Sept. 26, 1961 R. W. RICE, JR 3,001,628

PRINTING MECHANISM

Filed Oct. 27, 1960

FIG. 1

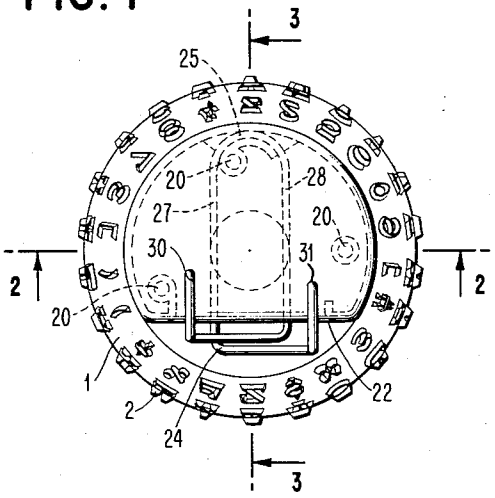


FIG. 2

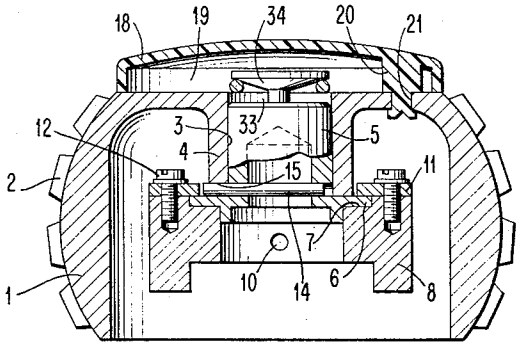
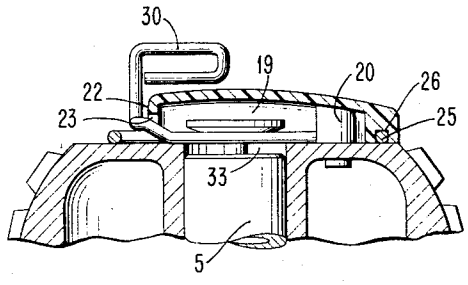


FIG. 3



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PRINTING MECHANISM

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This invention relates to printing mechanisms, and more particularly to printing heads having means for removably attaching them to a drive member.

In Patent No. 2,895,584 to J. E. Hickerson et al. there is shown a print head having characters formed on its surface to effect printing when engaged with a platen. The head is in the form of a truncated sphere and has the characters arranged in rows and columns on the spherical portion of its surface. By rotating the head on a supporting block while the latter is tilted about a horizontal axis, any one of the characters may be moved to a printing position. It is desirable that the head be held on the block by means which may be easily released to permit replacement of the head by another bearing a different style of character.

An object of this invention is to provide an improved print head having means attached thereto for releasably securing it to a drive member.

Another object is to provide a print head having a spring element which operatively engages a drive member for holding the head in driving engagement therewith, the spring element being operable by opposite counterbalancing forces for releasing it from the drive member.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

FIG. 1 is a plan view of the improved print head with the attached spring element securing it to a drive member.

FIG. 2 is an enlarged vertical sectional view taken on the plane of the line 2—2 in FIG. 1.

FIG. 3 is an enlarged vertical sectional view showing a portion of the head and its attaching means, the view being taken on the plane of the line 3—3 in FIG. 1.

As shown by the drawings, a print head 1 in the form of a truncated spherical shell has characters 2 on its surface for engagement with a platen, not shown, to effect printing. The lower end of the head is open so a driving mechanism may be extended into its interior and yet permit a tilting of the head about its center without interference. The upper end of the head is closed except for an opening 3 extending axially through its upper surface and through a sleeve shaped portion 4 projecting into its interior. A drive member 5 fits within the opening 3 and has a flange 6 resting upon a shoulder 7 on a supporting block 8 pivoted at 10 for tilting motion about a horizontal axis. An annular plate 11 is connected to the top of the block by screws 12 and overlies the flange 6 for holding the member 5 in place during tilting and yet permitting rotation of the member 5 relative to the block.

The lower end of the sleeve shaped portion 4 rests upon the flange 6, and a pin 14 extends through openings in the member 5 and a notch 15 in the lower end of the sleeve portion for connecting the head to the member 5 for rotation therewith. As shown by the Hickerson et al. patent, a forked member engages the pin 14 for rotating the member 5 and the head 1 while permitting a tilting of both with the supporting block.

Mounted on the top surface of the head is a cap 18 which may be molded from any suitable plastic material. The lower side of the cap is recessed so it provides between the cap and the head a chamber 19 into which the upper end of the drive member 5 projects. Formed integral with the cap are stud portions 20 which are reduced in cross section at their lower ends to extend through openings 21 in the upper surface of the head. After the cap has been mounted on the head with the stud portions extending through the openings 21, a heated instrument is applied to the lower ends of the stud portions for softening and deforming them in a manner to secure the cap firmly on the head.

The cap is generally circular in plan view to conform with the surface at the upper end of the head. A straight edge 22 is formed, however, on one side of the cap so a segmental portion to the head surface is exposed when the cap is mounted on it. The rim of the cap engages the head surface except along the straight portion 22. As shown in FIG. 3, a clearance 23 is provided between the cap and the head along the edge 22.

Arranged within the chamber 19 is a spring element 24 which is formed from a single elongated strip of spring material in the shape of wire. The element 24 has a bent portion 25 fitting loosely within a groove 26 (FIG. 3) molded in the cap. When the cap is mounted on the head the spring element is held by the head against escapement from the groove. Two arm portions 27 and 28 of the spring element extends from the bent portion 25 across the opening 3 and through the clearance 23. The outer ends of the arm portions are bent so they extend across each other and then project upwardly to form handle portions 30 and 31 which may be actuated manually to force the spring arms apart.

Formed in the drive member 5 adjacent its upper end is an annular groove 33 which is formed so as to provide on the member at the upper side of the groove a conical shaped surface 34. This surface slopes upwardly from the bottom of the groove to a level above the top of the head when the latter is resting on the flange 6. When mounting the head on the drive member, the handle portions of the spring element are pressed toward each other for spreading the spring arms so the upper end of the drive member may pass between them. After the head has been positioned on the flange 6, the handle portions are released so the spring arms flex toward each other and act between the surface 34 and the top of the head for forcing the latter downwardly against the flange. Removal of the head may be accomplished by simply pressing the handle portions toward each other and lifting the head from the drive member. It will be seen that the forces applied to the spring element while either mounting or dismounting the head counterbalance each other and place no strain on the driving connections.

While there have been shown and described the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that it may be modified and embodied in various other forms without departing from the spirit of the invention. It is intended to be limited only as indicated by the scope of the following claims.

What I claim is:

1. A single element print head comprising, in combination, a truncated spherical shell open at one end and closed at its other end except for an opening extending axially therethrough, characters formed on the spherical portion of said shell, a cap mounted on the closed end of said shell, a spring element arranged between said cap and said shell, said spring element having a spring arm normally flexing to a position overlying said opening, and a handle portion on said spring element adapted to be

actuated manually for forcing said spring arm to a position free of said opening.

2. A single element print head comprising, in combination, a truncated spherical shell open at one end and closed at its other end except for an opening extending axially therethrough, characters formed on the spherical surface portion of said shell, a cap attached to the closed end of said shell and forming between itself and said shell a chamber which is enclosed except for a clearance between said cap and said closed end at one side of said opening, a spring element having a portion secured between said cap and said closed end at the side of said opening opposite said clearance, said spring element having spring arms extending from its secured portion across said opening and through said clearance, and handle portions on said spring arms adapted to be actuated manually for forcing said spring arms to positions free of said opening.

3. A printing mechanism comprising, in combination, a truncated spherical shell open at one end and closed at its other end except for an opening extending axially therethorugh, a drive member received within said shell and having a surface on which said shell is supported, said drive member having a portion extending through said opening, an annular groove formed in said portion adjacent its upper end, a cap mounted on the closed end of said shell, a spring element secured between said cap and said shell, said spring element having a spring arm normally lying within said groove when said shell is mounted on said drive member, and a handle portion on said arm adapted to be actuated manually for forcing said arm to a position free of said groove.

No references cited.