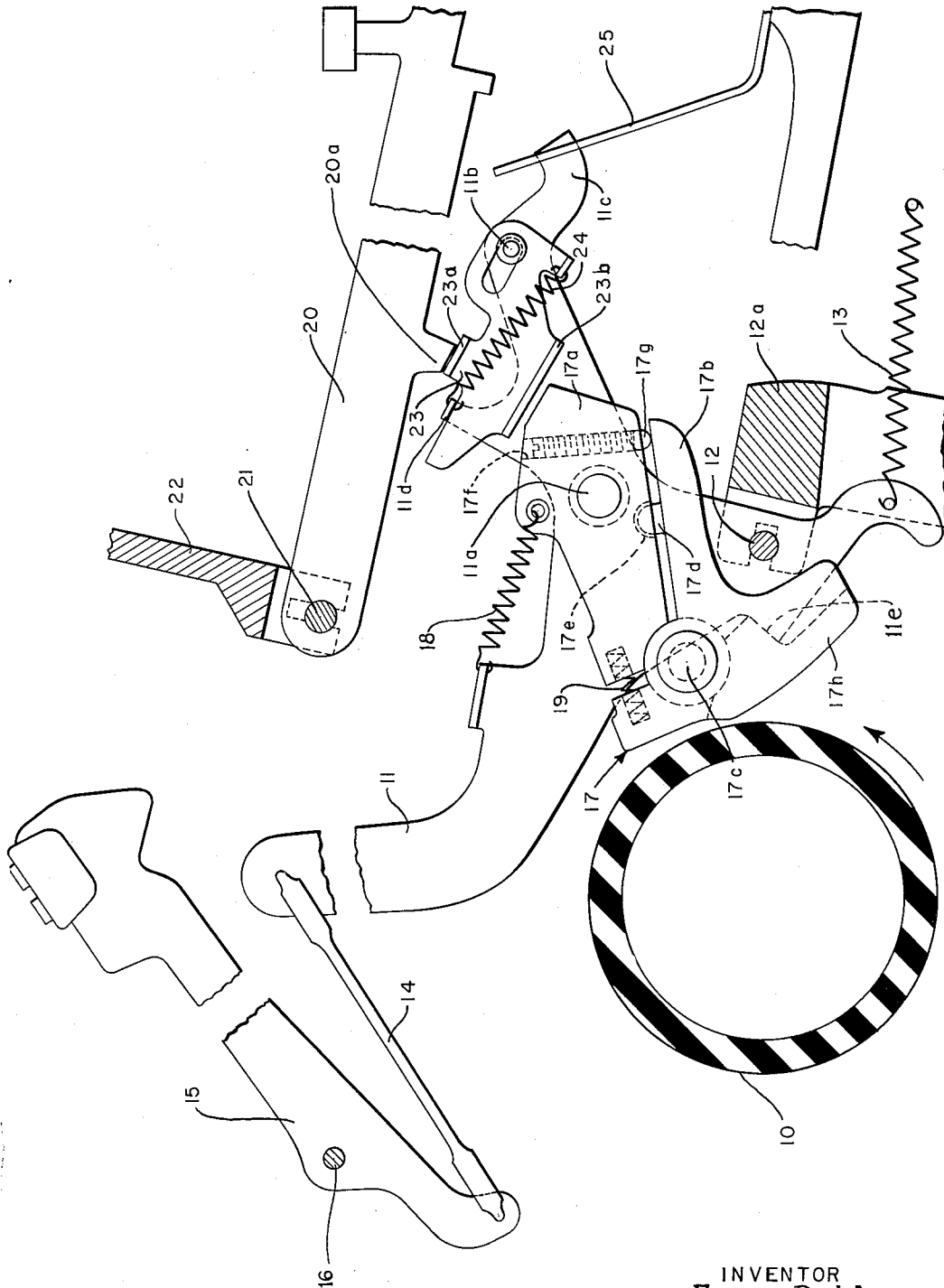


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ADJUSTABLE POWER OPERATING MECHANISM
FOR TYPEWRITING MACHINES
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ADJUSTABLE POWER OPERATING MECHANISM FOR TYPEWRITING MACHINES

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11 Claims. (Cl. 197—17)

This invention relates to typewriting machines.

The primary object of the present invention is to provide an improved power operating mechanism for typewriting machines.

An object is to provide a power operating mechanism in which the power mechanism is adjustable to more adequately match the power applied by the power mechanism to the load requirements of the type bar or other device.

An object is to provide a power mechanism for operating the type bars of a typewriting machine in which the power operating units or mechanisms which are individual to the type bars are readily adjustable in order that the impressions of different type bars on a work sheet may be made more uniform.

An object is to provide a simple adjusting means which requires very little additional mechanism over the structure of prior machines and in a comparative sense sometimes requires no additional parts.

An object is to provide improved power mechanism of the type disclosed in Patent 2,506,444.

An object is to improve the means of adjusting the blow of the type bars in a machine of the foregoing type.

An object is to provide a power operating mechanism for type bars in which a cam element cooperating with the power roller is provided with a means of changing the effective radius of a portion of the tread portion of the cam element with respect to the pivot for said element.

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

The drawing represents a vertical section through a power mechanism for typewriting machines embodying the herein disclosed invention.

Patent 2,506,444 discloses a power mechanism for typewriting machines in which each type bar is actuated by a power unit comprising a sublever connected to the type bar and a cam element pivotally mounted on the sublever which element has an eccentric tread portion designed for cooperation with a continually rotating power roller to effect a rocking motion of the sublever to thereby operate the type bar connected to the sublever. This patent discloses a means of adjusting the blow which contemplates positively disengaging the cam element from the power roller through the medium of adjustable fingers which have a camming action on the cam element.

While this mechanism works satisfactorily and is a practical means of adjusting the blow individually for each type bar, it has several disadvantages, one of which is the bulk of the additional parts required to effect the adjustment. Another objection is that there always is some rubbing action of the cam element on the power roller and a certain amount of additional loading of the

power unit at the time of disengagement, which does have some slight effect on the type bar, due to the additional power momentarily required to effect the positive disengagement of the cam element. The momentary rubbing action which takes place at the point of contact of the cam element and the power roller at the instant of disengagement causes a certain amount of wear of the power roller which is avoided in the mechanism disclosed hereinafter.

In the drawing there is disclosed a power roller 10 which rotates continually in the direction of the arrow while the machine is in operation. Cooperating with this power roller is a power unit which comprises an assembly of parts including a sublever 11 which is pivoted on a fulcrum wire 12 mounted in a suitable frame 12a supported by the main framework of the machine and has a restoring spring 13 attached to its lower end. The upper end of the sublever 11 is connected by a link 14 to a type bar 15. The latter is pivotally mounted on the usual curved fulcrum wire 16.

It will be understood that the type bar 15 is one of a cylindrical array of type bars mounted in the usual type basket which may be shiftable for case shifting purposes in a well known way, there being a power unit including a sublever 11 for each of the type bars such as 15.

The power unit includes also a coupling member such as a cam device collectively designated 17, which is composed of two main parts 17a and 17b of which the part 17a is pivoted at 11a on the sublever 11 and is urged in a counterclockwise direction by a spring 18 which is anchored to a lug formed in the sublever 11 and to an ear formed in the element 17a. The element 17b is pivoted to the element 17a at 17c and is urged in a counterclockwise direction relative to the element 17a by means of a spring 19 seated in axially aligned holes in the elements 17a, 17b. The elements 17a, 17b may be formed of a strong plastic material like nylon which has been employed with success for the cam elements of power mechanisms like the one disclosed in the above patent.

The element 17b is formed with a projection 17d which loosely enters a hole 17e formed in the element 17a to hold the element 17b in the plane of the element 17a. At this point, it should be explained that, due to the large number of type bars in a conventional typewriter, the power units must be made very thin, particularly when they are all mounted on a common fulcrum like the wire 12, so that the elements 17a, 17b necessarily must be thin and will have a certain inherent flexibility which makes it desirable that some means be provided for keeping these elements coplanar.

The element 17a is provided with a threaded bore 17f receiving an adjusting screw 17g which abuts the narrow arm of the element 17b. The latter is somewhat T-shaped in overall outline and, when assembled with the element 17a, comprises a somewhat L-shaped cam device which in outline and basic mode of operation is similar to the cam element 28 disclosed in the above patent.

Each of the power units is provided with a key designated 20 which is pivoted on a fulcrum rod 21 carried by a suitable subframe 22 mounted in the main framework of the machine. The key 20 is formed with a lug 20a which extends downwardly close to a lug 23a on an interposer element 23 pivotally slidably mounted at 11b on an extension 11c of the sublever 11. A spring 24, anchored to a lug formed in the interposer 23 and a lug 11d formed in the sublever 11, holds the interposer 23 in the position shown in the drawing with the upper left-hand end of the interposer against the lug 11d and with the spring 18 holding a recessed part of the part 17b of cam device 17a—17b against a surface 11e in sublever 11. Lug 23a on the interposer 23 cooperates with the lug 20a but there is a small clearance between the lugs 20a and 23b when

the key is in normal position. The extension 11c rides in a slot in a guide comb 25 suitably mounted in the frame-work.

The operation of the parts described above, in so far as the type bar is concerned, is generally similar to the operation of the mechanism disclosed in the above patent. When the key 20 is depressed, the lug 20a engages the interposer 23 and moves it downwardly thereby rocking the cam element assembly 17a—17b clockwise as a unit about the pivot 11a to engage the tread 17h with the periphery of the power roller 10. The lower right-hand end of the tread 17h has a greater radius of curvature with respect to the pivot 11a than the upper left-hand end of the tread with the result that rotation of the cam device 17a—17b by the power roller will cause the rocking of the sublever 11 clockwise on the pivot 12 in the same general fashion as in the above patent. This causes the type bar 15 to be operated and the force of the blow will depend on how far and how fast the type bar is positively driven by the power unit.

One theoretical limiting condition might be the case where the center of curvature of the tread 17h is everywhere concentric with the pivot 11a whereby no displacement of the sublever will take place while the other theoretical limiting condition is the one where the type bar is driven all of the way to the printing point by the power unit and cannot be operated any further because of slippage of the tread 17h on the power roller 10. Neither of these conditions is ever actually present but they are mentioned for the purpose of assisting in visualizing the effect of adjusting the element 17b relative to the element 17a.

Actually the parts will be usually constructed more or less as shown in the drawing in which the tread 17h, even with the minimum adjusting of screw 17g will have its center of curvature eccentric to pivot 11a so that a very material amount of motion of the sublever 11 will always be produced irrespective of the degree of adjustment of element 17b relative to element 17a.

It is clear from the drawing that rotation of the adjusting screw 17g in a direction to cause the element 17b to be rocked clockwise relative to element 17a will increase the effective radial distance of the lower end of the tread 17h from the pivot 11a and thereby will increase the extent to which the sublever 11 is positively moved by the above described rotation of the cam device 17a—17b by the power roller. Furthermore, increasing the angle which the tread 17h makes at the point of contact with the power roller 10 relative to a line drawn from said point of contact through the pivot 11 will cause the initial acceleration of the cam element 17a—17b to be increased so that the type bar will not only be actuated by the power roller through a greater angle, but will be initially actuated with increasingly greater acceleration as the cam element 17b is adjusted to increasingly greater extents clockwise relative to the element 17a.

The screws 17g are readily adjustable from above while the machine is standing on a flat surface since a screw driver may be readily inserted between the keys 20. This makes it possible to adjust the individual type bar operating mechanisms or power units not only more quickly but more accurately since the machine does not have to be repeatedly raised and set back on its base while the effect of the adjustment is observed by trial on a work sheet. One of the disadvantages of the arrangement shown in the above patent is that the studs 35 and lock nuts 35a there shown must be adjusted from underneath and the only practical way to do this is to tilt the machine on its back which makes adjustment of these parts somewhat tedious and tiring even when only one type bar has to be equalized as to uniformity of imprint with other type bars. This, of course, is likely to result in damage to the machine from repeated handling and the abrasion which is an inevitable consequence of standing the machine on its painted surface even when great care

is taken to protect the back of the machine with a relatively soft material.

One of the distinct advantages of the invention is that the number of additional parts which must be separately assembled in the machine in the process of general assembly is greatly reduced since the power unit comprising the sublever 11 and the cam device 17a—17b with associated parts may be assembled as a separate standard unit and this unit now comprises the adjusting means.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a typewriting machine, a type bar, a key for controlling the type bar, a power roller, and a cam device for operating the type bar having a cam element initially movable by said key into driving engagement with said roller and composed of a main body portion and an eccentric tread portion engageable with said power roller and adjustably mounted on said body portion to enable the eccentricity of said cam element to be varied.

2. In combination, a power roller, a sublever, a cam element rotatably mounted on said sub-lever and engageable with said power roller so as to be rotatable by said power roller, said cam element having a body portion pivoted on said sub-lever and a tread portion pivoted on said body portion; means for rotating said tread portion to adjust said tread portion eccentrically of the pivot for said body portion and means for rotating said cam element bodily on the pivot for said body portion to engage said tread portion with said roller.

3. In a typewriting machine, a type bar, a power roller, a character key; and power mechanism for operating said type bar under control of said key including a rotatable device having a tread portion eccentric to the axis of rotation of said device and initially rotatable by said key to engage said tread portion with said roller, said device including means to adjustably vary the eccentricity of said tread portion to said axis.

4. In a typewriting machine, a power roller, a power unit comprising a support member mounted for movement in a plane at right angles to said roller and a device rotatable on said support member by said roller and normally disengaged from said roller, said device having a tread member rotatable on a pivot eccentric to the axis of said device, the tread on said tread member normally having a variable degree of eccentricity relative to the axis of said device; means to adjust the degree of eccentricity of said tread member, and means to initially engage said tread with said roller for rotation of said device by said roller.

5. In a machine of the class described, a power roller; a power unit movable at an angle to said power roller and comprising a main support member having a connection to a device to be operated and a cam device rotatable on said member, said cam device including a tread member engageable with said roller for rotation thereby, and means to adjust said tread member eccentrically of the axis of rotation of said device; and means for initially engaging said tread member with said roller.

6. In a typewriting machine, a key, a type bar, a power roller, a sub-lever having an operating connection to the type bar and pivoted for movement at right angles to said power roller, a support arm pivoted to said lever, a tread member pivotally mounted on said arm and having a tread portion eccentric to the pivot axis of said arm to said lever and engageable with said power roller, means to adjustably rotate said tread mem-

ber to vary the degree of eccentricity of the tread member to said axis, and means enabling said key to rotate said arm to engage said tread member with said roller.

7. In a machine of the class described, a power roller, a part to be operated, an intermediate member movable toward and away from said roller; a rotatable coupling device mounted on said member and engageable with said roller for rotation by the latter, and when so rotated, actuating said intermediate member, said coupling device including a main body member and a tread member adjustably movable on said body member to control the extent of movement of said intermediate member through rotation of said device by said power roller.

8. A power operating mechanism for typewriting machines and the like comprising a power roller; a power unit including a rotatable coupling device engageable with the power roller for rotation by the latter and, when so rotated, causing the power unit to be displaced by said roller, and including means on said device to adjust the extent to which said unit is displaced; and means to engage said device with said power roller.

9. A power mechanism for typewriting machines and the like comprising a power roller; a power unit including a coupling device having a tread engageable with and rotatable by the power roller and, when so rotated, displacing said power unit an extent determined by the angle made by the tangents to the tread portion and said power roller at the point of contact, said device includ-

ing means to adjustably vary said angle; and means to engage said tread with said roller to render the power unit operable by the power roller.

10. In a machine of the class described, a power roller, a member to be operated by the power roller including a device rotatable on said member and engageable with the power roller for rotation by the latter until said rotatable device rolls free of said power roller, said rotatable device being composed of two parts one of which has an eccentric tread which engages the power roller and is movable relative to the other to adjust said tread eccentrically of the axis of rotation of said device, and means to engage said device with said power roller.

11. In a machine of the class described, a power mechanism including a roll-free cam device and a power roller for driving said cam device, said cam device having a tread portion rolling on said power roller when engaged therewith and having means to adjust the tread portion eccentrically.

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