted thereon.

Fig. 14 is a fragmentary sectional view on the line 14-14, Fig. 12.

Fig. 15 is a section on the line 15-15, Fig. 14.

Fig. 16 is a fragmentary sectional view showing the group of type members illustrated in Figs. 13 and 14, said type members being shown in 23 sections along the line 16-16, Fig. 15.

In Fig. 1 I have shown a tag marking machine having a printing head 1 which is carried by a rocking arm 2 pivoted to the frame 3 of the machine at 4, said head being movable toward and from the front portion 5 of the frame 3. The arm 2 may be given its rocking motion by any suitable means, and as herein shown, the end of the arm is connected by a link 7 to a crank pin 8 on a 35 crank disk 9 that is fast on a shaft 10. Said shaft is driven from a driving shaft 11 by means of a pinion 12 which is fast on the shaft 11 and which meshes with a gear 13 fast on the shaft 10. The shaft 11 may be driven by any suitable means, such as a driving pulley 14. In machines of this type, it is customary to provide some form of stop mechanism to bring the machine to rest when the printing head 1 is in its elevated position, and usually the machine is controlled by a treater which, when depressed, will release the stop mechanism so as to allow the machine to operate, said machine continuing the operation so long as the treater is maintained depressed but stopping with the printing head raised when the treater is released. Since the stop mechanism and treater are commonly used in machines of this type, it has not been thought necessary to illustrate them herein.

The machine illustrated is provided with a feeding roll 15 for feeding the type forward and also with means for stepping the feed roll 15 forward one step at each operation of the printing head 1, so that the tag which is being marked will be fed forward intermittently, thereby enabling the printing head to make repeated printed impressions on the tag. For this purpose, the feed roll is provided with a ratchet wheel 16 which is actuated by a feed pawl 18 carried by a link 17 which is attached, as shown, to the arm 19. When the rock wheel 16 is turned to its initial elevated position, the ratchet wheel 16, which is turned by the arm 19, is engaged by the ratchet 15, and the feed roll 15 is turned forward intermittently.

20 indicates a spring acting on the link 17 and yieldingly the arm 19 in engagement with the ratchet 15. 20 indicates a presser lever which acts on the tag and holds it in contact with the feed roll 15.

A machine of this general type is illustrated in U. S. Patent, 1,023,570, April 16, 1912.

The type-carrying elements with which the printing head 1 is equipped comprise a plurality of individually adjustable type wheels 21 that are mounted on a shaft 22 with which the type head is provided. These type wheels 21 may have any usual construction and are provided with peripheral prints of the type characters. Since the type wheels are individually adjustable, they may be set so as to make any desired printed impression within the limits of the type characters that they carry.

In printing a tag, the type wheels 21 will be set to print the desired data regarding the article being manufactured, and these type wheels will make the same printed impression on the tag at each operation of the printing head and will thereby print on the tag a column of identical printed impressions. The type-carrying member shown in Fig. 1, by which the printed impressions shown in Fig. 1, by which the printed impressions are made that are all different from each other are made, is in the form of a band or ribbon 23 carrying a plurality of type members 24, each type member having its own individual type character which is different from that of the other type members. This belt or ribbon 23 passes around and is supported by two wheels 25, 25 that are somewhat in the nature of sprocket wheels. The wheel 25 is mounted on the shaft 22 of the printing head and the wheel 26 is mounted on a shaft 27 carried by a link 28 that is pivotally mounted on a shaft 29 carried by two uprights 30 rising from and secured to the printing head 1.

By using a ribbon or belt 23 for supporting the type characters 24, it is possible to have a much larger number of type characters than could be used if the type characters were mounted directly on a type wheel such as a type wheel 21.

The wheel 25 is loosely mounted on the shaft 22 and has a ratchet wheel 31 fast therewith. This ratchet wheel cooperates with a feed pawl 29 and means are provided for giving the feed pawl 29 a forward step at each operation of the printing head 1 so that each time the printing head 1 makes its downward movement to produce a printed impression and returns to its initial elevated position, the wheel 25 will be steered forward one step, thereby advancing the endless chain of type members 24 one step. Since each type member 24 has a type character thereon which is different from that on any other type member, the result will be that each operation of the printing head 1, a different impression will be made by the type characters 24. The type wheels 21, however, will make the same printed impression at each operation of the printing head.

While any suitable means for actuating the feed pawl 29 may be employed, I have illustrated it as pivotally connected to an arm 32 fast on a rock shaft 31 carried by the uprights 33. This rock shaft has another arm 32 fast thereon which is pivotally connected to one end of a link 34, the other end of the link being connected to the arm 34 which supports the inking roll 35 for inking the type characters. This arm 34 is pivoted to the type head 35, and is connected by a link 36 to the upper end of a stationary upright 37. With this construction, the up-and-down movement of the printing head 1 will cause the inking roll 35 to travel back and forth across the type characters that are in printing position, thereby inking the type, and this swinging movement of the arm 34 serves to rock the
rock shaft 31 and thereby actuate the feed pawl 29. The type members 24 may be individually removable from the band or ribbon 23, and the ribbon 22 is readily removable from the wheels 25, 26 on which it is carried. This band 23 may be in the form of a flexible steel band and it is shown as formed with a plurality of apertures 33 in which the type members 24 are removably mounted. The type members shown in Figs. 4 to 6 each have the face 45 on which the type character is formed, and each has the extension 41 projecting from the back side thereof which projects through an opening 39 of the ribbon or band 23. The extension 41 is provided with a slot 42, the inner end 43 of which is widened thereby to provide the inwardly facing shoulders 44. The walls of the slot are beveled so as to provide a slot with a diverging mouth. The type members 24 are retained in the belt or band 23 by means of two wires 45 which underlie the shoulders 44 as shown best in Fig. 5. These wires extend along on the back side of the band 23 for the full length thereof and are anchored at their ends to the band, as shown at 46, 47 indicating hold-down members in the form of loops which embrace the wires 45 and retain them in position.

Since the wires 45 lie along the back side of the band 23, and underlie the shoulders 44, said wires serve to retain the type members in position on the band 23.

Any type member can be removed, however by moving the two wires toward each other at a point adjacent the type member which it is desired to remove until the wires are disengaged from the shoulders 44. This movement of the wires can be secured by means of a pair of tweezers or any similar implement.

Similarly, a type member can be attached to the band 23 by inserting the extension 41 thereof through an opening 39 in the band. As this is done, the inclined faces of the slot 42 will force the wires 45 toward each other, and as the type member is brought into position, the wires will snap under the shoulders 44 thereby locking the type member to the band 23.

The ends of the band 23 are adapted to be detachably secured together, thereby providing an endless band. For this purpose one end of the band is formed with an elongated aperture 48 having a dimension longitudinalwise of the band equal to the dimension of the type member 24 transversely of said band. To connect the ends of the band together, said ends will be brought into a position adjacent each other and then turned into a position at right angles to each other, as shown in Fig. 2a. The type member on one end of the band may then be inserted through the opening 48 in the other end thereof, and when this has been done, then the two ends of the band are swung around into alignment with each other. Said ends of the band will thus be locked together by the extension 41 of the type member which passes through apertures in both ends of the band.

The wheels 25 and 26 are each provided with a peripheral groove 50 to receive the extensions of the type members that project through the band 23 at the outer end of the groove being widened, as shown at 51, to receive the band 23.

Each wheel is thus provided with two flanges 52, one on each side of the groove 50, and there flanges are formed with recesses 53 adapted to receive the type member 24. The back side of each type member is beveled, as shown at 54, and the recesses 53 have the beveled faces 55 and are thus shaped to fit the back face of the type members. These recesses thus form seats in which the type members are received, as best seen in Fig. 4. These seats 55 also provide a firm backing for the particular type member which is in printing position during the printing operation so that the printing pressure is transmitted from the type member directly to the wheel 25, and the band 23 is relieved from any strain. In Fig. 7 I have shown a different form of type member which is indicated at 24a, and which is provided with an extension 41a adapted to be inserted in an opening 39 of the band 23. In this embodiment, the type member is held in place by wires which extend through apertures 55 in the extension 41a and which lie behind the band 23. With this arrangement, the type members 24a would not be individually removable from the band as is the case with the type members 24 shown in Fig. 6. In Figs. 8, 9 and 10, I have illustrated a construction wherein the band 23 is provided with a plurality of type holders, each of which carries several removable type members. These type holders are shown at 57, and the type members carried thereby are indicated at 58. The holder 57 is U-shape in cross section and is provided with a retaining rib 59 on the inner face of each leg. The type members 58 are each formed with a head 60 connected to the body of the type member by a neck portion 61. The type members are mounted in the holder by sliding the head 60 between the legs 61 of the holder 57 with the heads or ribs 58 occupying the grooves 62 of the type member and underlining the head 60. Each type member is formed with a face 63 which bears against the face of the holder 61. The type members 58 are retained in the holder 57 by means of a leaf spring 54, the ends 65 of which overlie the end faces of the end type members 58. These spring ends 65 are formed with ears 66 which overlie the end faces of the holder and thus serve to retain the spring in the holder and prevent it having any lengthwise movement.

By pressing the ends 65 of the spring backwardly, the type members may be released so that they can be removed from the holder, and when the holder has been filled with type members, the resiliency of the spring returns it to the operative position shown in Figs. 8 and 9, thereby locking the type members in the holder.

The holder 57 is shown as provided on its back face with an extension 57 which extends through the band 23, and each holder is anchored to the band 23 by two wires 68 which run longitudinally of the band and extend through apertures in the extension 61 of each holder.

In the construction shown in Fig. 2, there is illustrated two bands 23, each having a plurality of type members 24 thereon, each band having a set of wheels 25, 26 for supporting it. Each of the wheels 25 is provided with the feed ratchet 28 and each ratchet 28 has its feed pawl 29 for actuating it.

The band 23 with its type members 24 forms a chain of type members which can be of any desired length, and which contains many more type characters than would be possible to place on a type wheel such as the type wheel 21, thereby enlarging the capacity of the machine.

To provide for readily removing the chain of connected type members from the wheels, the arm 28 is shown as pivotally mounted on the shaft 69 carried by the uprights 99, and the outer end of said arm 28 is acted on by a spring 70.
which tends to hold the arm in the full line position shown in Fig. 1, thereby maintaining the band 23 in its dotted line position and vice versa comprises a lever 11 pivoted at 72 to the outer end of an arm 78 rigid with and extending from the upright 79, and a link 76 which is pivotally connected at 75 to the lever 71 and is pivotally connected at 76 to the arm 23. The portion of the lever between the pivotal connection 76 and its pivotal mounting 72 and the link 74 constitute a toggle device which is in a broken condition when the extension member is in the full line position shown in Fig. 1. When the lever 71 is swung forwardly into the dotted line position, Fig. 1, the toggle will be straightened thereby swinging the rear end of the arm 23 upwardly and moving the wheel 26 downwardly into the dotted line position. The straightened toggle serves to hold the arm 23 in its dotted line position against the action of the spring 70, thereby facilitating the removal of the band 23 from the wheels 26, 28, or its replacement thereon.

The wheels 26 are each shown as having a hand wheel 81 rigid therewith by which they may be turned manually. These hand wheels 81 provide means for adjusting the type bands 23 manually so as to bring any desired type into printing position.

In Figs. 11 to 16, I have shown an embodiment of the invention wherein the chain of connected type members are carried by a wheel instead of by a band or ribbon. This wheel is shown at 77 and is mounted on the shaft 22 coaxial with the type wheels 21. The individual type members which are connected as a chain and are carried by the wheel 77 are indicated at 78. Each type member is formed with a face 79 carrying the type character and with a stem or extension 80 which is adapted to be received in a groove 81 with which the wheel 77 is provided. These individual type members are strung on two coil springs 82 which extend through apertures 83 formed in the extensions 83. The two ends of each spring are anchored to the two end type members 78a and 78b of the chain of type members. The springs may be anchored to these type members in any approved way, and as shown in Fig. 16, one end of each spring is permanently connected to the shank of a screw 84 mounted in the type member 78b and the other end of each spring is permanently connected to the shank of a bolt 85 which is carried by the type member 78a.

The wheel 71 is provided in its periphery with notches 85 in which the type members 78 are received and by which they are positioned. The two notches 85a for receiving the end type members 78a and 78b are somewhat deeper than the other notches, as shown in Fig. 15, and thereby to provide a sufficient anchorage for these type members 78a, 78b. When the type members are on the wheel, the springs 82 are stretched somewhat and the tension of these springs serves to hold the type members firmly in their notches 85.

The chain of type members can be removed from the type wheel by simply removing either type member 78a, or 78b from its notch 85a, and then peeling the chain of connected type members off from the wheel, as shown in dotted lines, Fig. 13.

The type wheel 71 is provided with a ratchet wheel 88 which cooperates with the pawl 29 for stepping the wheel 71 forward one step for each operation of the printing head.

I claim:

1. A printing head for a marking machine having a flexible type-carrying band provided with a plurality of apertures, the plurality of separate type members each having an extension projecting through an aperture of the band, and means cooperating with and common to all said extensions for securing the type members to the band.

2. A printing head for marking machines having a flexible type-carrying band, two band-supporting wheels around which the band passes, said band having apertures therethrough, a plurality of type members, each having an extension projecting through an aperture of the band, and a retaining wire extending longitudinally of the band at the back side thereof and cooperating with said extensions for securing the type members to the band.

3. A printing head for a marking machine having a flexible type-carrying band, two band-supporting wheels around which the band passes, said band having apertures therethrough, a plurality of type members, each having a forked extension projecting through an aperture of the band with each arm of the fork formed with an inwardly facing shoulder, and retaining wires extending longitudinally of the band and engaging said shoulders, thereby to detachably secure the type members to the band.

4. A printing head for marking machines comprising a supporting member, a flexible type-carrying band, two band-supporting wheels mounted on said member and around which the band passes, means to rotate one of said wheels, and a plurality of type members separate from the band and removable carried thereby, each wheel having a circumferential groove in which the band is received and also having peripheral notches at the side of the groove to receive the type members, whereby said type members and notches provide a driving connection between the driven wheel and the band.

5. A printing head for marking machines comprising a vibratable member, a flexible type-carrying band, two band-supporting wheels mounted on said member and around which the band passes, means to rotate one of said wheels, and a plurality of type members separate from the band and removable carried thereby, each wheel having a circumferential groove to receive a band and also having peripheral notches at the side of the groove to receive the type members, whereby said type members and notches provide
a driving connection between the driven wheel and the band, the mounting for said wheels having means for moving the wheels toward each other to permit the band and its type members to be removed as a unit from the band-carrying wheels.

6. A marking machine having a supporting member, a band-carrying wheel rotatably mounted thereon, a second band-carrying wheel mounted on said member and adapted for movement toward and from the first-named wheel, a flexible type-carrying band passing around said wheels, a plurality of type members carried by said band, means for giving the first-named wheel an intermittent rotary motion, a spring means acting on the second-named wheel and tending to move it away from the first-named wheel, whereby said band is held in a taut condition, and a toggle lever device for moving said second wheel toward the first wheel against the action of the spring means and locking it in such position, thereby providing for removing the band from the supporting wheels or replacing it thereon.

7. A marking machine comprising a supporting member having an upright rising therefrom, a band-carrying wheel rotatably mounted on said member, an arm pivotally mounted on said upright, a second band-carrying wheel mounted on the arm, a type-carrying band passing around said wheels, a plurality of type members carried by the band, a spring acting on said arm and tending to move the type wheels away from each other, thereby maintaining the band in a taut condition, and a toggle lever device connected to said arm and by which it may be turned about its pivot to move the wheel carried thereby toward the other wheel against the action of the spring and by which said arm is held in such position, thereby providing for removing the band from the wheels or replacing it thereon.

8. A marking machine comprising a printing head, a flexible ribbon-like type-carrying band provided with a plurality of apertures, two band-carrying wheels mounted on said printing head and around which the band passes, a plurality of type members adapted to rest against one face of the band, each type member having an extension extending through an aperture in the band, and a retaining wire extending longitudinally of the band and cooperating with the extensions to hold the type members in position, said band having at one end an aperture of a size to receive the type member on the other end of the band, whereby the ends of the band can be connected or disconnected by inserting said end type member through or withdrawing it from said end aperture.

OTTO B. MEYERS.